

Teachers' stories of environmental education: blurred boundaries of professionalism, identity and curriculum

Se-young Hwang

A thesis submitted for the degree of Doctor of Philosophy

University of Bath

Department of Education

2008

Copyright

Attention is drawn to the fact that copyright rests with its author. This copy of the thesis has been supplied on condition that anyone who consults it is understood to recognize that its copyright rests with its author and that no quotation from the thesis and information derived from it may be published without the prior written consent of the author.

This thesis may be available for consultation with the University Library and may be photocopied or lent to other libraries for the purpose of consultation.

Signature _____

Table of Contents

Abstract	v
Acknowledgements.....	vi
Chapter 1. Introduction.....	1
1.1. The context of the study	2
1.1.1. On an educational response to environmental and sustainability issues	2
1.1.2. My background and research interest	8
1.2. The theoretical background of the study	9
1.2.1. Teachers' thinking and practice	10
1.2.2. Narrative inquiry	13
1.3. Summary of the methods of analysis	15
1.3.1. What stories, and how to interpret stories?	15
1.3.2. Structuring teachers' stories into three chapters	17
 Chapter 2. Literature review: framing the research discourse for teachers' 'environmental' 'education'	 18
2.1. Institutional development of school environmental education	19
2.1.1. International background.....	19
2.1.2. Policy intervention in Korea	23
2.2. Contextualising research on teachers' thinking and practice in environmental education	28
2.2.1. Teacher's thinking and practice	28
2.2.2. The Korean cultural and educational context.....	38
2.3. Toward research perspectives: two aspects of 'environmental' 'education'	45
2.3.1. Significance of teachers' life experiences.....	45
2.3.2. Significance of environmental knowledge and curriculum: focus on science.....	54
2.4. Proposal of research themes: teachers' experiences of 'environmental' 'education'	66
 Chapter 3. Narrative inquiry: theoretical perspectives for methodological framework	 68
3.1. Defining narrative inquiry for this study	69
3.1.1. Narrative inquiry as a study of meaning: an overview	69

3.1.2.	Rationales for narrative-discursive approaches.....	78
3.1.3.	Perspectives from environmental education research	87
3.2.	The role of narrative inquiry in education.....	91
3.2.1.	The review of narrative genres	91
3.2.2.	A genre of environmental education? Search for multiple spaces for narrative inquiry.	99
3.3.	Teacher narratives in this study: themes and concepts	106
3.3.1.	Teachers' life experiences	106
3.3.2.	Teacher voice and professional identity.....	112
3.3.3.	Environmental knowledge and curriculum	116
Chapter 4. Developing teachers' stories and methods of analysis.....		120
4.1.	Searching for teachers	121
4.1.1.	Who are "environmental education teachers"?	121
4.1.2.	Eleven teachers in this study	124
4.2.	(Re)searching for teachers' stories.....	129
4.2.1.	Weaving 'environmental', 'education', and 'stories'	129
4.2.2.	Reading cultural histories through personal narratives	137
4.3.	Issues of representation and quality	143
4.3.1.	Reflexivity in interview and interpretation process	143
4.3.2.	Writing as a method of inquiry	148
4.4.	Developing methods of analysis	151
4.4.1.	Making the cases for three research themes	151
4.4.2.	Beyond personal narrative: making links to other sources of teacher narratives.....	157
Chapter 5. An introduction to teachers' stories of vision: blurring personal and professional identities		166
5.1.	Emplotting a vision	166
5.2.	Making sense of vision: five teachers' life stories	168
5.3.	Stories of vision and 'environmental education teacher' identities	185
5.4.	Understanding teachers' meaningful stories	189
Chapter 6. Arguing for teacher professionalism: good teacher or odd teacher?		194
6.1.	Argumentative narratives and professional identity construction.....	195
6.1.1.	Argumentative feature in identity talk.....	195

6.1.2. Reading ambivalence.....	199
6.2. Arguing for teacher professionalism.....	202
6.2.1. Good teacher or odd teacher? (five science teachers' stories).....	202
6.2.2. Wearing an 'environmental' badge (two humanity teachers' stories).....	215
6.2.3. Beyond survival (Environment teachers' stories).....	219
6.3. Environmental education teacher identities and teacher agency.....	229
Chapter 7. In search of curriculum repertoires: teaching under contingency and complexity ..	234
7.1. Perspectives on curriculum repertoire.....	235
7.1.1. Environmental education as an act of repertoire-making	235
7.1.2. Cultural mediation in repertoire-making	238
7.2. Six curriculum narratives as teachers' repertoires	240
7.3. Teaching under conditions of contingency and complexity	258
Chapter 8. Summary and discussion	265
8.1. Summary and reflection	265
8.1.1. Making sense of teachers' environmental education.....	265
8.1.2. Teacher narratives as action	269
8.2. Implications for teacher learning and narrative inquiry	272
8.2.1. Teacher narratives and learning.....	272
8.2.2. Environmental education as a catalyst for teacher learning.....	275
8.2.3. Agendas for narrative inquiry	279
BIBLIOGRAPHY	282
Appendix to Chapter 2	303
Appendix to Chapter 4	309

List of Figures

Figure 1-1	Making sense of teachers' environmental education	17
Figure 2-1	An ecological model of teachers' knowledge and beliefs (Hoy, Davies & Pape, 2006) .	47
Figure 2-2	Relationships between society, nature, learning and change (Scott & Gough, 2003, p.9) .	56
Figure 3-1	Hypothetical dimensions of teacher identities in relation to environmental education ..	113
Figure 4-1	The Cheonggyecheon at night.....	141
Figure 4-2	Making sense of teachers' stories (Han's case)	165

List of Tables

Table 2-1	Professional activities of The Korean Society for Environmental Education (Updated from Lee, 2006)	24
Table 2-2	Environmental Conservation Model Schools (Ministry of Environment, 2006, p.5)....	25
Table 2-3	The adoption rate of Environment subject (Ministry of Environment, 2006, p.4).....	26
Table 2-4	'Environment teacher' qualification rate, 2005 (Ministry of Environment, 2006, p.6) .	27
Table 3-1	Terms/Forms and varieties of the biographical method (Denzin, 1989, pp.47-48)	73
Table 3-2	Elements and characteristics of teacher's narratives of (environmental) education.....	76
Table 3-3	Metaphysics of selected alternative narratologies (summarised from Boje <i>et al.</i> , 2002) ..	79
Table 3-4	Dramatism analysis of role and identity (Czrniawska, 1997, p.32)	113
Table 4-1	Teacher Profiles.....	125
Table 4-2	Six themes of teacher narratives	137
Table 4-3	Two discussions on teachers' stories.....	159
Table 4-4	Samples of newspaper coverage on school environmental education in Korea.....	161
Table 4-5	Story elements in exemplary teaching	163
Table 4-6	Linking personal narratives to other narratives of teachers.....	164
Table 7-1	Story elements of curricular repertoires	240
Table 7-2	A summary of the portrayal of exemplary science teachers (KICE, 2002)	261

Abstract

This study uses narrative inquiry to contribute to ways of valuing and utilising teachers' personal narratives as tools for understanding their thinking and knowing in relation to the environment and environmental education, and for critically examining and challenging dominant narratives and discourses of education and the environment in school education. The research develops teachers' stories as the main focus of inquiry and data, with the understanding that teachers' stories articulate the dynamics and interactions between discourses and practices that constitute teachers' thinking and experiences of environmental education. Based on life-historical and focus group interviews with eleven secondary school teachers in Korea, the inquiry also develops novel ways of understanding and analysing teacher narratives about environmental education, in three parts.

As an introductory part of the analysis, five teachers' short stories are presented via framings of their plots ("vision") and key narrative themes, with a focus on the teacher's own ways of making sense of their environment-related experiences through blurring the boundaries of personal and professional identities. Two subsequent chapters develop a critical investigation into their discursive practices, illustrating the blurring of boundaries in professionalism and curriculum, through which the teachers' environmental education can create cracks and ruptures in school education. Narrative analysis of three teacher groups – science, humanities, and environment teachers - contributes to an examination of the tensions in arguing for 'environmental education teachers' professionalism within the institutional context of schooling in Korea. Finally, analysis of teachers' curriculum repertoires, via six topics – alternative energy, environmental issues, health and 'well-being', biotechnology issues, outdoor education, and green education - provides an examination of the contingencies and complexities in the processes of teachers' pedagogical rendering of cultural narratives of science and environmental issues.

The study utilises narrative-discursive approaches to teachers' thinking and practice. Teacher narratives are located alongside other narratives of teachers, to elucidate the meanings of personal narratives as 'small' stories and explore their role in critiquing surrounding, 'larger' institutional and cultural narratives, including hero and exemplary teacher discourses, by opening up discursive spaces for alternative meanings of professionalism and curriculum. The study also includes a discussion of how teacher learning can be understood and facilitated by using teacher narratives as vehicles for examining the nature of teacher action, and in so doing, argues that school environmental education can be a catalyst for such teacher learning.

Acknowledgements

It is a pleasure to thank the many people who made this thesis possible.

I would like to express my gratitude to my supervisor Dr. Alan Reid for his enthusiasm and support, with which I could genuinely enjoy the process of doing Ph.D project, and Prof. Bill Scott, whose support enabled to turn my research interest into a doctoral research. I am grateful to the Department of Education at University of Bath for the studentship.

My special thanks go to Prof. Paul Hart and Dr. Ann Childs for their examination of the thesis, and Dr. Jutta Nickel, Dr. Kelly Temmy, and Dr. Nam-soo Kim for their helpful comments on the thesis.

I also thank my friends in Bath – Asimina, Junko, Susanne, Michelle, Grace, Ruyu, and Emily, for their support and friendship, with whom I have shared struggles and joys of the life in Bath.

I cannot end without thanking my family – mom, dad, and sister, on whose unconditional support and love I have relied throughout my time in England.

We are living through bewildering times where the conduct of education is concerned. There are deep problems that stem from many origins – principally from a changing society whose future shape we cannot foresee and for which it is difficult to prepare a new generation. [...] For at the heart of any social change one often finds fundamental changes in regard to our conceptions of knowledge and thought and learning, changes whose fulfilment is impeded and distorted by the way in which we talk about the world and think about it in the coin of that talk.

-Bruner, "Actual Minds, Possible Worlds", 1986, p.121-

Chapter 1. Introduction

❖ An overview of the thesis

The thesis:

This thesis provides an analysis of the phenomena of school environmental education in Korea based on the methodological framework of narrative inquiry, with a focus on the contribution of teachers' environmental education to educational practice. The study investigates the role of school education in dealing with environmental and sustainability issues, by developing theoretical and empirical understandings regarding questions of:

- How can teacher narratives be developed in ways that represent teachers' ways of making sense of their environment-related experiences *and* enable a critical examination of institutional and cultural narratives of the environment, education, and environmental education?
- How does teachers' environmental education contribute to educational practice?

The phenomena under investigation:

The focus of the inquiry is teachers' thinking and practice in Korean secondary schools, and their interpretation(s) of environmental education. The purpose of the study is not directly concerned with a comprehensive overview of environmental education in Korea. Instead, it is to understand the phenomena of environmental education through teachers' experiences, as composed of different discourses and practices, and therefore, to examine the role of teacher narratives in addressing critical issues about teacher professionalism.

The term 'environmental education':

In understanding teachers' stories, the thesis focuses on the ways in which teachers make sense of their environment-related experiences, therefore, the term 'environmental education' is necessarily viewed from the perspective of teachers' preferred ways of conceptualising what they engage in. Yet the term is also used to broadly refer to discourses and practices related to environmental and sustainability issues including more institutionalised versions of the discourse, such as international and national policy discourse and mandated school curriculum foci termed Environmental Education (EE) and Education for Sustainable Development (ESD).

Methods of data collection:

To generate teachers' stories about their environmental education, interviews were conducted with eleven Korean secondary school teachers who are engaging in environmental education in their own ways and contexts. They are five science teachers, two humanities teachers and four 'Environment' teachers – teachers who teach an optional environmental curriculum. For the purpose of narrative inquiry into teachers' stories, other verbal and written sources of teacher narratives were collected.

In the following, the opening part of the thesis provides an account of the research questions and an overview of the key themes and theoretical perspectives under investigation.

1.1. The context of the study

This section introduces the fundamental questions and research interests that underpinned the study's inquiries into teachers' environmental education.

1.1.1. On an educational response to environmental and sustainability issues

What is the role of education in dealing with environmental and sustainability issues¹?

The conventional story can be summarised as follows: with pervasive and systemic environmental degradation becoming widely recognised over recent decades (e.g. as reported in the “*State of the World*”, published annually by the Worldwatch Institute), education must be charged with a prominent role in consciousness-raising and stimulating action to ameliorate negative changes and processes. When environmental education and a teacher's responsibility for it are conceptualised in this situation, a key motif, as crystallised by Schumacher (1973), is that education is ‘the greatest

¹ The phrase of ‘environmental and sustainability issues’, by broadly referring to the related phenomena, discourses, and practices, denotes no subscription to one particular discourse, theory, or research perspective such as ‘sustainable development’.

resource' we have to solve environmental problems, or as *Connect* (UNESCO-UNEP, 1989, p.1), the UN's mouthpiece for environmental education, puts it:

Environmental education at all levels for all people is crucial: the more knowledge the public has about the environment, the better, the more rapid and more effective decision makers can be, and will be. Furthermore, environmental education is the cornerstone of long-term environmental strategies for:

- presenting environmental problems
- solving those which arise or have occurred; and
- assuring environmentally sound, sustainable development.

Such rhetoric is found in the many tales of environmental education that work at 'grand' scales through international initiatives, for example, *The Belgrade Charter* (UNESCO-UNEP, 1976), *The Tbilisi Declaration* (UNESCO-UNEP, 1978), *Agenda 21* (UNCED, 1992), and most recently, the *UN Decade of Education for Sustainable Development (2005-2014)* (UNESCO, 2003). At the same time, global environmental concerns such as climate change appear more challenging than ever. On the one hand, their impact and unpredictability are paradoxically more certain, on the other, there is both faith in and doubt about our responsive and anticipatory capacities toward environmental challenges, and in particular, the purposes and processes of building capacity through education, locally and globally, i.e. by what means, and to which ends?

"*Greenspeak*" (Harré, Brockmeier & Mühlhäser, 1999) was one of the first major studies to alert us to both the alarmist and authoritative tones of voice that environmentalists and contrarians seek to use amid the recognition and talk of a global crisis and the call for sustainability oriented thinking and action. Indeed, global environmental issues have become popular stories through their amplification and campaigns as mobilised by the media (e.g. Al Gore's film, "*An Inconvenient Truth*", 2006), and the role and authoritativeness of a science discourse appear crucial to making stories appear more powerful in talk and debate about the 'truth' and 'solutions'.

Whilst such environmentally-focused narratives may provide a strong societal momentum for institutionalising and legitimatising the role of education and promoting educational approaches to environmental concerns through the international and national policy interventions such as the aforementioned initiatives, they are not without their problems. Behaviourist and instrumentalist discourses on the role of education have also become the very predicament for educationalists whose concerns are not so much about doing as being 'told' to do so (e.g. by the media, science, or even educational policies), and this can obviate opportunities to pursue and articulate critical

‘readings’ of those narratives and discourses from the different, competing perspectives expected of effective pedagogical situations, practices and scenarios (e.g. Scott & Gough, 2003).

Moreover, from the brief discussion so far, a science educator may face the task of reconsidering previous pedagogical approaches in order to encourage teaching and learning that critically examines the usefulness and constraints of the ‘truth’ and ‘solutions’, given the temporal and spatial scale of the changes in nature and the environment that may lie beyond our current intellectual capacities, e.g. in relation to contemporary scientific tools and understandings, and to better engage with the issues of uncertainty and risk that the scientific discourse of environmental and sustainability issues entails. Indeed, when the inquirer’s pedagogical accent shifts from telling and finding the truth in such a way, an emerging issue is what are other and new ways of pursuing pedagogical and educational truth?

Thus, in focusing on the search for educational possibilities and sensibilities by reading and interpreting critically the phenomena related to environmental and sustainability issues, this study sets out to address the issue by examining the phenomena of environmental education as representing the various ways of and routes for such searches, including broaching the very fundamental question of the current and future role of education in these matters.

Environmental education that creates cracks and ruptures in school education

My main assumption in this study about the phenomena of school ‘environmental education’ is that they are composed of and by multiple discourses, practices and interpretations about the role of education in dealing with environmental and sustainability issues. In this, for the sake of argument, it is possible to identify two different types of discourses. The first might be called “Environmental Education”. This denotes a more institutionalised discourse that categorises the normative ways of thinking and practice through formal mechanisms, such as mandated curricular topics, categories, and approaches. The second is small “environmental education(s)” that have not yet been well defined or lie beyond more conventional ways of thinking about and implementing education, and are hence marginalised or emerging. The relationship between two discourses will be loose and culture bound. Also, some may see more recently popularised discourse of Education for Sustainable Development (ESD) as replacing the old ‘Environmental Education’, whereas others may not (Hesselink, van Kempen & Wals, 2000; Wals & Jickling, 2000).

In contrast, the idea of ‘environmental education’ is concerned with teachers’ interpretive practices of various ideas and perspectives concerning ‘education’ and the ‘environment’, including the discourse of ‘Environmental Education’, and their personal and pedagogical interpretations. Therefore, the term ‘environmental education’ may not be relevant to a teacher’s own conception of what he or she is up to, or become problematic given the personal, social and cultural construction of ‘Environmental Education’. It is assumed that teachers’ interpretations are ‘small’ in the sense that they are less systematised and standardised than the dominant discourse, and deeply grounded in the individual teachers’ own contexts of learning and action, therefore teachers’ knowledge and values are composed through blurrings, mixings, and contestations of elements of their personal and professional contexts. While it is still important to recognise diverse conceptions of ‘environmental education’, the study’s primary focus lies with developing research inquiries that are able to identify explicit as well as implicit and tacit characteristics of teachers’ thinking and practice.

Although arbitrary, the distinction between the two discourses suggests opportunities for a fresh perspective in thinking about the role of education, in that the distinction affords investigation of the dialectical relationship between the two in ways that can create discursive spaces about school education by pursuing the question of what is possible and the other meanings that can avail themselves. To develop such an inquiry, this study has focused on aspects of Korean teachers’ experiences of environmental education, knowing that their environmental concerns and pedagogical theories are grounded in their everyday life contexts and teaching practices as well as in official discourse.

In some sense, all eleven teachers’ experiences and practices go beyond the conventional notion of environmental education, through, for example, pushing the boundary of science education for addressing environmental and sustainability issues (science teachers); building environment-focused, not subject specialism-based teacher identities (humanities teachers); and seeking new teacher professionalism through an environment-focused subject (Environment teachers). However, provided that such ‘environmental education’ practices are neither taken-for-granted ways of teaching, nor familiar landscapes in the school education context in Korea, they are assumed to be windows into discursive practices that represent the dynamic interactions between two discourses of environmental education, rather than the sole arbiter for a new or alternative discourse of (environmental) education. Thus, the inquiries into these teachers’ thinking and practice have focused on those ‘small’ ‘environmental education(s)’ defined and espoused by teachers based on their own experiences and personal practical theories in ways that diversify the categories and definitions of teacher professionalism in a broader sense.

Investigations into small environmental education(s) then, do not presuppose that teachers' own ideas and approaches are necessarily good or exemplary educational practices. Instead, critical interpretive inquiry methods as adopted in this study illuminate aspects of teachers' thinking and practice of environmental education(s) in which conceptual and narrative connections between the ideas, values, or stories about the environment are made, remade or not made in the teachers' own sense making, in terms of pedagogical concerns and approaches. They are also used to show how such personally meaningful practices and actions, and the understanding of emerging topics concerning teachers' learning, identities, and curriculum development point to, or even challenge, the normative practice of teaching and learning. In so doing, the key purpose of these particular analyses of teachers' environmental education is to identify and conceptualise educative and learning opportunities and contexts for teachers or student teachers, to envisage their professional identities in ways that are critical of taken-for-granted norms and ways of thinking; hence, how environmental education may become conducive to teacher professionalism and educational practice in general?

Why do teachers engage in environmental education?

How then can an understanding of diverse environmental education discourses and practices from teachers' points of view contribute to the overcoming of an instrumentalist discourse of environmental education, and envisage educational sensibilities and support learning opportunities?

In the opening section, I spelled out briefly the 'conventional' story of environmental education that conveys a sense of urgency and responsibility by setting forth the need to take action, and in terms of education's role, implementation becomes the utmost priority. In the repertoire of the role of education then, stories of teachers are likely to be composed of the 'content' of teaching practice such as teacher knowledge and conceptions, with the storyline being concerned with how teachers' particular pedagogical ideas and approaches bring about (usually prescribed) desired outcomes of learning (see examples in 2.2.1). In fact, origins, contexts, and the processes that generate or underpin a multiplicity of 'content' of stories of teachers is a relatively recent development in the focus of inquiry.

It is important to note that this study grew out of an interest in examining what stories of teachers' engagement might otherwise be, and more crucially, other ways of telling such stories: that is, the study is also concerned with who gets to tell which stories, how, and why (e.g. Hart, 2003; Nikel,

2005). One area in which ‘untold’ stories have remained under-examined in the environmental education research field is in relation to notions of teachers’ motivation, passion, and commitment. Recognising this problem, asking teachers, “How did you come to be engaged in environmental education?” is to set out on a journey to understand the phenomena of school environmental education in Korea from the starting point of the teachers’ voices. But the assumptions that underpin this initial point of departure also require explication.

Teachers, pupils, or researchers do not typically ask teachers, “Why do you teach?” While this is problematical in its own terms, in relation to this study, we must also remember that environmental education does not offer a ‘given’ pedagogic role for all teachers. Doing environmental education in schools means different things to different teachers. Thus, within the realm of possibilities, my interest has been to know how teachers who are aware of their doing environmental education discuss their thinking and experiences, in spite of different ways of conceptualising what it is that they do, and that which they are engaged in. This entails undertaking inquiries that assume, for example, that teaching practice is likely to be constituted by matters beyond the boundary of a school institution, such as that *personal life experience* can then be included within the scope of what is legitimate as an object of inquiry for why teachers teach. That is to say, where teachers’ interests in and concern about ‘environment’, and their decisions to act upon this through teaching come from, are unlikely to be solely matters of - or traceable to - pedagogy, although further pedagogical processes should be the site where teachers’ reflection and competence can grow. Furthermore, asking “why” teachers engage in environmental education is grounded in an assumption that such an educational practice should be situated within a concern to understand *what teachers are up to, culturally, discursively, institutionally, and personally*, in thinking about and carrying out such education.

For the purposes of this study then, this requires that conceptions of ‘teaching’ are operationalised differently. It is expected that stories that teachers tell in relation to their environment-related experiences with a focus on matters of ‘why’ blur and challenge the boundary of teacher’s work and responsibilities. But then it might be questioned as to whether the stories of teachers who are engaged in environmental education can and should offer any normative values of participating in environmental education? For example, what would these stories mean to teachers who are not interested in addressing environmental and sustainability issues through their teaching, or are no longer interested in doing so (i.e. to acknowledge that career trajectories may have a bearing on the instances and duration of particular forms of practice)? While the study’s scope does not directly concern ways of mainstreaming environmental education into school education, as will be argued below (Chapter 6), research inquiry methods that focus on teachers’ voices and life experiences do

suggest that stories about teachers' environmental education offer critical insights into teaching and teacher professionalism by illustrating and questioning the origins and nature of teachers' reflective practice and ongoing struggles, and can invite them to think about possible and other ways of creating cracks and ruptures in the institutional and cultural processes that shape the meanings of teaching.

1.1.2. My background and research interest

Given the aforementioned research interests and purposes, meetings with teachers who are participating in environment-related teaching and environmental education were indispensable to this study. In fact, I have had a long-lasting interest and passion to know what motivates people to take responsibility and initiative in relation to environmental concerns. I recall meeting one woman who was working as an environmental educator at a local environmental non-governmental organisation (NGO) in Korea. We first met when I took part in an NGO programme, the purpose of which was to train future environmental educators. That was in 2000, and at the time I was a final year student at university studying biology education, and had then decided to pursue environment-related studies on a Masters programme. Participating in the training course was one way of getting to know about environmental education. I met her again in 2003 when I asked her for an interview for an assignment within a life history methods course. Three years later, she had become an enthusiastic and confident environmental educator.

Writing a life history about how she became an environmental educator was a stimulating and self-reflective process in that as I strove to understand her stories, I often found the self-same interview questions could be asked of me. Also, the process in which her unique interests in environmental concerns grew into professionalism and activism were imbued with a sense of transformation and identity formation through which particular life-changing decisions and ongoing learning experiences stood out, as the stories moved along different aspects of life and environmental experiences and identities, i.e. as a child with a working class background, as a housewife and mother, and as a professional outdoor educator. Through this, I became curious about the power of the stories that people tell about their lives. For example, the woman's life history seemed to have the power to tell some truth concerning an understanding of how a person's life becomes a continuous learning process in personally meaningful ways. But also importantly, culturally and historically situated, the person's stories could invoke a sense of sympathy and self-identification on the part of the reader. For research methods and data then, stories about 'environmental education' from an educator's perspective can seem to abound in accounts of rich learning

resources and action strategies that in some sense form, or represent, the foundations of personal professionalism including beliefs, values, and knowledge. Indeed, good stories, if generated through authentic and critical engagement, have the potential to illuminate educational sensibilities by viewing the phenomena and the discourses of ‘environmental education’ from a holistic perspective. That is, life stories can illuminate personal ways of making sense of experiences and interpreting meanings within the individuals’ own horizon of understanding about the world that not only reflect but also go beyond the propositions and predefined categories of values and norms that are socially and culturally imputed to individuals.

Embarking upon a PhD study, the research inquiries into eleven Korean teachers’ stories of their environment-related teaching and learning experiences were developed with such interests and assumptions on the value of stories. The ideas about narrative and identity were the main area under theoretical consideration for developing critical hermeneutic approaches to teacher narratives with a focus on teachers’ sense-making of ‘environment’, ‘science’, ‘education’, and ‘teaching’, and these are the main themes of literature review in the study. Undergoing empirical investigation were the phenomena of school environmental education in the Korean educational and cultural context, and these have become the central part of the research accounts. During the fieldwork phase, I became aware of the influence that my cultural identity of being expatriate could have in terms of the ways of collecting, reading, and interpreting the data. I took this as a spur to develop critical reflexivity throughout the inquiry and interpretation processes, not only in terms of ideas about cultural circumscription and relevance, e.g. Korean cultures, but also in the broader sense of the cultural processes that directed the PhD journey by shaping the very notion of the research ‘interest’ and ‘inquiries’. Therefore, the process of developing the research methods and analytic framework for narrative inquiries should be considered crucial for the developing thesis.

1.2. The theoretical background of the study

Having broadly set out my research questions and interests, this section summarises the theoretical background to the study. Chapters 2 and 3 provide a detailed account of the premises made in this section.

1.2.1. Teachers' thinking and practice

The field of environmental education research has been a key site for the discussion of the role of education in dealing with environmental and sustainability issues. In a recent special issue of *Environmental Education Research* (2007, vol. 13 (2)) on the possibility and practice of environmental education in schools, contributors argued that the gaps between policy discourse (i.e. 'Environmental Education') and practice in environmental education have remained significant over the past 20 years given little change in the institutions of schooling (Stevenson, 2007a, p.132).

While findings from the studies in the special issue illustrate the emerging and evolving features of practice and research relating to school environmental education, in terms of a rhetorical strategy for appealing to wider communities by repackaging environmental education in terms of the languages of 'democracy' (González-Gaudiano, 2007) or educational 'standards' (Gruenewald & Manteaw, 2007), discussion and dissemination of research with participants, teacher educators and other interested parties has often deliberately sought to challenge certain features of practice. A key focus of debate is that participation in environmental education still tends to reflect the initiatives of individual teachers, and even committed teachers' action is often constrained by dominant educational discourses (Barrett, 2007), while mainstreaming environmental education into the current school practice appears to involve undermining the ideals of environmental education by reinforcing rather than 'transforming' the school institutions (e.g. McKenzie, 2004).

It has been argued for some time now that a compartmentalised, rigid educational system hampers the fundamental changes that are often assumed necessary for mainstreaming environmental education in schools (e.g. Stevenson, 1987, 2007a). In the Korean educational context, critics identify the national culture of school education - the so-called "education fever" (Oh, 2002; Seth, 2002) of striving hard at competitions for academic success - as impeding progressive educational projects and undermining teachers' environmental education initiatives (CMEJ, 2003). Recent studies of environmental education in Korea have sought to investigate and address the gaps between teachers' beliefs and actual practices (Cho, 2002), and teachers' ongoing struggles to secure the pedagogical space for environmental education within the constraint of a rigid educational system (Kang, 2006). Qualitative inquiry into teachers' thinking and practice (which includes the aforementioned studies) has attempted to deconstruct the repertoire on the role of education, e.g. environmental education that can be viewed as 'fairy tale' (Harré, *et al.*, 1999; see Barrett, 2007), in ways that also serve to reveal that teachers' perspectives and voices are crucial for understanding the practice of environmental education in schools. This includes epistemological

and methodological perspectives as well as conceptual frames such as belief, action, voice and identity (Hart & Nolan, 1999; Hart, 2003).

In locating the study's main themes within the lines of research on school environmental education, the distinct purpose of the study for understanding individual teachers' constructions of environmental education in their personal and professional contexts requires further theoretical understanding for developing frames and perspectives. To explicate ways in which teachers' reasons for participating in environmental education out of their personal commitments and motivations can be legitimatised as teacher professionalism, the literature review has focused on the meanings of teachers' life experiences in terms of their formative influences on professional identity development and personal theories and curriculum knowledge. Central to theoretical investigation was the idea of 'teacher identity' in that a teacher's self-understandings and sense of efficacy constructed through contextual factors and cultural norms and values are the very core of teachers' knowledge and beliefs (Hoy, Davies & Pape, 2006; also Figure 2-1).

In this regard, Hart's work on Canadian elementary school teachers' environmental education provides examples of the epistemological and methodological groundings possible for developing such an inquiry that takes into account the notion of teacher identity and understands it by means of their autobiographical and life historical narratives. Other studies from different research frameworks and methodological perspectives address environmental education teacher identities (or what can be differently phrased) by focusing on their various formative processes and contexts (e.g. Payne, 1999a; 2000). Importantly to research methods in this study, teacher identities were framed from post-informed methodological perspectives as constantly constructed and constructing through the dynamic processes between multiple discourses, such as a 'proper', 'good', 'science' teacher that make cultural norms, resources, and subject positions available, and teachers' taking up those meanings and interpretations (*Environmental Education Research*, 2005, vol. 11 (4)). The assumptions underpinning this kind of framework are that teachers' thinking and practice in environmental education are formed through personal identity seeking - as a person, teacher, citizen, etc., and through the process of the 'blurring' of personal and professional identities that enables teachers to further diversify categories and approaches to environmental education - their curriculum 'repertoires'.

By considering teachers' environmental identities as sites where learning and professional development take place, the purpose of understanding teachers' environmental and curriculum knowledge is also concerned with those ways in which teachers come to recognise and become able to challenge the meta-narratives that impinge on the very concept of environmental

‘knowledge’ and ‘curriculum’. At the level of cultural and social discursive formation, discourses around the role of science in the face of the ecological crisis and sustainable development, are relevant entry points at which cultural processes of legitimatising the nature of knowledge and literacy occur, in ways that are geared toward societal changes toward dealing with environmental and sustainability issues (e.g. Beck, 1992; Wilsdon & Willis, 2004). Such discourses provide metaphors (e.g. the ‘greenhouse effect’) and cultural tools for organising our ideas about the environment (e.g. ‘ecological footprints’), and represent the contested nature of the meanings. It is at such contested sites of meaning construction where environmental learning can occur in the presence of multiple literacies and forms of knowing and knowledge (Scott & Gough, 2003).

Teachers’ curriculum development processes then should involve attention to teachers’ ways of constructing pedagogical meanings about the environment by reading and interpreting culturally produced meanings, e.g. lifestyles, pro-environmental behaviour, environmental issues, etc. from multiple perspectives, especially the ways in which teachers legitimatise pedagogical values of addressing environmental issues, e.g. how does it contribute to pupils’ learning? While matters of teachers’ life experiences and environmental identities can illuminate personal and/or collective ways of learning about environmental issues and knowledge, e.g. through participation in environmental movements or teachers’ study groups, they are not automatically independent of the discursive context of school education. Prominent in curriculum development, for example, is the changing discourse on competence in and with science in many countries, as this can provide normative ways of thinking about the role of science in addressing environmental and sustainability issues, through rhetorical work upon notions such as ‘citizen science’ (e.g. Irwin, 1995) or ‘scientific literacy’. Proponents of scientific literacy have also sought to develop pedagogical approaches to socio-scientific issues by considering learning objectives and effective learning processes, in shifting the focus from on learning ‘in’ science toward learning ‘about’ science (e.g. Kolstø, 2001).

However, critics from a poststructuralist point of view (e.g. Weinstein, 2006) further challenge the privileged status of science as a way of knowing as espoused in the dominant discourse of scientific literacy, hence their built-in limitations in dealing with uncertainty and risk that are the prominent nature of environmental and sustainability issues. A review of the current discourses of the role of science and scientific literacy then must be concerned with pedagogical norms for reformulating teachers’ roles and identities, and therefore, from the point of view of teachers, whether they allow some degree of legitimacy for teachers’ curriculum repertoires, e.g. more flexible or critical views of science, but under the influences of the power and dominance that science stories as meta narratives of environmental knowledge exert.

1.2.2. Narrative inquiry

For this study, I have principally used interviews to produce and collect data. I have met with eleven secondary school teachers in Korea who are all working at environmental education in their own ways and contexts. The interview methods were designed to encourage teachers' reflections on their (sometimes deeply held) assumptions and the values that construct their environmental actions and teaching practices. 'Life story' is used as a term here to articulate the scope of teachers' stories of environment-related experiences in ways that encompass their understandings of personal orientations and values, and the cultural and social contexts in which the teachers' lives and practices were and are embedded. In particular, the design of my inquiry aims to reveal the congruencies and discrepancies between teachers' own beliefs and values, and the realities that often obstruct teachers' actions in this area.

Framed as an inquiry, I wanted to know how we might better understand people's stories, and the roles of stories in teachers' professional and personal lives? The questions require theoretical elaboration, and in this study I have sought to understand, apply, and deepen my approach to 'narrative inquiries'. I use narrative inquiry here as an umbrella term that encompasses a range of epistemological and methodological interests in generating, understanding and analysing stories (see Chapter 3). Narrative inquiry is an established approach in educational research, primarily associated with the notion that people reveal their intentions, beliefs, desires, knowledge, and values through narratives (Bruner, 1996). Over recent decades narrative inquiry-based studies of teacher thinking and practice have flourished, premised on the key epistemological claim that we can view teachers' knowledge as ordered by 'stories' (Elbaz, 1983). Importantly this requires valuing teachers' 'personal practical knowledge' (Clandinin, 1985) as a valid form of knowledge.

Hart (1996) argues for the value of this strand to narrative inquiries of teachers' thinking and methods in environmental education research, in the sense that a critically interpretive methodology is catalytical to and illuminative of a legitimate pathway to professional development and change in teaching. With Elbaz (1990), Hart argues that in taking teachers' stories seriously, such inquiries must include examination of the various forms of discourse that make up the "social texts" of teachers. Thus my research methodology has been developed to serve the distinctive aim of the research, namely, to construct teachers' stories of environmental education not only as the 'personal' versions of educational realities, but also as a window into the discursive practices in which such personal narratives can be critically examined in connection with institutional and cultural narratives of the environment, education, and environmental education.

An overarching research concern then has been to develop (elicit, collect, write, and translate throughout the research process) stories of environmental education, in which teachers are seen to play the role of protagonist in acting and performing on the stage of educational practice, whilst also noting the ‘scenery’, ‘scripts’, ‘props’, ‘company’ and ‘improvisations’ that may be in play. In so doing, the key epistemological and methodological assumptions are that teachers’ stories can be seen as a window into the discursive practices in which teachers locate themselves, and these may create cracks and ruptures in the official discourses of school education owing to the tensions between these discourses in and of themselves, and/or with both ‘environmental education’ and ‘Environmental Education’ (e.g. Hart, 2003). For the purposes of the analysis, teacher stories are presented, and have then been transposed, to explore the discourses and narratives of current forms of (environmental) education, in ways such that contradictions and paradox in power/knowledge and dominant cultural narratives that convey particular meanings, values, identities, or models of action are critically examined and challenged.

This take on teacher narratives was further theorised within the framework of narrative-discursive approaches from a constructivist view of reality (Bruner, 1991; Brockmeier & Harré, 2001), and requires a reflexivity principle for investigating and participating in storytelling and interpretation processes by recognising that storytelling (including those generated in interview) is a socially situated action, and that stories are framed in and through interaction (Mishler, 1986; Riessman, 2003). In this, the value of teacher experiences as sense-making sources should not be taken for granted as directly readable from teachers’ accounts (Britzman, 1991; Clandinin & Connelly, 2000). Instead, inquiry processes have been concerned with opening up ways of talking about teachers’ experiences, through the dialogic processes of conversation and interpretation in which individual teachers’ unique life experiences have become located within the inter-subjective and cultural contexts.

From this perspective, the design of narrative analysis reflected particular ‘locations’ in which teachers’ stories are told (Clandinin & Rosiek, 2007). In this study, ‘personal’, ‘institutional’, ‘cultural’ locations, as sites where teachers’ ideas about environmental education are mainly concerned with ‘vision’(s), ‘professional identities’, and ‘curriculum’, respectively, were investigated in conjunction with the research themes premised upon research questions and theoretical considerations, as addressed in the previous section.

These thematic concerns of the analysis on the one hand, i.e. teachers’ stories ‘about’ environmental education, and ways of representing teachers’ personal narratives in thinking about the role of narrative inquiry, on the other, were another matter of concern. The assumption about

teacher narratives as windows into the discursive practices of school education required developing methods that ‘locate’ teachers’ personal thinking and ways of making sense of their experiences within a larger ‘context’, to address further issues about the role and limits of teacher narratives. The key approach developed in this study was to examine the significance of teacher narratives - their situated meanings - by means of juxtaposition, commentary, or further narrative analysis of other stories, and by using the stories that ‘surround’ teachers’ stories - the researcher’s story, other people’s reading of teachers’ stories, media stories, and research narratives of science and environmental education. In this, ‘intertextuality’ was a useful concept in identifying common themes that each text, i.e. teachers’ own accounts and other sources, were concerned with. In this way, this study developed a distinctive analytic framework for teacher narratives that are also grounded in the theoretical concerns of a narrative ‘genre’ for understanding environmental education as creating cracks and ruptures in the school education, and developed theoretically-informed, and empirically-evidenced accounts of the phenomena of school environmental education, concerning:

- Theme 1: Teachers’ life experiences as a legitimate source that contributes to sense-making about environmental education.
- Theme 2: Teachers’ professional identities and voice in school institutional context.
- Theme 3: Teachers’ environmental curriculum narratives as windows into the cultural practice of meaning construction in relation to the environment.

With this framework in mind, the final section of the chapter introduces the summary of the actual research processes in which theoretical concerns were further elaborated and calibrated through the process of fieldwork and inquiry methods development.

1.3. Summary of the methods of analysis

1.3.1. What stories, and how to interpret stories?

▪ Contribution of teachers’ environmental education to teacher professionalism

Chapter 4 discusses the processes in which eleven Korean secondary school teachers’ stories were developed and interpreted within the framework of narrative-discursive approaches. The meetings with eleven teachers for interviews were based on the overarching question of “How did teachers come to be engaged in environment-related activities?”, in order to elicit and frame teachers’ life

stories in ways that illuminate personal and professional identities. While the teachers' diverse backgrounds and specialism provide relevant themes for inquiry by highlighting teachers' personal theories of action, professionalism and curriculum, such diversity also suggested that the notion of "environmental education teacher" is not easily pinned down. Indeed, the plots and characters that stories appeared to develop illuminated teachers' sense of identity and agency as ongoing work, in that teachers' own questions and their ways of making sense of their environment-related experiences were deeply related to temporal and cultural historical situations in ways that also evolved their stories and lives.

Three research themes (see above) were developed in terms of the common question of what other and new meanings of teacher professionalism can be understood through teachers' stories about environmental education. They also offer opportunities to critique theories and models of teacher professionalism in relation to three aspects: self-understandings, institutional contexts, and curriculum repertoires. In this, the design of the interviews with the eleven teachers, their individual particularities (e.g. focus on science-related curricular topics) and Korean cultural and historical context (e.g. events and issues), all influenced their ways of telling stories: which stories to tell, how and why.

▪ **Personal, institutional, and cultural locations of stories**

In theorising teacher professionalism in the three aspects, narrative-discursive approaches provided another dimension to the inquiry: the locations of stories. The idea was concerned with how eleven teachers' stories could be located within the particular contexts that were concerned with different ways of meaning-construction. Thus, a teacher's stories about environmental education, while elicited as a likely form of personal narrative, could be related to other teacher participants' stories in this study and other texts of teachers, thematically and methodologically. Personal, institutional, and cultural locations were then discerned with arbitrary (but not fixed) boundaries where stories gained particular meanings in relation to theoretical and practical concerns about teaching practice, and each text provoked questions of:

- What does engaging in environmental education mean to the teachers themselves?
- What does it mean to be/become an environmental education teacher in the current educational context in Korea?
- What pedagogical meanings of the environment are given the role of cultural narratives?

1.3.2. Structuring teachers' stories into three chapters

Based on these methods, the main body of data analysis consists of three parts, each of which represents different ways of using teachers' stories by discussing theoretical and practical concerns about education and environmental education. Figure 1-1 displays the diagrammatic relationship between the phenomena under investigation, the analytic framework, and the teachers' stories that each data analysis chapter is concerned with.

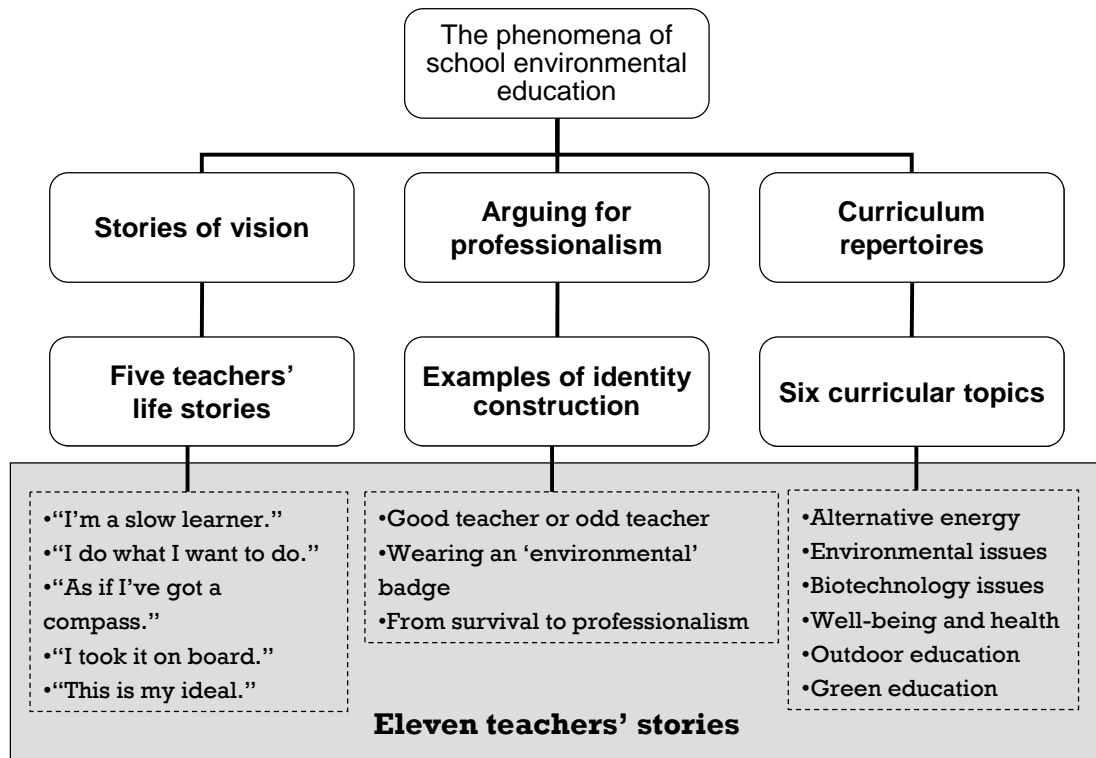


Figure 1-1 Making sense of teachers' environmental education

The main arguments and contributions of the thesis are then presented in Chapter 8, regarding the three main questions, with a focus on the significance of narrative inquiry for theorising teacher learning and examining the contributions of inquiries about environmental education to teacher professionalism and educational practice.

Chapter 2. Literature review: framing the research discourse for teachers' 'environmental' 'education'

❖ Chapter introduction

What do we know about the phenomena of school environmental education? Research underpinned by diverse discourses and perspectives presents the phenomena differently. For example, discussions within the field of science education have framed the environmental education research discourse in terms of their potential relevance or challenges to more conventional notions and practices of science education, by posing questions about what environment-related 'teaching', 'learning', and the 'curriculum' might look like, and critically examining them (e.g. Dillon & Scott, 2002). Yet it is the underpinning ontological, epistemological, methodological, and political stances that give a distinct character to the research themes and modes of 'inquiry'. Given this, a meta-perspective on research discourse helps researchers understand and critically examine how research practice is shaped by various assumptions, and how to develop and demonstrate critical reflexivity about their own practice. For environmental education research, this critical reflexivity seems paramount given the tensions and contestation of meanings and values that are implicated in the words such as 'environmental', 'education', and 'research', i.e. 'orders of discourse' (Reid, 2003; Gough, 2006).

Thus, in setting out research inquiries into the phenomena to situate and contextualise the points of view of teachers - i.e. how teachers make sense of environment-related experiences - the literature review in this chapter aims to identify and examine the theoretical and empirical underpinnings and perspectives that compose teachers' environmental education, by attending to epistemological and methodological issues. In so doing, I will identify and review what research has been concerned with and what needs to be done in relation to understanding the ways in which teachers think, conceptualise, implement, and act toward including the environment into their own contexts of teaching. The main themes for the literature review are to address:

- The institutional development of school environmental education at the international level and in Korea (2.1);
- Research on teachers' thinking and practice in school environmental education (2.2.1);
- Research on school environmental education in Korea (2.2.2);

- Research on teachers' professional lives and personal theories (2.3.1); and,
- Research on science studies and science education with respect to environmental learning (2.3.2).

2.1. Institutional development of school environmental education

The opening section of the review focuses on the institutional aspects of the phenomena of school environmental education, in relation to international discourse on environmental education, and that in Korea. In so doing, the aim is to identify the theoretical perspectives and models that frame the policy intervention on environmental education in the national context of Korea, with the view that such discourses and narratives often both form and inform normative ways of thinking about and practising environmental education, with the assumption that there is a conceptual (but not rigid) distinction between the discourses of Environmental Education or Education for Sustainable Development, and the small 'environmental education' stories told by teachers (see 1.1).

2.1.1. International background

Since the 1970s and the growth of international concern about global, regional and local environmental issues, many attempts have been made to define and foster environmental education as a response to this, with ameliorative, palliative and preventive goals in mind (e.g. IUCN, 1970). The need for teacher training to enable these goals to be achieved has been a constant theme since the UN Environment Programme (UNEP) was established after the 1972 Stockholm UN Conference on the Human Environment (UNESCO-UNEP, 1990). Internationally, a slew of regional projects and seminars were initiated within the framework of the UNESCO-UNEP International Environmental Education Programme (IEEP, 1975-1996) to promote and support formal and non-formal educational programmes. Their achievements were concerned with:

- the building of a basis for national environmental education policies and strategies;
- improved communication and coordination among environmental education interests;
- improved quantity and quality of relevant research;
- successful development of innovative materials for in-school and out-of-school and adult education programs; and,
- particularly high benefits where pilot projects had been carried out (Blackburn, 1983, p.274).

The IEEP-led international discourse since then was typified by such statements as “Environmental education should be an obligatory part of pre- and in-service teacher education” and “Environmentally educated teachers [as] the priority of priorities” (UNESCO-UNEP, 1990, p.1). In the discourse on the role of teachers, earlier discussion focused on identifying key conceptual framework and models for teacher professionalism, primarily concerned with teacher ‘competencies’. Wilke *et al.* (1987) defined a set of “expected behavioural competencies”: outcome-based qualities that “effective environmental education should be able to” result in, in terms of ‘foundational competencies in professional education’ and ‘competencies in environmental education content’ (ecological foundations, conceptual awareness, and investigation and evaluation). Later, Fien and Tilbury (1996) criticised the prescriptive approaches and the overemphasis on scientific knowledge of Wilke *et al.*’s framework, and proposed a more holistic and generic-competence based framework for teacher education, and also as a way forward Education for Sustainable Development.

Alongside the recognised diversities of practice and opportunity in different settings (e.g. Scott, 1994), much criticism has been prompted by a lack of understandings of potential barriers and resistance in practice, disregard for the multidisciplinary characteristics of environmental education, and a technicist, instrumentalist ethos underpinning many of these endeavours (Oulton & Scott, 1995). Given this, international initiatives have sought to address more contextual methodologies for teachers to engage with environmental education, with both participatory research-based professional development (Robottom & Kyburz-Graber, 2000) and reflective practice (Fien & Maclean, 2000) being seen as key approaches to teacher education and training that address well teachers’ own knowledge and concerns. In this, the OECD’s ‘Environment and School Initiatives’ (ENSI), an international government based network, has provided key resources for action research and international research collaboration. Recently, ENSI participants have put together their collective experiences by introducing case studies of teacher action research in different national contexts that offer reflective accounts on each case and practical insights acquired from the experience (Kyburz-Graber, Hart, Posch & Robottom, 2006). But more crucially, the authors also intend that these studies will provide a stimulus to generate critical ideas about teachers’ ways of knowing and learning from a participatory and social learning perspective, in ways that enable critical reflections on assumptions and values in environmental education, where the ENSI experience has illustrated the potential and predicaments of such a process through networking and collaboration within the international community (*ibid.*).

Accompanying international and national initiatives for pre-service and in-service teacher education, discussions of school environmental education have spawned multiple ideological and

political debates (for example, about those in the UK, Europe and for UNESCO-UNEP, see Oulton & Scott, 1994, 1995; Scott, 1996a, b). The ‘national standards’ dispute in the US illustrates contestation between opposing ideologies (i.e. behaviouristic versus non-behaviouristic expectations of environmental education) on the roles of education in society and the goals of environmental education (Wals & Van der Leij, 1997). While Wals and Van der Leij (1997) identified the contestation between the ideologies as incompatible, Roth (1997) argued for the need to attend to the actual educational practice and learning process which he regarded both approaches can contribute to. In spite of, or perhaps owing to the disputes, some North American educators, policy makers and commentators have sought to establish environmental education as “a means to meeting the standards set by the traditional disciplines” (NAAEE, 1996, p.2), which resulted in the framing of environmental learning as confined to an instrumental discourse in the ensuing projects of the NAAEE and NEET, e.g. in terms of its ‘benefits’ for achieving educational ‘effectiveness’ (Glenn, 2000; further critiques by Gruenewald & Manteaw (2007) will be addressed in 2.2.1).

In the UK, with sustainability education apparently replacing EE in 1999 through a ‘clarification’ (Chatzifotiou, 2002) of the place of sustainable development in the National Curriculum (DfEE, 1999, p.11), we begin to see evidence of a trend in pedagogies that has grown throughout Europe and elsewhere, particularly now that the UN’s Decade of ESD is underway (WEEC, 2005). Here, while this is characterised as an example of “reorienting education to address sustainable development” (UNESCO, 2005), such slogans need to be critically examined in terms of their discursive effects, in that they are often premised on prescription of a particular meaning or even advancement of a particular agenda or moral practice (Jickling & Spork, 1998). Also, the relationship between Environmental Education and ESD remains contested, particularly in how to formulate and reformulate relationships between ‘education’ and ‘environment’ or ‘sustainability’ in diverse cultural and pedagogical contexts (see the special issues of *Environmental Education Research*, 2002, vol. 8 (1); 2006, vol. 12 (3/4); Reid, 2003).

However controversial the languages of ESD are, the focus on ESD in some policy initiatives seems to work up toward a futuristic discourse of school education that is concerned with discussing visions of education for a sustainable future. Current initiatives for ESD indicators in Europe and Asia-Pacific region in the framework of the UN Decade on ESD illustrate such moves, by identifying learning, monitoring, and assessment as key drivers for implementing ESD (see UNECE expert group for ESD indicators; <http://www.unece.org/env/esd/SC.EGI.htm>, and UNESCO Bangkok; Tilbury, Janousek, Elias & Bacha, 2007). But different discourses around the goals and functions of ‘indicators’ exhibit further contestation or conflicts in configuring the field in the Decade. As the field has witnessed in the case of debates on standards for environmental

education, there is a call for research that critically examines how terminologies such as ‘quality’, ‘measurement’, and ‘standards’ configure a ‘management’ discourse and have further effects in (re)positioning and (re)presenting teacher’s work and roles in implementing ESD. In this, a recent report on ESD indicator initiatives (in the context of England and Germany, and cross-national level in Europe) identifies seven discussion themes for further consideration: a) clarifying the function(s) of ESD indicators, b) indicators as normative goals, c) the depth of change, and how it is measured, d) modes of governance and availability for indicators for different educational sectors, e) institutional tasks for indicators at different educational system levels, f) benchmarking and policy learning, and g) dynamics and innovation – the adequacy of indicators (Reid, Nickel & Scott, 2006). A recent ENSI (Environment and School Initiative) work on quality criteria for ESD schools also embraces the agenda by setting out key principles in three areas - the quality of teaching and learning processes, school policy and organisation, and the school’s external relations - and also offers a series of cautions:

In our view, a set of quality criteria is an instrument which summarises an ESD philosophy, that must be constructed and accepted jointly by all school stakeholders, and that cannot be considered as a tool for ‘quality control’, but as an opportunity for ‘quality enhancement’, open to ongoing debate in a participatory way. With this view, quality criteria should give orientation and inspiration but should not be confused with ‘performance indicators’ or the like. In fact, a set of criteria may be considered as a ‘translation’ of a set of shared values formulated in terms that are more explicit and closer to the practice but not as prescriptive and limited as performance indicators (Breiting, Mayer & Mogensen, 2005, p.9).

In summary, at the level of policy and assessment the expectations and relationships between ‘education’ and the ‘environment’ or ‘sustainability’ are changing, and there are multiple perspectives of interpretation about the possible relationships between EE and ESD (Hesselink, van Kempen & Wals, 2000; Wals & Jickling, 2000). Within these debates, the phenomena of school environmental education in Korea and in an international context can be shown to be in flux too.

2.1.2. Policy intervention in Korea

Policy intervention in Korea has progressed under the influence of these international discourses (e.g. *National Environmental Education Strategies for Sustainable Development*, Ministry of Environment, 2002) as well as those of its distinct educational culture (CMEJ, 2003). It is evident in Korean policy-oriented documents and research that key international documents provide relevant historical significance, but also national strategies and characteristics in other countries are often described to identify the principles for ESD: interconnectedness, sustainable development, interdependence, interdisciplinarity, partnership, citizenship, and life-long education; in ways that address cultural and social characteristics (ibid., p.49). Key issues and policy developments concerning school environmental education can be summarised as follows.

While until the 1970s, governmental initiatives and research communities intermittently addressed the potential significance of environmental education with the recognition of environmental issues and problems caused by rapid industrialisation in Korea (Cho, 2004; see Appendix 2.1 for an historical overview of environmentalism in Korea), with the focus on environmental awareness and knowledge, a more systematic move for establishing environmental education in schools emerged later (KEDI, 1991). This was accompanied by the initiation of cognate academic communities in this area. Particularly, The Korean Society for Environmental Education (KOSEE; www.kosee.org), established in 1989, has taken a key role in contributing to environmental education by garnering support for the sector from various social actors including academics, NGOs, schools, and governments. One of the important activities includes publishing the research journal, *Environmental Education* (the first volume was published in 1990, now three issues per year since 2004) (Table 2-1).

Significant moves towards institutionalising an environmental education curriculum in the National Curriculum have occurred since the 4th National Curriculum, announced in 1982. Historically, the development of the National Curriculum in Korea has been extremely centralised since the first National Curriculum in 1954, just after the Korean War was over. Since the 6th revision announced in 1992, reform initiatives that promote ideas such as ‘open education’, ‘student choice’, and an ‘elective curriculum’ were introduced, to ease the overburdening of teachers and students, and to achieve more effectiveness (Kim, 2004; see more in 2.2.2).

**Table 2-1 Professional activities of The Korean Society for Environmental Education
(Updated from Lee, 2006)**

Year	Conference themes	EE Journal (No. of Papers)
1990	1 st Strategies and Practices of EE in Korea	Vol.1 (18)
1991	2 nd Implementing EE	Vol.2 (9)
1992	3 rd EE in Korea and North-East Asia: EE in schools	Vol.3 (18)
1993	4 th Awareness and Action in EE	Vol.4, 5 (22)
1994	5 th EE in Schools, Private Sectors and Local Community	Vol.6, 7 (22)
1995	6 th Strengthening EE in Schools for 21C	Vol.8 (9)
1996	7 th Information and Globalization of EE for 21C	Vol.9 (6)
1997	8 th Development of EE in Schools and Society	Vol.10 [1, 2] (31)
1998	9 th Education for Recycling and Renewing 10 th Exploring EE for Youth	Vol.11 [1, 2] (37)
1999	11 th Strengthening EE for the 7th National Curriculum 10 years with KOSEE 12 th Development of EE in Korea	Vol.12 [1, 2] (42)
2000	13 th Leadership for EE Innovation 14 th Development of EE materials	Vol.13 [1, 2] (23)
2001	15 th Informal EE and experiential EE 16 th Improvement of EE materials	Vol.14 [1, 2] (24)
2002	17 th Affective Domain in EE 18 th Sustainable Development and EE	Vol. 15 [1, 2] (17)
2003	19 th Status and Vision of EE in Other Countries 20 th Partnership in formal EE and informal EE	Vol. 16 [1, 2] (13)
2004	21 th Leadership for EE 22 nd Past, Present and Future of EE in Korea	Vol. 17 [1, 2] (24)
2005	23 rd Sustainable Development and EE 24 th Earth Crisis and EE	Vol. 18 [1, 2, 3] (27)
2006	25 th Drivers for a Sustainable Future 26 th Sustainable Future and School Environmental Education	Vol.19 [1, 2, 3] (35)
2007	27 th 30-Year Anniversary of Tblisi: Localization and Globalization of EE 28 th Environmental Education and Sustainable Communities/Cities/Villages	Vol.20 [1, 2, 3] (29)

Subsequently, in the 5th National Curriculum, environmental education was addressed as one of the eight core areas of cross-curricular activities (Ministry of Education, 1987). This period saw the ‘intensification’ of school environmental education through a systematic approach to environmental education curriculum design by integrating environmental education throughout the whole spectrum of educational activities (Nam, 1995, p.110). Academic endeavours, especially based in KOSEE and KEDI (Korean Educational Development Institute), focused on curriculum development in primary and secondary schools. In the meantime, the bi-annual ‘Environmental Conservation Model School’ (1985-) initiative by the Ministry of Environment and the Ministry of Education has sought to ensure that environmental protection activities take root at the level of individual schools (Table 2-2). Case study reports (Ministry of Environment, 1999, 2001, 2003) show both the achievements and tasks for future initiatives. However, while setting exemplary cases can make the propagation of the initiatives easier through ‘transfer’ of the goals and activities to other schools, only a quantitative approach to evaluation has limitations in considering specific contexts in which individual schools operate, including the school culture (Lee, 2005, p.286).

Table 2-2 Environmental Conservation Model Schools (Ministry of Environment, 2006, p.5)

Starting year	85	87	89	91	93	95	97	99	01	03	05	Total
Kindergarten					2	2	2	5	6	8	13	38
Elementary school	4	4	4	4	3	3	5	8	8	8	13	64
Middle school	4	4	4	4	3	3	5	8	7	6	3	51
High school							3	5	5	4	3	20
Total	8	8	8	8	8	8	15	26	26	26	32	173

More recently, since 1999, The Schoolyard Forest Project initiative led by the Schoolyard Forest Committee under the supervision of ‘Forests for Life’, a nationwide forest movement network, has aimed to improve school outdoor environments and promote their use in education through collaboration with local communities. Although the primary focus of the project was on the physical aspect of the environmental improvement, rather than educational goals *per se*, aspects of environmental education are included as one of drivers for ongoing success of the project (Kim, 2003).

The most significant breakthrough in curriculum development for environmental education in the public school domain was the introduction of new but optional environment subjects for secondary schools. This was introduced following the 6th National Curriculum (Ministry of Education, 1992).

For the first time, a national research report on curriculum development (KEDI, 1991) officially addressed the need for an independent subject at secondary level as a means to expanding environmental education in schools. The new optional subjects are ‘Environment’ in middle schools and ‘Environmental Science’ in high schools (four hours per week, a one year course). ‘Environmental Science’ was later renamed as ‘Ecology and Environment’ by integrating interdisciplinary approaches into the curriculum to consider ecological knowledge and moral and ethical issues in addressing sustainability issues since the 7th National Curriculum revision (Ministry of Education, 1997). One of the features of the 7th National Curriculum (announced in 1997) was the introduction of an ‘elective curriculum’. This would enlarge the possibilities for teacher discretion and student choice of curriculum subjects (Kim, 2004). Other optional subjects in middle schools include Chinese Classics (previously compulsory), IT, and second foreign languages, while in high school, grades 11 and 12 can select from a whole range of optional subjects. Yet, given its optional status, the main curriculum areas in which environmental education can be implemented in elementary and secondary schools still remain the traditional subjects such as science and social studies, and the ‘discretionary activity’ (introduced since the 7th National Curriculum).

A recent ministerial report identifies the compulsory status of the subject as one of the crucial ‘indicators’ for quality school environmental education (Ministry of Environment, 2002). For now, as a new curriculum subject, its adoption rate is still low and in competition with other optional subjects such as Chinese Classics and IT: 15.2% in middle schools and 33.2% in high schools in 2003 (Table 2-3), but given that the curriculum is taught for only one academic year, the actual rate per year should be substantially lower, estimated as only 3% (CMEJ, 2003).

Table 2-3 The adoption rate of Environment subject (Ministry of Environment, 2006, p.4)

	97	98	99	00	01	02	03	04	05
Middle school (%)	11.4	12.5	12.4	12.5	14.3	14.7	15.2	12.9	11.8
High school (%)	8.7	14.9	18.0	18.9	21.8	22.1	33.2	27.3	30.3

Also, university-based academics have expressed concerns about the quality of teaching given that the curriculum is taught mostly by teachers who are not fully qualified in this area (Table 2-4), and thus argue for a stricter qualification system (CMEJ, 2003; also see 2.2.2).

Table 2-4 ‘Environment teacher’ qualification rate, 2005 (Ministry of Environment, 2006, p.6)

Total	BSc in Environmental Education	Certificate in Environmental Education	Other subject teachers who took part in in-service training in Environmental Education (360 hours)	Other subject teachers without any training experiences
Qualification	Teacher examination		In-service training	N/A
	Fully qualified			No Qualification
1,986	54	54	429	1,449
100(%)	2.7	2.7	22	73

Meanwhile, in envisioning the role of education as a broader societal goal beyond the school fence, *The National Strategy for Environmental Education for Sustainable Development* (Ministry of Environment, 2002) addresses key areas and achievement strategies, including formal/nonformal/private sectors. In accomplishing this, a set of indicators has been enlisted as a means to monitoring the progress of educational implementation in ways that distinguish short-term and long-term aims, and enable process- and reflection-based implementation cycles. Interestingly, the indicators for formal education sectors include the acquisition of a compulsory status for the environmental education curriculum, as well as the increase in the adoption rate of the current optional subjects (ibid., pp.71-72).

Another key framework for ESD proposed by the Presidential Commission on Sustainable Development (*The National Implementation Strategy for the UN Decade of Education for Sustainable Development*, Lee *et al.*, 2005) sets the principles and directions for implementing ESD in the context of the UN Decade of ESD (key strategies in Appendix 2). However, alongside the experience of failure in the attempt to legislate an *Environmental Education Promotion Act* (Choi, Shin, Lee & Lee, 2002), which was finally passed in the National Assembly in February 2008, a rhetoric-reality gap remains evident in the ‘up-streaming’ of environmental education into broader areas of the goals and agenda of policymakers. Furthermore, tensions are noticeable among the various discourses on the aims and principles of environmental education. While the traditional term ‘Environmental Education’ still dominates the discourses, sustainable development-related discourse has recently emerged by referring to ‘paradigm’ change in education or ‘re-directing’ education (Kwon, Kim & Min, 2002). However, as the rather awkward term ‘Environmental Education for Sustainable Development’ denotes, in the school field at least, the current aim is to integrate or progress rather than replace the current systems of schools’ environmental education curricula (Ministry of Environment, 2002).

In conclusion, in spite of critical voices that propose the aims of environmental education as an overarching framework for redirecting the whole system of school education, including the transformation of the decision-making system in the current National Curriculum model (e.g. CMEJ, 2003), the history of the institutional developments for environmental education seems to find more strategic and adaptive characteristics that are geared toward ‘mainstreaming’ environmental education in schools. With this policy context in mind, an analysis of curriculum development and teacher’s thinking and practice will be presented in 2.2.2.

2.2. Contextualising research on teachers’ thinking and practice in environmental education

Alongside these institutional developments and discourses, how do teachers perceive and experience environmental education? The next part of the literature review examines how research has identified and conceptualised the ways in which teachers’ thinking and practice can be understood.

2.2.1. Teacher’s thinking and practice

In environmental education research, conceptually related areas (e.g. beliefs, concepts, values, attitudes, reasoning) have been a dominant focus among specialist areas of research² (Reid & Scott, 2006, p.581). In fact, a broad range of research in this field catalogues and differentiates teachers’ and pupils’ diverse understandings of the environment or sustainable development (e.g. Loughland, 2002; Agelidou & Flogaitis, 2003, to name but a few).

A classical research theme in developing subject-based environmental curriculum and pedagogy has been to analyse teachers’ scientific knowledge related to environmental issues. For example, Summers *et al.*’s (Summers, Kruger, Mant, & Childs, 2000) interview study of primary school teachers’ understanding of environmental issues in the UK catalogues scientific subject knowledge, including that related to biodiversity, the carbon cycle, ozone, and global warming. The study sets out characteristics of teachers’ understandings and misconceptions that fall into three categories:

² Other areas include specific programmes or policies, general provision of environmental education (EE) or sustainable development education (SDE), theoretical aspect or frameworks for EE/SDE, and research-related (e.g. methods, design, approaches) (ibid).

scientific, partially scientific, and non-scientific views. Their work is further related to the provision of a guide for teachers in teaching environmental issues and sustainable development across the whole curriculum that was introduced in the National Curriculum in England and Wales in 2000.

Khalid's (2003) study specifically focuses on the misconceptions of environmental issues among pre-service high school teachers in USA. Student teachers were invited to respond to a questionnaire regarding the greenhouse effect, ozone depletion, and acid rain. The ratio of correct and incorrect answers among all statements was determined. The findings show degrees of misconception relating to confusion about scientific phenomena and terms. The role of the media was pointed out as one of the influences that shaped their thinking about environmental issues. Khalid also suggests that more student-centred methods that focus on particular environmental topics or issues could help students translate abstract scientific concepts and eliminate misconceptions. Not only teacher's subject content knowledge but also their pedagogical knowledge and skills are considered crucial for curriculum development.

Yet, teaching about the environment or sustainability is typically seen to be demanding for teachers, owing to goals and subject matter that go beyond the traditional pedagogic boundary of (science) education. Summers and colleagues (Summers, Kruger, Childs & Mant, 2000) point out that not only subject knowledge but also pedagogic knowledge in teachers' thinking must be considered for effective teaching practice. Environment-related teaching involves teachers in developing strategies such as a 'balanced role' in the classroom (Summers, Corney & Childs, 2003), but may also lead to 'learned helplessness' (Cross, 1998) in the face of pedagogical complexities, while engagement in further teacher education programmes may offer pedagogical solutions rather than professional development (see Gayford, 2004).

However, while these studies illuminate the importance of a teacher's capabilities in understanding the complexity of environment-related concepts, what actually impinges on the process of learning to teach or acquire environmental knowledge that is perhaps beyond their training experiences, has remained relatively unexplored. More recently, Corney and Reid (2007), in a study of student teachers' learning of ESD related subject matter and pedagogy, call for further work in identifying and developing the various sources and contexts for teachers' professional learning. Therefore, there is a need for either expanding or refocusing ways of understanding teaching practice as something that is more than simply constituted by teachers' conceptions and knowledge. Teachers' knowledge can be conceptualised in different ways, that is, not only in terms of factual understandings such as scientific knowledge, but also in terms of personal practical knowledge and

craft knowledge, by taking into account the teacher's personal experiences and reflections that form and transform teachers' thinking (Calderhead, 1996).

And it is in this vein that studies highlight the role of teacher beliefs. These studies focus on the ways and processes in which a teacher comes to think environmental education matters to him or her, or to engage in environmental education. Values are also a useful vehicle for examining possible links between knowledge and teacher action. Indeed, some researchers have addressed disparities between theories of environmental education and its actual implementation (see below). Here, in contrast to more empirical-analytic focused studies that are concerned with identifying and measuring the relationship between beliefs, attitudes, and behaviour (e.g. Dillon & Gayford, 1997), qualitative inquiries are often chosen for understanding, addressing and challenging the institutional barriers that structurally obstruct the radical changes deemed necessary for effective environmental education to happen in schools.

Middlestadt *et al.*'s (Middlestadt, Ledskey & Sanchack, 1999) large-scale study of US elementary school teacher beliefs about environmental education examines common categories of beliefs with an assumption that understanding teachers' beliefs can inform ways of developing how to encourage their action and participation or overcome perceived barriers. Through content analysis, categories were identified including beliefs about the value of environmental education, advantages and disadvantages of teaching environmental education, social norms and expectations from others, facilitators and barriers to teaching environmental education, and successful approaches to overcoming barriers such as self-motivation and building support from teachers (*ibid.*). The particular aims of this study were largely driven by the goal of developing strategies for teachers in a teacher-training course; therefore, the analysis was rather survey like and thus limited in providing in-depth understandings about teachers' thinking. Also, the meaning of 'belief' remained vague or underexplored, by assuming that notions of belief can be directly gleaned from teachers' written accounts in open-ended questions.

In contrast, Cotton's (2006) study of the beliefs of three geography teachers teaching about controversial environmental issues in the UK schools demonstrates the ways in which the disparities between teachers' espoused beliefs (e.g. 'liberalist education'), and theories of environmental education ('education 'for' environment') can be understood via in-depth interview studies. In Cotton's study, the main aim of the teachers was to give students a 'balanced' picture of environmental issues; they put great effort into avoiding the imposition of their own views, sometimes by deliberately taking on a 'devil's advocate' role. Overall, the stances that the three teachers chose concurred with those of a 'neutral teacher' discourse (Kelly, 1986). This is starkly

opposed to the 'committed' approach that is promoted by critical theorists of environmental education, such as Fien (1999). This observation led Cotton to the conclusion that environmental education curriculum development should take into account subjective and objective constraints on teachers' actions in the way that the implementation is "carefully mapped onto the actual working lives of teaching" (Olson, 1992, p.69, cited in Cotton, 2006, p.79). Similarly, Walker (1997, p.161) argues that environmental education theory should provide "practitioners with the opportunity to reflect on their own practice and through critical dialogue to develop a more adequate theory", in that it should be teachers themselves who become able to identify an adequate theory in their own contexts, rather than any prescribed one, such as socially critical theory.

Whereas Cotton's study focuses on teachers' pedagogical beliefs, Cho's (2002) study of Korean secondary school teachers' thinking in environmental education taps into the diverse environmental orientations that underpinned teachers' beliefs about environmental education. Cho's research was concerned with the question of "How are the practices of environmental education in schools made by teachers?", given an institutional context in which environmental education is not mandated and therefore still largely in the hands of individual teachers. In-depth interviews with committed teachers identified five definitions of environmental education that were interpreted as underpinning teachers' beliefs about environmental education. These are, that environmental education is: i) about fostering ecological sensitivity, ii) values education, iii) about encouraging action and participation, iv) about taking into account ecological worldview in learning about environmental issues, and v) about fostering critical awareness on social and structural problems. These views on environmental education were related to teachers' ecological orientations, in theoretical terms, in terms of how predisposed they were toward an eco-centric worldview (including both social ecology and deep ecology) and beyond that of a techno-centric worldview (e.g. Dryzek & Schlosberg, 1998).

However, it was also observed that the actual programmes developed by the teachers tended to address narrow aims for learning, that is, they were mainly concerned with developing ecological sensitivity, amid the other potentials sought in diverse definitions of environmental education, e.g. an explicit focus on changes in pupils' environmental values. Understandings of teachers' views of the reasons for such discrepancies revealed the teachers' lack of competence when their espoused approaches were more likely to be challenged rather than supported by the ways in which pedagogical contents and methods were enacted in the current National Curriculum system (see 2.1.2 and 2.2.2 for more about the National Curriculum in Korea). Although the study did not address theories of environmental education such as liberalism and critical theory as Cotton's did, nor was it clear whether teachers' dispositions could fall into either of categories as was the case in

Cotton's study, both studies share the idea that there is a need to develop practical strategies for instructions and professional development in addressing values and issues through teaching (Cho, 2002, p.62).

Moreover, in spite of their different foci, both studies share an interest in exploring how a teacher's own beliefs about environmental education are often in tension with normative theories and practices of education. Findings from qualitative analysis suggest that there are no easy off-the-shelf choices for curriculum models and strategies, nor that there should be one overarching theoretical framework for environmental education, in such ways that a teacher's beliefs can be translated into effective practice (Walker, 1997). Considering that the focus of inquiry into teachers' thinking lies with interpretation rather than intervention (e.g. developing particular curriculum models) in my study, this underscores the importance of investigating personal beliefs and values in teacher thinking and practice as *legitimate research concerns* (the theme in educational research will be pursued in 2.3.1), with a focus on different modes or processes involved in the ways in which teachers' thinking, beliefs, motivation, or intentions, form or are translated (or not) into teaching practices, for example, by further excavating the deeper roots and layers of institutional barriers, or by tracing formative influences on becoming environmental education teacher through social-cultural frames that enable 'learning' (Hart, 2008a), or produce particular cultural constructions of the 'environment' or 'environmental education' (see Chapter 4).

While research interest in teachers' beliefs reflects in part a need to critically attend to a distinct aim of environmental education that expects the teacher's personal initiatives and thus the teacher's own interpretation of the aim(s) of (environmental) education, the characteristics of research approaches and methodologies in environmental education research have still tended to mirror those of education research in general. Calderhead's (1996) review of research on teachers' beliefs points out that belief and practice are mutually constituted, rather than say, changes in belief result in changes in practice. This suggests that any changes in curriculum and practice cannot be achieved in a mechanistic way, and the processes in which teachers engage and experience environmental education, and their interpretation of those engagements and experiences, must be taken into account in inquiry. Thus, research must develop ways of interrogating such processes that address more formative influences on teacher's beliefs such as teacher's 'internalisation' of dominant institutional values. As Fang (1996) argues in another review of this area, such research can be explored through different methodological approaches such as narrative inquiry and life history, as these can transcend the limits of more conventional thematic analysis methods in qualitative research. Hart and Nolan (1999, p.26) address this issue too, arguing for the critical investigations of methods in order to develop research inquiries into teachers' thinking and practice through collaborative processes.

Discourse approaches can be one of alternative methodological frameworks that help investigate the problematic relationship between teachers' beliefs and practice by interrogating the role of 'discourse' in constructing teacher subjectivities through the effects of power relations. Indeed, some poststructuralist scholars have begun to address the need to reconceptualise 'teacher self' as constantly constituted by discourses rather than as a fixed role that a teacher possesses (St. Pierre, 2000). Zembylas (2003, p.107) further criticises the individualist view of an essentialised autonomous self, especially the assumption of identity as serving "as the repository of particular experiences in classrooms and schools, the site of thoughts, attitudes, emotions, beliefs, and values".

In sharing this perspective, Barrett (2007) set out to investigate an individual teacher's action regarding environmental education. Distinct from previous studies in the field, she shifts the focus from a teacher's beliefs *per se* onto the problem of 'agency'. The implication is that even highly motivated teachers must encounter the rhetoric-reality gap, and she regards the problem as embedded in a teacher's self-disciplining process as impinged upon by dominant educational discourses. From a poststructuralist perspective then, further examination of the limits of language is considered to be key to uncovering the more fundamental processes in which the power of dominant discourses produce contradictory subjectivities and subsequently undermine the possibilities of teachers' strong beliefs feeding through and back from their actions. Instead of suggesting direct changes at an institutional level, Barrett argues that researchers need to read more carefully the narratives of the 'gaps', by interrogating the very way in which "particular truths and practices are produced and maintained as dominance" (ibid., pp.219-220). Also, self-reflective narratives of her own experiences as an academic and environmental educator are used to demonstrate how the everyday language and text she uses and produces create and sustain the very 'gap' between her own beliefs and actions.

In this respect, poststructuralism can contribute to investigations of the languages, and in particular the 'discourses', that impinge on the ways and processes in which the normative practices of teachers' work and responsibilities are maintained rather than challenged (also Britzman, 1991). Accompanied by the critical interrogation of such discursive processes, those teachers' narratives that more authentically express a teacher's voice to the extent to which tensions are reflectively recounted and critically examined have been requested by environmental education researchers such as Hart and Barrett (see below). These imperatives inform this study's attempts to develop a research framework that enables such forms of inquiry into teachers' narratives (e.g. through post-informed narrative inquiry; see Chapter 3). In other words, attention to narratives and discourses can contribute to opening up and widening the discursive spaces through which more multiple meanings and sites, regarding the question of what is considered to be "environmental education

teacher identities”, can become available, within and across personal, institutional, and socio-cultural spaces. In this respect, the remaining section examines the ways in which recent research has addressed issues related to ‘teacher identity’ in environmental education.

A long-term narrative study of Canadian elementary school teachers’ thinking and practice by Hart and colleagues (Hart, 2003) stresses the role of teachers’ stories, claiming that teaching practice of environmental education “can only be made intelligible by reference to the quite complex ways of thinking by which teachers come to understand what they are doing and why” (ibid., p.196). The epistemological and methodological perspective adopted therein is that it is through teachers’ stories and personal narratives that readers can begin to see the tacit, dialectical ‘connection’ between a teacher’s moral knowledge and ethical action (ibid., p.208). In other words, the stories that teachers tell by reflectively recounting their experiences and commitments to environmental education including ‘the reasons’ for their doing so, help us to understand the underlying moral values and virtues that can work as a fundamental basis to teachers’ thinking. While the long-term study is concerned with the significance of ‘formative life experiences’ in teachers becoming environmental educators, the perspective underpinned by narrative inquiry is distinct from those of previous studies of Significant Life Experiences (e.g. Palmer, Suggate, Bajd & Tsalike, 1998), in that teachers’ epistemologies and identity formation processes are not automatically assumed to be accessible to the researchers as forms of categories and concepts. Instead, Hart argues that the moral and ethical dimensions of teachers’ knowledge are better understood through storytelling approaches, given that both researchers and teachers participate in critical dialogues of constructing meanings through conversation and interview methods, for example (Hart, 1996).

This suggests that there is a need to develop theoretical and methodological approaches that adequately address the various modes of teachers’ constructions of their identities in relation to environmental changes and their consciousness: in Hart’s (2003) study, for example, teachers’ stories of ‘reason’ behind their participation in environmental education. It is also because ‘identity seeking itself *is* an educational cause’ (Payne, 2000, p.79, original emphasis), and in the case of teachers, for living through their professional experiences and envisioning their career as a teacher. For example, research inquiry into teacher identity can be further developed by taking into account teachers’ environmental identities, and how these interact with notions of teacher professionalism (see also 3.3.2).

These aspects of teacher identity remain underexplored in the field of environmental education. Indeed, the very idea of teacher identity should encapsulate facets of their personal, professional, social, environmental identities (Payne, 2000). It can potentially contribute to advancing ways of

examining a teacher's knowledge and understandings of the environment or sustainable development because of its purchase on the complex nodal points that articulate, reflect or tie together a multifaceted field of personal and cultural values, and experiences and narratives that concern the environment. In this respect, Payne's thesis proposes a distinct approach to inquiries into identity formation by focusing on the notion of 'embodied subjects' - "their *being* an identity or identities in the 'lifeworld'" (Payne, 2000, p.81, original emphasis and italics). Payne's theorising of the educative subject is grounded in critical examination of the tensions of two schools of thought in environmental education, typified by Robottom's social ecology (modern) and Bowers' deep ecology (postmodern) (Payne, 1997). In terms of curriculum theory in environmental education, the focus lies in learner's 'agency' and its retrievability "by stressing embodiment as a site of inquiry, explanation and praxis" (Payne, 1999a, p.149), through phenomenological inquiry of everyday mundane practices related to the environment, characterised by postmodern challenges and conditions through which a subject lives through multiple stories and fragmented experiences.

From this perspective, crucial to inquiries into teacher identity, if not the post-phenomenological ones by Payne, are ways of scrutinising identity resources for (individual or collective) teachers' identity building through embodied actions and experiences, e.g. lifestyle or historical consciousness, and their ongoing tensions with discourses and narratives of ecological crisis and imperatives of 'environmental education' of different forms and levels, e.g. international and national policies, and a National Curriculum (in relation to the concept of narrative identity, Chapter 3 reviews methodological approaches in both education and environmental education).

Operationalising the idea of teacher identity in view of storytelling and structures or characteristics of teacher narratives, the remaining part of the section explores ways of utilising research outcomes by focusing on teachers' sense-making processes and the discursive influences upon them. Nikel's (2005) study of student teachers' conceptions of ESD illuminates the notion of 'rationality' in relation to generating a sense of 'responsibility'. Nikel developed an explorative framework for responsibility ascription through an abductive analysis of data derived from a multiple design empirical study. The framework suggests that student teachers' sense making about ESD may recourse to one of at least four identified rationalities for ascribing responsibility to oneself or other persons (ibid., p.281). They are: a) Internalist, b) Reflectivist, c) Regulative, and d) Instrumentalist/Realist. Each type is presented as "de-contextualised", and "fundamentally cognitive" (ibid.) dimensions to teachers' thinking. Various uses of the framework are suggested, however, in ways that examine the underlying arguments about a teacher's role and responsibility in terms of how they underpin different discourses (e.g. of environmental education and ESD),

official National Curriculum documents, and teachers' own perspectives. Although the focus of the framework was not on the contextualised processes of identity construction, e.g. a teacher's lifeworld, the framework can be used in exploring various and wider discursive contexts involved in teachers' identity construction processes, including notions of decision-making, duty, contribution, sense of well-being, etc. that remain underexplored in this field of research (Nikel, 2007). For example, in Payne's terms (1999a), it might be questioned as to how a particular responsibility discourse operates as "given truths or messages" and influences on teachers' lifeworlds (p.150), in structuring teachers' everyday experiences of (environmental) education and the contradictions in 'narratives in narratives', e.g. a preferred decision (not) to ascribe responsibility vs. one's mandated professional role.

Another area in which a teacher's identity construction processes can be investigated is found in the ways in which teachers respond to, or develop strategies for dealing with, policy-oriented curriculum demands. For example, Gruenewald and Manteaw (2007) have investigated how the US 'No Child Left Behind Act' of 2001 that has recently come to dominate much research and practice there works against environmental education. They observe two distinctive forms of teacher response to the dominant accountability and achievement discourse in implementing environmental education.

First, 'accommodation', or 'playing the game', is a more institutionalised version of the narratives in which teachers are seen to work to prove the contribution of environmental education to students' academic achievement through measurable outcomes, such as test scores (Lieberman & Hoody, 1998; Glenn, 2000). But here, the cost is obvious in that this misses opportunities for enacting and recording the learning outcomes that are directly in tune with other aims of environmental education, such as outdoor-based, experiential learning (Grunewald & Manteaw, 2007, p.178). Second, as a counter-move to such conformed action, the authors propose the need for a more critical version of the narratives in which teacher identities are portrayed as taking more subversive and radical roles. Here, their argument is that environmental educators need both strategies rather than only one, in responding to the accountability discourse and in achieving the aim of environmental education, i.e. by "casting a wider net" (ibid., p.180).

However, their analysis of two narratives is limited at the meta-level to that research only and a literature review; therefore, the actual ways and dynamic processes in which individual teachers take up a policy discourse in acting for environmental education in their own contexts do require further examination. For this, the two different ideas can be applied to narrative or discourse analysis methods for examining teaching practices, that is, how teacher identities are constantly

negotiated in the face of the tension between teachers' espoused beliefs and the actions taken when they are impinged upon by dominant and shifting discourses.

Finally, given the interdisciplinary nature of environmental education curriculum and in conjunction with the study's specific focus on science teachers' environmental education, studies in science education will now be discussed to illustrate this research perspective.

Michael and colleagues (Michael, Grinyer & Turner, 1997, p.14) examined biotechnology teaching in relation to teachers' identities. They note 'ambiguities' or 'ideological dilemmas' with which teachers are faced in teaching about controversial issues. In this study, the ambivalences were framed by two different discourses of biotechnology. In a 'pure' discourse, teachers constructed their identity as primarily 'scientists' and 'the mediators' of pure science. In contrast, in an 'impure' discourse, their role was understood as 'enthusers' and 'educators' who prepare their students for the messiness of the everyday world. On science teachers' identity forming processes, Fensham (1997) points to an 'induction process' in which science teachers construct a conception of 'school science' in their own schooling experiences, and notes that even progressive teachers tend to use STS (Science, Technology and Society) materials more in order to be able to teach scientific concepts effectively than to question the nature of science (the aim of STS education, ironically). Other studies investigating relationships between science and environmental education (Ashley, 2000; Gough, 2002; Hart, 2002a) also open up possibilities for identifying other and further relationships between science teacher identity and discourses of environmental knowledge in educational practice, namely, discourses on the changing role of science education in society and correspondingly, teachers' responsibilities, e.g. scientific literacy for citizenship (see 2.3.2).

Looking ahead, recognising the role of the personal, social and cultural spheres in teacher identity formation suggests that there is a need to investigate how teachers' perceptions of their pedagogic role in teaching environmental issues are shaped by the different discourses that come to constitute their particular ways of defining and knowing environmental knowledge within a social and cultural milieu, rather than as something that can be directly 'read off' from science or science education (Dillon, Kelsey & Duque-Aristizábal, 1999). Concept-based studies, therefore, need more careful conceptual framework for understanding a teacher's knowledge and conceptions, for example, in conjunction with earlier discussion in this section, by overcoming the dichotomy of a scientific and unscientific point of view, i.e. how science teachers' 'misconceptions' related to environmental issues are potentially formed by diverse learning contexts such as varied ways of access to 'environmental information' or personal and cultural environmental values?

Increasing interest in teacher identity in the science education field seems to reflect such a need to reconceptualise teacher learning and professional development as identity forming processes in the ways that personal or cultural identity ‘resources’, e.g. ‘out-of-school contexts’, are considered opportunities to diversify learning activities (Luehmann & Markowitz, 2007). Studies such as this present further research issues to be examined, including: to what extent or in what ways inquiries into science teachers’ identities can be linked to the matters raised by studies in environmental education regarding teachers’ construction(s) of environmental education, for example, understanding of a teacher’s perceived boundaries in the contribution of science education to environmental education and providing conceptual frameworks for examining and challenging how such ‘boundaries’ are drawn with respect to teachers’ personal and professional identity formation processes.

In summary, the literature review in this section has listed issues associated with inquiries of teacher identity to understand and examine ways in which teachers make sense of their environmental education experiences. Indeed, it is clear that studies need to address ways of mapping teachers’ various understandings of what it means to teach as something beyond the cognitive dimension of knowledge and conceptions, with a focus on how teachers’ common and differentiated pursuits of environmental identities make contributions to particular constructions of ‘environmental education’ through diversifying professional identities and meaningful curriculum practices.

With this in mind, the next section focuses on the critique of research on school environmental education in Korea, in order to develop a clearer sense of what is possible and necessary as a research inquiry through which teacher identity can be further examined in relation to Korean cultural and educational contexts.

2.2.2. The Korean cultural and educational context

Education has been central to Korea’s rise. At the end of Japanese occupation in 1945, literacy levels were extremely low and only 800 Koreans had graduated from university. Education institutions were moulded to the needs of export-oriented industry, and strong links between firms and vocational high schools enabled a skilled workforce to develop that was loyal to the company. The system today remains highly competitive, and is based mainly on rote memorisation.

Education investment increased from 2.5 percent of GDP in 1951 to 17 percent in 1966, and literacy rates began to rise. By 2006, the share of 25-34-year-olds with at least an upper-secondary qualification surpassed 95 percent, the highest of all OECD countries. Education is a national obsession in Korea. It is common for children to be sent abroad to study English at the age of 10 or 11. Children also work late in the night doing homework and attend crammers to train them for highly competitive exams. Their score dictates what schools they can apply for. At the age of 15, Koreans lead the world in maths and sciences. (Webb, 2007, pp.22-23)³

This macro-level sketch epitomises the role of school education in Korea. Stories of the Korean educational system and achievement known to the outside world have been typified by a storyline of ‘miracle’, in which the role of education is told to be the key driving force in rapid economic growth, as it is often the case in the stories about other East Asian ‘dragons’. But as Seth (2002) argues, in capturing this Korean educational story in terms of “educational fever”, that is the preoccupation with formal schooling that has propelled Korea’s educational development, both storylines are now common-sensical among academic researchers who take a cultural perspective of school education in Korea, as well as for the public and the media. For example, *KEDI Journal of Educational Policy* (2005, 2(1)) focuses on the phenomena of educational fever from comparative perspectives as well as through theoretical and empirical analysis from Korea. Kim *et al.* (Kim, Lee & Lee, 2005, p.8) explain the term in detail: “Education fever is a familiar concept not only in Korea, but also in other Asian countries (e.g., China, Japan) where Chinese characters are the written language. Education fever is directly translated from a Chinese word, 교육열(Kyoyuk-Yul) (教育熱) combining two words, 교육(Kyoyuk) (教育; education) and 열(Yul) (熱; energy, heat, fever). The reason why the researchers choose ‘fever’ in English instead of ‘energy’ or ‘heat’ is associated with the somewhat negative nuance of education fever in Korean society”. Typical examples of this fever phenomenon are as follows: parent’s high expectations of education, fierce competition for university entrance (so-called ‘exam hell’), and excessive investment in private tutoring (cram schools or private instructors)⁴ (Kim, Lee & Lee, 2005, p.8).

³ This extract is from the recent research project – “*The Atlas of ideas: Mapping the new geography of science*”, conducted by DEMOS (www.demos.co.uk), the UK independent think-tank. The research analyses the cultural and institutional innovations toward scientific progress in three Asian countries, China, India, and South Korea, with an aim to advise UK strategies for international science collaboration.

⁴ ‘Private tutoring’ is distinct from ‘private education’. In Korea, private education is regulated by the national educational laws, and therefore, integrated into the public domain of education policies and systems.

Indeed, these phenomena prevail within the Korean mainstream culture, and accordingly have a powerful influence on the ways in which the expectations of school education are conceived. Here, the extremely centralised systems of the National Curriculum can be understood as operating at the institutional level in determining what and how to teach and learn in schools. However, more recently, since the mid-90s, stories about an educational ‘crisis’ and ‘school collapse’ (Kim, J., 2002) have preceded subsequent reform initiatives, often grounded in inconsistent and opposing views. The 7th National Curriculum revision (announced in 1997) is an oft quoted example to which these contradictions and confusion are central (Ham, 2002):

Nowadays, the public school system confronts a range of contradictory requirements, and it is in this context that recent education reform policies have been implemented. It is believed that creating a ‘good school system’ not only means achieving higher test scores, but also reforming curriculum and teaching methods to reflect ‘real life’. The first requirement reflects the worldwide trend for focusing on terms such as ‘efficiency,’ ‘liberal competition,’ and ‘privatization’. The second one arises in the context of Korea, which has had a highly standardized and competitive education system. (Kim, 2004, p.127)

A key question then is how does such a cultural ethos influencing environmental education? Although a macro-analysis is beyond this study’s scope, the existence of rhetoric-reality gaps in school environmental education (2.1 and 2.2.1) offer grounds for critical inquiries that scrutinise the culture of education within which particular ‘discourse-practices’ of environmental education emerge (in the sense that discourses and practices are not entirely separable but co-constructive, Cherryholmes, 1988). Thus, studies of teachers’ thinking and practice in Korean educational contexts provide relevant research contexts for examining the ways in which teachers and researchers have addressed ‘culture’-related issues in terms of three key aspects: institutional barriers, methodology, and Environmental subject matter.

Research might seek to address ‘institutional barriers’ to environmental education, such as the strict curriculum division and timetable that hampers teachers’ initiatives on environmental education. In this regard, while many Korean studies have examined the pedagogical content and teaching approaches that fit with the aims of environmental education (e.g. on ‘behaviour’, Hwang & Lee, 2005, and ‘controversial issues’, Lee, 2004), the scope of the analysis tends to be limited to the boundaries of a subject or curricular themes, and do not consider, for example, collapsed curriculum spaces, cross-curricular approaches, or non-formal educational opportunities within or out with schools.

In contrast, it is through in-depth qualitative studies that teachers' practical knowledge and concerns about environmental education have been addressed from a teacher's point of view. Cho (2002, p.51; also in 2.2.1) finds that issues and problems that restrain the enactment of environmental education in schools as addressed in the previous studies are limited in their talk of a 'lack', e.g. lack of teacher interest or institutional support. Cho's study aimed to represent teachers' own concerns and voices by raising issues about the restraints that the national curriculum system imposed on achieving the aims of environmental education, through an analysis of the ways that it matched up with a teacher's own pedagogical beliefs and environmental orientations.

Kim's (2002) ethnographic case study focuses on teachers' involvement in environmental education through 'discretionary activity'. This is a new curriculum space created by the reduction of the compulsory curriculum content since the 7th National Curriculum, with the aim of nurturing pupils' creative talent. An interpretative methodology was developed, drawing on the ways in which the individual cases of environmental education at a school in 'discretionary activity' are located within different 'scenes' in which the 'school institution' operates; therefore, meanings of environmental education are constructed within the dynamic relationships among the scenes. Kim's analysis illuminates the ways in which 'discretionary activity' is allotted and implemented in terms of 'institutional discretion', rather than to serve the intended aim of supporting pupil discretion in terms of their choices of learning opportunities (ibid, p.93). Thus, it is argued, the educational ideal of environmental education directed at integration, i.e. via holistic approaches, is obstructed by the divisionary institutional system of school education, and in which environmental education through discretionary activity can become the very example of the problematic.

However, the relationships between 'dominant' systems and cultures and teachers' enactment of environmental education, have not been clearly examined. Where the studies have identified teachers' interpretations of the National Curriculum based on their environmental orientation or pedagogical beliefs as key motivations for addressing environmental or sustainability issues, the focus of inquiry has remained at the 'individual' or 'personal' level of thinking and practice. Consequently it can be argued that individualised teaching practices tend to be sustained, and hence, the discourse of professional development constrained, in research accounts, in which a teacher's passion for environmental education is bound up with the isolating school culture. There is also a lack of exploration of the relationship between 'environmental education' and other educational issues. Some might argue that macro educational issues are considered too big to address given the low status of environmental education, but the opposite logic is also valid: if environmental education is to be innovative, research must focus on knowing to what extent environmental education can create cracks and ruptures in thinking about and carrying out education in schools.

For example, how might teacher's participation in environmental education foster not only pupils' environmental learning but also a more collegial culture among teachers in general?

Implicit within such a critique is a call for research that addresses issues related to a school culture as both enabling and constraining teachers' actions and implementations of environmental education, in ways that not only analyse the individual teacher's thinking and practice but also provide shared languages that penetrate or push further the boundaries between the individual teacher's actions and those of school institutions. A recent study of the partnerships between schools and NGOs for environmental education (Kim, S. 2007) offers some initial insights into the ways in which the languages of 'school organisation' can be further examined. In analysing the collaboration process between schools and NGOs, 'empowerment' was identified as one of the key issues in sustaining partnership. Empowerment of the school organisation, not just individual teachers or volunteer educators, was examined with the underpinning assumption that the school organisation was an open system in which boundaries and areas in/outside school can be pushed rather than closed off in pursuing further partnership (ibid., p.177). This perspective further enables critique of the language of the system as taken-for-granted, while the issue of the authoritative top-down communication system that regulates collective decision-making processes and ways of doing things (ibid., p.199) can be further critiqued in relation to the discursive practices in which 'volunteer' participation and action is perceived as a key to partnership rather than partnership itself being regarded as a system.

This suggests that not only the themes of the research but also the methodological framework must address issues related to educational cultures. As Noh *et al.*'s review of environmental education research in Korea since 1987 notes, the dominance of survey (21.2%), literature review (31.7%), and introductory commentary (20.3%), (Noh, Lee & Park, 1998), it also reports that it is only in more recent years that more qualitative-oriented studies have been conducted. But many of these qualitative studies of school environmental education focus on understanding 'cases' of teaching and learning practices, such as teachers' expectations on the students' learning (Kim, C., 2002), pedagogical difference among groups of teachers (Kang, 2004), and teachers' beliefs (Cho, 2002). Here, the methodological focus has been on the interpretation of teaching and learning practices, conceptions, and knowledge without further appraisal of the ontologies and epistemologies that such 'interpretations' are grounded in, or consideration of historical, political, and cultural contexts that impinge on pedagogical practices, that is, that form more than just the 'background' of the study.

For instance, Kim's study illuminates the value of teachers' life histories as formative influences on their environmental education perspectives (Kim, C., 2002; see the discussion in 3.3.1). However, interpretations remain within the context of teachers' personal circumstances and experiences, they are not pushed further to address particular cultural and historical influences that might be involved in or enable the formation of teacher's dispositions. Even at the level of Korean doctoral research in this area, the thesis tends to focus on the presentation of data analysis without critical examination of the broad range of possible research methodologies. This is also evidenced by the observation that there are no qualitative oriented studies that highlight the macro-micro dynamics of environmental education discourses-practices in ways that sometimes go beyond considerations of schooling context, through, for example, different approaches such as discourse analysis or historical approaches to inquiry. Thus, despite the more recent tendency towards methodological diversity including autobiographical inquiry (Joo, 2005) and retrospective narrative inquiry (Kim, N., 2007), research on school environmental education in Korea also needs to develop specific foci and themes for developing methodological frameworks in such ways that they offer novel insights and explanations into the formation and transformation of educational processes in accordance with social, cultural, and environmental changes.

By way of illustration, Kang's (2006) study specifically addresses a methodological strategy that can capture the pedagogical process in environmental education well, wherein Korean educational culture impinges on the ways in which teachers' pedagogical decisions are made. As an ethnographic case study, Kang used classroom observation as the main method, and this was designed to specifically highlight the problematic relationship between a teacher's pedagogic beliefs and institutional barriers through the theoretical notion of teachers' optimization behaviours. The term, "optimization in teaching behaviour", originally coined by Cho (2001), is a concept that penetrates the dynamics of classroom discourse, and has been widely used by qualitative educational researchers in understanding teachers' strategic behaviours regarding the ways that they attempt to manage or strike a balance between their own beliefs and their expected roles, as ascribed by a very competition-driven and rigid culture of education in Korea, with the purpose of achieving educational efficiency. Likewise, Kang's (2006) study provides rich and vivid accounts of environmental education in which a geography teacher's optimization of behaviour to meet students' actual needs led to constraints in introducing more innovative teaching methods.

However the idea of optimization is inevitably limited in interrogating the discursive processes involved in teachers internalising institutional and cultural norms and values. This is because when the analysis consistently separates the notion of structure and individual action, it also conceals the formative processes in which teachers begin to 'understand' something as demands or roles in a

rather taken-for-granted way. For example, processes in which a teacher's own 'beliefs' are shaped in the way that accommodation or coping strategies, rather than creative or innovative strategies, become key characteristics in understanding teacher's behaviour, are more likely to be coupled with, rather than separate from, induction or enculturation into the prevailing culture of schooling. As will be discussed in the next section, post-structuralist inquiry is concerned with demystifying such cultural processes by investigating the role of languages that impinge on the ways of becoming a teacher (e.g. Britzman, 1991).

Finally, research on the optional Environment subjects has addressed institutional barriers that work upon areas of the official curriculum of low curricular status. The utmost concern has been to address and reduce the entrance barrier for qualified Environment teachers owing to competition with other optional subjects and the unwillingness on the part of schools to adopt the subject because of perceived irrelevance to the dominant examinations frame. Eom *et al.*'s study addresses issues of teaching quality (Eom, Lee & Kang, 2004) in that even in the case where schools adopt the subject, it is taught by teachers without qualification (see Table 2-4). Regarding this, Kang's (2004) study offers empirical evidence on the difference in teaching responsibilities and practices between a fully qualified Environment teacher and a social studies teacher who also teaches Environment: it was observed that the qualified Environment teacher was better able to address environmental issues. Overall, such studies address the realities in which Environment is bound to be marginalised, and identify fundamental and practical strategies for 'expansion' of the adoption of the subject (CMEJ, 2003). Also, concerns about the identity of the subject such as the question around the 'aims' of the curriculum have become part of an ongoing debate (e.g. Jeung, 2004). Thus, while a 'mainstreaming' discourse has become imperative among scholars and teachers (Choi, 2006), critical voices call for the need to restore its innovative potential (Nam, 2005).

To date then, while there has been little research interest in the thinking and practice of Environment teachers, such research is expected to provide more in-depth analysis of the institutionalisation process for environmental education, through the enactment of the official curriculum, and in particular, where its reception often depends on the individual school's ethos. This idea underpinned the purpose of understanding the thinking and practice of Environment teachers in this study, in that it can further contribute to the theoretical discussions of 'teacher identity' by diversifying the nature of the concept in ways that address organisational or institutional issues concerning teachers becoming an 'environmental education teacher'.

Looking ahead, researching the phenomena of environmental education in Korea with a teacher's point of view to the fore needs to further address the role of culture in environmental education, not

only concerning ‘educational culture’, but also everyday practices related to environment that go unnoticed or remain taken-for-granted in research and practice. In relation to this, a comparative review of environmental education in Korea, China, and Japan helps highlight the dynamic political relationship between the government and teachers as not only a constraining but also an enabling factor for enhancing environmental education in schools in Korea (Suwa, 2005)⁵. This observation illustrates an interesting way of considering cultural perspectives that have for some reasons not been well addressed by researchers in Korea. More crucially, it can be taken further for narrative inquiry in this study to reflect on the idea of “which stories” are told of teachers, how to elicit such stories, and to consider further how to “contextualise cultural context” in research (see Chapter 4).

2.3. Toward research perspectives: two aspects of ‘environmental’ ‘education’

Thus far the discussion has focused on research perspectives and findings that are mainly from the field of environmental education. In further developing ideas about teacher identity as a primary concept for understanding teacher’s environmental education, this section engages with the discussion on research approaches to teacher identity (2.3.1) and ways of conceptualising environmental knowledge and curriculum with a focus on science education perspectives (2.3.2).

2.3.1. Significance of teachers’ life experiences

In the previous section I argued that researching environment-related teaching should consider teachers’ various personal, professional, social, and environmental identities (e.g. Payne, 2000; Hart, 2003; Barrett, 2007). Researchers have, for example, conceptualised teaching within a framework of learning that puts priority on ‘professional development’ (Guskey & Huberman, 1995), ‘reflective practice’ (Schön, 1991), and ‘lifelong learning’ (Day, 1999). Such notions in teacher learning research focus on the processes of identity seeking that lie at their core, and in particular, through which teachers may engage in a process of continuing reflection on who they are as teachers and what teaching is for, and, how they understand both. Therefore, teaching can be seen as an act necessitating ongoing identity-forming and negotiation processes, and it cannot be reduced to a body of knowledge and skills.

⁵ A similar point was made by a Korean academic in this field (Lee, 2006, personal communication).

This perspective on teaching is especially well suited to investigating the nature and characteristics of teacher's participation in environmental education as primarily motivated by their values, goals, and individuality. For example, Hart's (2003) study elaborates a methodology that highlights the importance of teachers' epistemologies, drawing attention to the nature of teacher knowledge as "an interplay of those personal practical theories on the one hand and the complex of the social, cultural, and educational context within which the individual lives on the other" (ibid., p.64). It is for this reason that a review of studies of teachers' personal and professional lives, and the ways in which teachers make sense of their experiences, can be useful in identifying foci and the scope for this research in ways that address the theoretical and educational issues around the notion of 'teacher identity'.

Identity is a 'core' concept in researching teachers' beliefs and knowledge in general (Figure 2-1; see also discussion in 5.4), as well as in investigating the realities of environmental education (see 2.2.1). What then are the major themes and approaches in developing research inquiries into teacher identities?

Richardson's work (1996) offers three categories of experience that influence knowledge and beliefs about teaching: personal influences, schooling, and formal knowledge; and these can be considered as, or further operationalised to, conceptualise 'contextual factors'. However, instead of listing elements of such experience, my key interest at this point lies in examining the various research approaches to investigating teacher identities, with a focus on three aspects: teachers' understanding of professional identities, teachers' personal theories and curriculum knowledge, and teacher voice. As such, ways of investigating teachers' life experiences relating to environmental identities and with respect to their contribution to constructions of professional identities of environmental education teacher are explored through reference to the studies that address this issue directly.

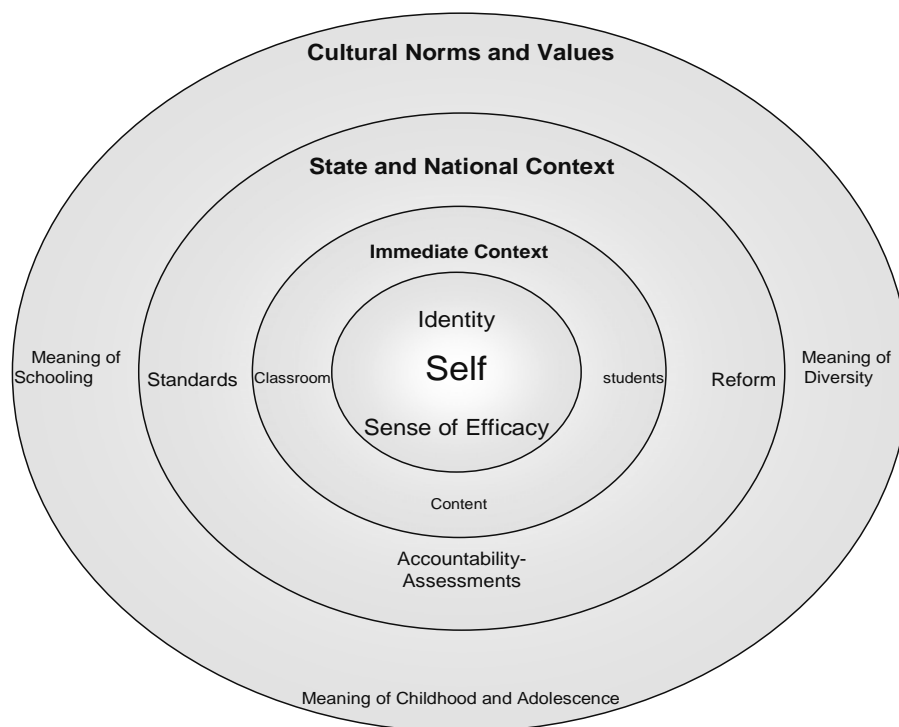


Figure 2-1 An ecological model of teachers' knowledge and beliefs (Hoy, Davies & Pape, 2006)

Earlier studies of teachers' careers sought to illuminate teachers' understandings of their professional lives as a legitimate research concern and form of knowledge that contributed to investigations of educational realities (see Carter & Doyle, 1996). In this work, teachers' socialisation was usually theorised as a window into teachers' developmental processes, for example, how a beginning teacher comes to terms with their institutional situation (e.g. Nia, 1986, in a British context). Hirsch's (1993) work taps into the teachers' perceived professional identities through analyses of autobiographical data, with respect to 'self-image and attitude', 'social and professional mobility', and 'vocation'. Hirsch proposes six ideal types of teacher identity, each of which represents different ways of perceiving and coping with professional demands: i) development, ii) stabilisation, iii) diversification, iv) problem, v) crisis, and vi) resignation.

Meanwhile, Woods and Jeffery (2002) specifically address the relationship between teachers' perceived self-concepts and assigned roles, by observing the ways in which individual teachers respond to changes in their working situation, often set by broader social and cultural restructuring processes ensuing from policy revisions and associated demands. Distinct research interests and various research approaches have emerged more recently in light of this. These include conceptual mapping of various research approaches to professional identity (Beijaard, Meijer & Verloop, 2004), an examination of the nature of stable or fragmented selves corresponding to variations in

life and working situations (Day, Kingston, Stobart & Sammons, 2006), and an integration of 'emotion' as a crucial dimension of teacher identity (Zembylas, 2003). These frameworks can help make sense of teachers' lives and careers by illuminating the situated and structural contexts of individual teacher's experiences within broader socio-cultural milieu, in terms of dynamic processes of identity construction and reconstruction (Coffey, 2001).

Within such diversification, research that approaches teachers' work and careers with respect to teachers' 'personal' experiences and understandings has helped challenge conventional models of career and teacher development. Feminist scholars have been particularly interested in this (Acker, 1995-1996). For example, Biklen (1995) has viewed women teachers' career choices in not becoming administrators as demonstration of a means of 'resisting' normalised practices in career building by persisting in their own ideas about what it means to be a 'good teacher'. Acker's (1995) study of the discontinuities in English women teachers' careers captures their sometimes fragile quality. In such a way, a focus on different kinds of personal identities and the cultural politics of identity, such as in terms of race, sexuality, and ethnicity (Troyna, 1994), have also contributed to critical inquiries into the sites for teacher identity construction in the way that the notion of 'identity' itself is made meaningful, and can be questioned and therefore challenged.

At this point, environmentalism can also be perceived as providing identity resources for teacher professionalism either through the form of response to policy demands (as discussed in 2.1) or a teacher's personal motivation. In the case of the latter, that is to say, when environmental identity becomes or is intrinsic to a teacher's core conception in defining their work as a teacher, we should ask to what extent and in what ways teachers' ways of thinking and acting as an 'environmental education teacher' can be understood in terms of teacher professionalism, rather than just regarded as a 'personal' disposition? By framing the teacher's environmental education in this way, inquiries into teachers' environmental identities can contribute to the theorising of teachers' professional identities. In so doing, more in-depth understandings about how teachers' environmental identities meet discourses of pedagogy and professionalism are needed, as was pointed out as gaps in the Significant Life Experience literature by researchers in the environmental education research field (e.g. Payne, 1999b). For example, rather than focusing on identifying the kinds of significant life experience that teachers claim to be formative in their participation in environmental education (Palmer et al., 1998), research might better examine ways in which those experiences inform or are translated into actual curriculum practice. In such inquiries, the focus may lie with identifying elements of inspiration and passion for 'professionalism' not only in the sense that environmental education is necessary for pupil learning, but also in the way that participation in environmental education creates dynamics in teacher identity constructions in which more conventional or

dominant conceptions of a teacher's role are examined and new sources of professionalism can emerge (see Chapter 5).

It is in this vein that teachers' autobiographical narratives or self-understandings can be used as useful data for research oriented towards valuing and investigating teacher epistemologies and thinking processes, particularly in theorising the nature of teachers' knowledge and curriculum practice. Clandinin and Connelly's theory of 'personal practical knowledge' has been particularly influential in stressing the legitimacy of teachers' experiential knowledge in constituting teaching and learning practice. They state, it is:

A term designed to capture the idea of experience in a way that allows us to talk about teachers as knowledgeable and knowing persons. Personal practical knowledge is in the teacher's past experience, in the teacher's present mind and body, and in the future plans and actions. Personal practical knowledge is found in the teacher's practice. It is, for any teacher, a particular way of reconstructing the past and the intentions of the future to deal with the exigencies of a present situation. (Connelly & Clandinin, 1988, p.25)

They also propose the metaphor of a 'professional knowledge landscape' in understanding contexts in which teachers shape their own understandings of teaching, concerning various components and influences, including people, place, and things (Clandinin & Connelly, 1995, pp.4-5). This view of curriculum challenges the traditional 'transmission' model of curriculum implementation. In this respect, Olson (2000, p.171) argues curriculum to be a "multi-storied process". For her, the ways in which student teachers tell their own experiences of curriculum - their "lived curriculum" - contain "a variety of characters, settings, and plot lines that shift and change over time". In particular, three of her student teachers' narratives reveal 'tensions' between curriculum stories "written for" teachers and stories "lived by" teachers (ibid., p.172), illuminating respectively, temporal borders between a fixed curriculum and teachers' resistance to it, a sense of authority as a curriculum maker, and a cooperative relationship with other teachers. In this way, all of the stories represent the unique experiences of teaching, and the processes in which individual student teachers become the author or narrator of their own or others' curriculum stories. But it is also noted that stories that "should be" preclude stories that "could be", that is, recognising student teachers' lack of awareness of the need to discuss the possibility of different versions of stories and the stories themselves (ibid., p.181).

In examining the nature of teachers' curriculum knowledge and practice, narrative researchers have also noted the importance of teachers' narrative competence. For example, Gudmundsdottir (1991,

p.214) understands teacher curriculum stories as consisting of pedagogical content knowledge that is shaped through a narrative way of knowing and their expressions. By analysing the narratives of two experienced social studies teachers in terms of their ‘making’ and ‘telling’ of their own stories, some elements of good stories such as continuity, events, and characters, are proposed. Also, reflection and transformation are understood as the tools for re-configuring teachers’ curriculum narratives (Gudmundsdottir, 1995). In this view, narratives of teaching are basically understood as the making of meaning, like “writing a story”, and “the understanding of teaching is like arriving at an interpretation of a story” (Gudmundsdottir, 1991, p.217, by using Polkinghorne, 1988, p.142). In a similar vein, Carter (1993, p.7) taps into the narrative structures of teachers’ curriculum knowledge in ways that underscore the interpretive and inventive processes involved in teaching. Her work on novice teachers’ ‘well-remembered’ events then illuminates some fundamental processes in how teachers learn to teach by investigating their initial and changing preoccupations with curriculum issues, classroom management, methods, motivation, individual students, diversity, self and other, and their stances on such events (Carter, 1994, p.238).

To summarise, this approach to a teacher’s personal theory and curriculum knowledge is grounded in the belief that teaching draws heavily on the teachers’ personal resources, values, and life experience (Elbaz-Luwisch, 2007, p.364). With a perspective of teacher as agent of educational practice in which a teacher’s reflection on his or her own teaching act is seen as a key to professional development, this also gives significance to teacher’s participation in environmental education whereby contexts of learning to teach or environmental identity resources usually lie outside the boundaries of school education. Indeed, asking “why” teachers engage in environmental education entails inviting teachers to make sense of tacit thinking and knowledge in relation to their moral sense of responsibility, and in Hart’s (2003, p.98) research on Canadian teachers, it involved teachers telling their stories in which elements of personal practical theories as well as some underlying value systems are embedded.

However, critiques of personal practical theory point out the tendency towards individualism, that is without necessarily implying a notion of community, both as a source of narrative forms and as an audience (Carter, 1993; Carter & Doyle, 1996; also Chapter 3). Hart (1996) has also been concerned with the difficulties of developing teachers’ stories as ‘authentic’ expressions of teachers’ values (see 3.1.3).

The challenge here then is representational, in valuing and legitimatising the ‘personal’. In this regard, the ‘critical’ lines of research inquiry into teacher thinking raise methodological issues with respect to representing teachers’ voices. While concurring with the contribution of this strand of

research to restor(y)ing the significance of teacher's own interpretations, particularly the value of personal practical knowledge, Britzman (1991, p.67) also cautions in a more critical tone, that "when practices become a text, they must be read as representations of particular discourses that implicate the voices of teachers and researchers in larger interests and investments".

Likewise, Elbaz (1991) criticises some of the modernist and positivist assumptions that underlie narrative and autobiographical inquiry including the earlier work of Connelly and Clandinin. Instead, by shifting the focus of narrative from 'unity' to 'fragmentation', from a poststructuralist perspective she argues that what needs to be examined is the place "the discourse of teacher thinking research allow[s] for possible subjects, and who can assume these subject functions?" (ibid., p.7). By focusing on the subject role of teachers, she argues that the prevailing discourse of 'exemplar', or 'expert' teacher results in the assumption that teacher knowledge can be replicated, hence transmitted to novice teachers, and consequently hides the personal, idiosyncratic and tacit dimensions of knowledge. Re-reading Aokie's (1983) study of her own experiences as a teacher enabled Elbaz to further illuminate the value of 'ordinary teacher' discourse in giving significance to teachers' own creations of meaning.

This perspective, however, in no ways implies that all teacher narratives are of equal value or offer grounds for insight for research, theory or practice. Rather, considering the ordinary teacher as 'subject' suggests seeking 'extraordinaries' in teacher's work by investigating patterns and forms in teacher's knowledge that may transcend those of "given" social, cultural, and historical contexts (Elbaz, 1991, p.9). In so doing, methodological considerations are suggested in ways that faithfully express teachers' tacit moral and critical voices by attending to non-linearity, integration, patterning of complexity, personal meaning, and embodiment that characterise narratives of teacher knowledge. On the whole, this take on teacher narrative aims to 'give' voice to teachers, whereas narrative approaches to teacher's curriculum knowledge such as Gudmundsdottir's are more concerned with examining narrative characteristics and structures developed through a teacher's ongoing reflection as a form of teacher knowledge.

Also, while Elbaz seems to put faith in the potential of teachers' voice for seeking "positive" aspects of school education and culture informing teacher's work (Elbaz, 1991, p.15), Britzman's focus lies in the constraining role of language and teacher subjectivities as both enabled and constrained by discourses. By examining discursive practices in which student teachers came to be involved in "negotiating past and present demands", in view of the "underlying values which coalesce in one's institutional biography" (Britzman, 1986, p.443), Britzman argues that teachers learning to teach is largely impinged by three "cultural myths"; that are, "everything depends on

the teacher”, “the teacher as expert”, and “teachers are self-made”. It is then suggested that becoming a teacher is not an ideology free process; therefore, teachers’ personal practice knowledge or self-concepts acquired through such a process should also be sites for critical examination as they are discursively constituted in the teacher’s institutional biography.

Therefore, in re-conceptualising teacher identity, for Britzman, being and becoming a teacher are not solely a matter of socialisation as a functionalist would argue, nor a subjective process; instead, they should be seen as dialogic processes in which teaching experiences are structured and restructured within contradictory realities and competing ideologies (Britzman, 1991). Thus, it is argued that teacher identity should also be examined in terms of “a provisional, contradictory, and multiple understanding of subjectivity as both individual and social,” (ibid., p.71) that is, in terms of a dialogic understanding. In the case of teachers, it requires a moving away from institutional biography that conforms to normative practice of teaching, and how such experiences become lived, i.e. “practice makes practice”, whereby multiplicity in meanings of pedagogy and professionalism is suppressed, toward insights into the dynamics of biography, as both given and possible relationships between biography and structures.

While poststructuralist perspectives inform the ways in which dominant discourses that impinge on the very meaning-making processes, i.e. teachers’ ‘personal’ theories, can be critically examined and challenged (e.g. as ‘cultural myths’), further examination of the changing relationship between discourses and a teacher’s understanding of their professional identity also needs attention in order to understand the connections between theory and practice. In this respect, a recent study by Alsup (2006) offers insights into such a dynamic process, by examining the way in which student teachers become able to identify and possibly resist the institutional discourses that impinge on their interpretations of teaching experiences. She firstly identified five types to their stories of individual experience: i) narratives of tension, ii) narratives of experience, iii) narratives of the embodiment of teacher identity, iv) narratives about family and friends, and v) borderland narratives. Among these, narratives of ‘tension’, taken to represent student teachers’ identity struggles, are further examined in terms of personal ideologies vs. professional expectations, and university knowledge vs. real-world knowledge. Living with these tensions, however, Alsup observed that, student teachers became able to proficiently use “multiple discourses simultaneously (professional/personal, student/teacher, academic/non-academic)” (ibid., p.57).

Poststructuralist thinking also inspired environmental education researchers to address multiple discourses of identities of researchers, educators, and learners in relation to a variety of issues including gender, body, or ability (Gough & Whitehouse, 2003; Newbury, 2003; McKenzie, 2004;

Barrett, 2005). In the case of teacher identity, these inquiries have been concerned with examining issues about how some environmental education approaches may reinforce the dominant discourses of the teacher's role, e.g. of the 'proper science teacher', and how a teacher's lived experiences become discursive sites where a teacher can take up available subject positions that construct different meanings of what possible environmental education practice might be in various contexts.

Such work suggests that a poststructuralist framework for analysing teacher identity can be useful in pushing the boundaries between what is possible and what is not impossible in teachers' work by reconceptualising teacher agency as dialogically constituted within multiple discourses. It can be distinguished from other approaches by its distinct interest in subjectivity (rather than identity) that is discursively produced as effects of power relations. For example, Day *et al.* also develop an analysis of teachers' personal and professional identity as key concepts for investigating teacher effectiveness over the phases of career (Day, Kingston, Stobart & Sammons, 2006). They share a concern with poststructuralism in that the research addressed the issue of teacher identities by focusing on the discursive dynamics between reform contexts restructuring teacher professionalism and individual teachers' sense of personal and professional identities in the British context. Their analysis of teacher interview data found teacher commitment and resilience as key components to sustaining teacher effectiveness in teachers' own contexts and approaches, leading to the conclusion that policy supports are needed that can nurture these as being a necessary condition for teacher effectiveness.

However from a poststructuralist point of view, there are many issues to critique. For example, the discourse of school effectiveness *per se* remains under-interrogated, and then how particular subjectivities are produced by discursive frames of related research project and policy initiatives, or how a teacher's perceived effectiveness is mediated by multiple discourses. Therefore, while the research strongly supports the notion that "teachers matter" in school education (Day, Sammons, Stobart, Kingston & Gu, 2007), and also contributes to theories of teacher identity that incorporate teachers' lives into the research framework (an "emerging field of study", Goodson & Hargreaves, 2007, p.xiii), poststructuralist critiques can still be important to attempt to reconceptualise teacher 'voice' in ways that trouble and interrogate meanings that teachers attribute to matters of perceived effectiveness, and the quest for possible and other meanings.

In summary, this section of the literature review has discussed research approaches to teacher identity with respect to ways of inquiring into teachers' lives, epistemologies and voices, with a view that inquiries into teachers' environmental education experiences can both benefit from these and contribute to further theorising. Importantly, methodological challenges were stressed in

representing teachers in ways that matter to themselves as well as enable critical examination into the educational realities. These need to be further discussed by engaging the question of what sort of ‘data’ can represent teacher’s voice more authentically and critically (as in Chapters 3 and 4).

2.3.2. Significance of environmental knowledge and curriculum: focus on science

The previous section of the literature review focused on aspects of ‘education’ in environmental education research by addressing epistemological concerns around teachers’ making sense of environmental education. In this section, ‘environmental’ aspects are examined in ways that illuminate ‘the contents’ of teachers’ curriculum knowledge as acquired and learnt in close relationship with a teacher’s identity construction processes as an environmental education teacher. There will be many different ways of conceptualising teachers’ environmental knowledge, and the review of research on teachers’ knowledge and conceptions of environment and sustainability including the topics such as biodiversity, global warming, and ozone layer in 2.2.1 (e.g. Summers, Kruger, Mant, & Childs, 2000; Khalid, 2003) indicates that such knowing processes and knowledge are not easy to capture. The problem is partly associated with the fact that assumptions that underpin epistemology are varied, as illustrated by the construction: knowledge ‘about’, ‘of’, and ‘for’ the environment, each of which can be associated with, even underscored by, particular educational values and environmental ideologies (Lucas 1979; Fien & Gough, 1996). Variety in teacher beliefs and orientations about environmental education also underscores this point.

Another predicament in conceptualising an environmental curriculum is that when it comes to teachers’ sense-making of the environment, not only knowledge and perceptions that are directly related to pedagogy and curriculum, but also a teacher’s own personal everyday experiences of living in/with the environment and their dealings in relation to environmental issues are essential in forming teachers’ perceptions about what counts as environmental knowledge and curricula. While this complicates even more the matter of inquiries into of what an environmental curriculum and pedagogy might consist, the study’s focus lies in investigating what are possible and available to teachers when they intend to include an environmental curriculum in their subject teaching. In so doing, I have focused on perspectives from science education, given the study’s design of empirical inquiries that are primarily concerned with science teachers’ environmental education and environmental curricula that mainly addresses science-related knowledge and issues (particularly in Chapter 7). Although the discussion will inevitably draw upon the literature mainly within the field of science studies and science education, the intention of this part of the literature review is to

identify and examine the extent to which discourses of science and science education enable and constrain teachers' envisioning of their professional role in legitimatising knowledge and curriculum, in that epistemological issues concerning science raised by the literature are directly and indirectly related to pedagogical issues about how we know and learn about the 'environment' and 'nature', i.e. how meta-narratives of science shape our understandings of 'nature' and 'environment'.

Traditionally in environmental education, scientific knowledge has been given dominance (e.g. UNESCO-UNEP, 1978). However, the legitimacy of science has been critically examined in many disciplinary areas (e.g. Kuhn, 1962; Midgley, 1992; Soper, 1995), in terms of the ecological crisis (Beck, 1992), and in mobilising the discourse of public engagement with science-related issues and scientific literacy for citizenship as a way of addressing environmental and sustainability issues (Irwin, 1995; Osborne, Duschl & Fairbrother, 2002). More specifically to environmental education, Stables (2001) addresses the problems of 'language' that underpins different 'truths' about the environment. In his view, scientific realist positions that underpin scientific knowledge about the environment such as scientific ecology cannot claim absolute legitimisation, nor can other positions such as critical realist, poststructuralist, and relativist. Therefore, it is argued that the role of teachers should include considering a pluralistic approach by integrating different dimensions of environmental literacy - functional (scientific knowledge based), cultural, and critical literacy (Stables, 1998). Scott and Gough (2003, p.27) also propose maintaining and exploring multiple perspectives of environmental learning. Their thesis is that "learning is central to the relationship between society and nature", in assuming that society and nature change in co-evolutionary ways (ibid., p.8) (see Figure 2-2). Their case studies focus on analysing learning 'across' competing perspectives in a context of risk and uncertainty - 'environmental meta-learning'.

Stables, and Scott and Gough, share the view that different kinds of 'literacy' play a part in environmental learning processes. It is in this vein that this study argues that the discourses of the role of science that are geared to fostering different 'kinds' of scientific literacy should be considered in order to transcend a dualistic division between the contribution of scientific knowledge and other forms of knowledge in social and human sciences to environmental learning, and to integrate environmental and sustainability issues into the main curriculum area of education. In so doing, there is an imperative to examine developments in perspectives from science studies and science education that enable different and alternative ways of designing and fostering science/environmental learning, and their implications for interdisciplinary curricular development.

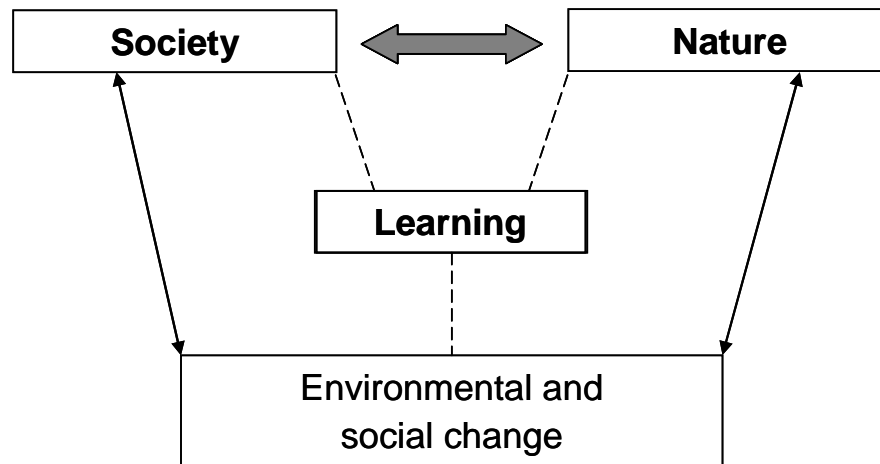


Figure 2-2 Relationships between society, nature, learning and change (Scott & Gough, 2003, p.9)

To begin with, it is necessary to review the discourses of science in relation to environmental and sustainability issues at an epistemological level⁶. As mentioned above, scientific knowledge is not viewed as possessing an absolute authority in providing diagnoses and solutions to environmental issues. Instead, in recent policy discourses, science and technologies have been given the role of ‘mediators’, in gearing the nature of scientific work and endeavour toward reflexivity throughout all the processes in which it is shaped. “The public value of science” discourse in the UK (Wilsdon & Willis, 2004; Wilsdon, Wynne & Stilgoe, 2005) is a prime example found in public initiatives, concerning the development of a framework for describing, debating and organising the contribution of science and technology to wider social goals, in ways that address the issues of communication and engagement between scientists, policy makers, the public and other related stakeholders as intrinsic to the processes in which scientific work is shaped.

The emergence of this new discourse can be traced to policy problems in dealing with the controversial issues that progress in science and technology may entail, for example, in the way that they provoke intense public debate on risks and ethical responsibilities (e.g. UK House of Lords Select Committee on Science and Technology, 2000). Example topics include: climate change, nano-technology, and stem-cell research, which all give rise to considerable degrees of uncertainty and unpredictability. Traditionally, environmental and risk communication approaches assumed a ‘deficit-model’ in public perception in that ‘enlightenment’ was the priority in educating the public, through distribution of expert knowledge. However, critics argued that such a view

⁶ It is beyond the scope of this study to engage in the discussion on the varied traditions of philosophy of science, science studies, sociology of science, and so on, which are contested and interdisciplinary in nature (for a critical appraisal of the field, see Fuller, 2006).

excludes the public's interests and participation in decision-making processes (Smith, 1988). Therefore, in moving away from models of control and prediction posited by risk assessment, towards broadening social influences that 'shape' science and technology, proponents of the public value discourse believe in a more proactive and forward-looking, 'up-streaming' approach (see Jackson, Barbagallo & Haste, 2005). The key presupposition in achieving this approach is to ensure public engagement and participation throughout the trajectories of decision-making in science and technology innovation (Wilsdon, Wynne & Stilgoe, 2005, pp.33-34).

The implications of this new discourse are paramount: it enables an opening up of discursive spaces regarding the languages of legitimatisation, and can foster more reflexive and democratic processes regarding the rethinking and redefining of the very meaning of science and how and why scientific knowledge can occur, and therefore, for instance, involve the production of 'environmental knowledges' (Irwin, 1995).

In fact, the role of science as a tool for facilitation in social debates has also been examined in relation to dealing with environmental issues (e.g. Wynne, 1992; Diduck, 1999). Ozawa's (1996) analysis of the ways in which decision makers in an environmental conflict situation assign authority to science has identified four powerful roles for science discourses: that is, science is positioned as discovery, as a mechanism of accountability, as a shield, and as a tool of persuasion. In so doing, Ozawa argues for the demystification of the tenets of logical positivism, which may mask a social and political process that is in fact fundamental to environmental disputes. Instead of entirely refuting the role of science, however, he proposes an alternative role for science that enables all stakeholders to not only engage in enhancing their understandings of the nature of scientific issues, but also to discuss what kinds of knowledge they need to reduce conflicts. What is needed is not only a preservation of the legitimacy of scientific knowledge as a means to advancing intellectual thought, but also a new role: helping develop a constructive understanding of multiple perspectives in an environmental conflict situation (Ozawa, 1996, p.229). It is the value of reflexivity that also underpins the more recent popularised idea of sustainable development. Indeed, 'learning' has increasingly been argued to be a key concept in environment- and sustainability-related agendas in which the role of scientific knowledge is considered to be reflexively reformulated in correspondence to evolving meanings in other discourses of terms such as 'governance', 'community', 'economics', etc. (Gibbons, Limoges, Nowotny, Schwartzman, Scott & Trow, 1994; Nowotny, Scott & Gibbons, 2001)⁷.

⁷ For example, Luks and Siebenhünerb (2007) incorporate the discourse on the role of science to a social learning framework for sustainable development governance, by drawing upon novel perspectives such as mode-2 science, co-production of knowledge, sustainability science and post-normal science. Other case studies include: Reed, Fraser &

Also, from an ‘environmental learning’ perspective, conceptual frameworks for environmental knowledge have been developed, examining the role of metaphors that organise our thinking and experience in relation to human-environment interactions, exploring learning opportunities that such various metaphors afford, with the ‘natural capital’ metaphor and other root cultural metaphors as exemplars (for example, *Environmental Education Research*, 2005, vol. 11 (1)). Equally important, as contributors to the discussions on ‘natural capital’ addressed, is the examination of the role of learning in deconstructing and reconstructing current metaphors and normative narratives that they produce. It is in this vein that the new discourse on the role of science and scientific knowledge needs to be critically examined. While it clearly posits a new metaphor of science as ‘facilitator’, to what extent can this perspective foster new ways of thinking about science curriculum and learning as not just matters of acquiring and instructing the kinds of knowledge that are currently known, but also matters of facilitating learning about various conceptual frameworks (e.g. metaphors) or discourses and narratives that a plurality of science/environmental ‘knowledges’ necessarily sets out? How can these novel perspectives enable different conceptions of science education and learning in schools?

It is for this reason that there is a need to examine the ways in which the current discourses on science education take on or ‘translate’ novel perspectives on the role of science. In fact, this new discourse on the role of science is not exclusive to the domain of school science education, and related languages abound in the rhetoric of ‘scientific literacy’ in that the scientific literacy movement in many countries has been primarily concerned with redirecting the goal of science education toward preparing literate future citizens who are able to deal with the increasingly complex characteristics of science and technology in everyday life contexts (The UNESCO *Project 2000+*, Power, 1994; *Science For All Americans* in USA, AAAS, 1990; *Beyond 2000* in UK, Millar & Osborne, 1998). Although it should be recognised that histories of the concept have witnessed unsettled debates on the aim and definition of scientific literacy (see Jenkins, 1997; DeBoer, 2000; *Educational Philosophy and Theory*, 2006, 38, 5), the focus here in beginning this discussion lies with the potential that the key ideas of scientific literacy might benefit environmental learning by further operationalising their pedagogical values. To achieve this, two theoretical underpinnings of scientific literacy – ‘Nature of Science’ (NOS) and citizenship education are examined and followed by two other frameworks for pedagogy that reflect these conceptual bases – teaching socio-scientific issues and the role of languages.

Dougill, 2005; Fraser, Dougill, Mabee, Reed & McAlpine, 2006; Rist, Chiddambaranathan, Escobar, Wiesmann & Zimmermann, 2007.

To begin with, the conceptual development of ‘Nature of Science’ (NOS) has fed science-related environmental and sustainable issues into teaching and learning approaches by stressing the importance of grappling with epistemologies of science – including inductivism, falsificationism, positivism, empiricism, rationalism, realism, constructivism, anti-realism, etc, science as a way of knowing, or the values and beliefs inherent to the development of scientific knowledge. These are at the pinnacle of the key concerns in the new discourse of the role of science (Lederman, 1992; cited in Abd-El-Khalick & Lederman, 2000, pp.665-666)⁸. For example, Monk and Osborne (1997, p.421) proposes a history and philosophy of science curriculum that will consider:

- What is a scientific theory?
- What is scientific knowledge?
- What is the role of experiment?
- How do scientists know?
- How have scientists “discovered” new knowledge in the past?
- A limited set of the important concepts of science, for example, electricity, the Earth in space, the periodic table, and photosynthesis.
- How does scientific knowledge progress?
- What is the impact of science and technology on society?
- The assessment of risk.

To put it simply, teaching about NOS means putting greater emphasis on knowledge ‘about’ science – epistemology of science, rather than knowledge ‘in’ science, or the ‘contents’ of scientific theories (Kolstø, 2001, p.292). Duschl and Osborne (2002, p.40) argue the need to teach about how we know and why we believe, i.e. science as a way of knowing, and propose the use of ‘argumentation’ as crucial for achieving such a pedagogic purpose. The proposal more specifically addresses four areas of pupils’ understanding that the use of argumentation can contribute to: conceptual understanding, investigative competence, understanding of epistemology of science, and understanding of science as a social practice (Driver, Newton & Osborne, 2000).

In supporting this idea, Osborne (2002) points out that the priority given to laboratory-based empirical activities over knowledge acquisition as often advocated by science educators, albeit with

⁸ In fact, changes in conceptions of NOS have mirrored major shifts in the philosophy, sociology, and history of science, evoked by Kuhn’s seminal work, “*Structure of Scientific Revolution*” (Kuhn, 1962), from a concern with a normative account of scientific knowledge to that of a sociological and cultural element of scientific endeavour (Abd-El-Khalick & Lederman, 2000). In spite of the historical disputes on the question of whether definite meanings of NOS can exist, consensus has been sought with respect to the pedagogical purposes (Alters, 1997; McComas & Olson, 1998; Collins, Osborne, Ratcliffe, Millar & Duschl, 2001).

great benefit to learning, may in fact lead to a narrowing-down of achievements in scientific literacy. This is because it can limit the opportunities for pupils' learning of science-related 'languages' such as the nature of scientific argument and consensus among scientist communities, of which 'literacy' presupposes the recognition of its centrality. But how can teaching about science be achieved given the depth and breadth of philosophy and history of science?

From the most modest level onwards, Matthews (1998) argues that every science teacher should be able to elaborate philosophical deliberations on issues of epistemology and metaphysics, so as to encourage pupils' interest in and inquiries of ontological and epistemological questions, even if he or she is not proficient in all the propositions and concepts, or debates. Despite its shortcomings, such a view of scientific literacy discourse, in foregrounding the ability to address meta-understandings of science from more critical views of the relationship between science and people, does require more *agency* on the part of learners. For Irwin (1995), even from an idealised sense of the discourse, it can be argued that learning that the role of science is actively reformulated and redefined through social processes is vital, and learners and teachers should be encouraged to rethink and challenge the ideological narrative of science-centred worldview that science 'enlightens' people. As core elements of a 'citizen science', these goals can offer a citizenship education premised upon science education in such ways that science and citizenship can be merged as an area of curriculum practice.

For example, the Citizenship curriculum in the UK is arguably directly concerned with the integration of values issues into teaching about controversial issues (QCA, 1998; Davies, 2004; Oulton, Day, Dillon & Grace, 2004). Also from science education perspectives, several studies provide theoretical grounds for teaching about citizenship. Jenkins (1997) for example, builds ideas about 'public understanding of science' through a review of a wide range of related studies. The significance of this study lies in the valuing of the ordinary citizen's thinking about science: their interests in, knowledge of, and attentiveness to scientific and technological issues in their own lives from the perspective of 'citizen science' (Irwin, 1995).

Another framework for citizenship proposed by Ryder (2001, p.7) is grounded in ample evidence on how people actually learn science in their practical situations. The study is based on a review of 31 case studies of individuals not professionally involved with science interacting with scientific knowledge and/or science professionals, with the question, 'what knowledge of science is relevant to those individuals engaging effectively with science?', or in other words, to investigate the 'functional scientific literacy' that is needed by individuals to enable them to function effectively in specific settings (ibid., p.3). The analysis identifies the main areas of science understanding

featuring in the studies: subject matter knowledge, collecting and evaluating data, interpreting data, modelling in science, uncertainty in science, and science communication in the public domain. The arrangement of the areas shows the priority of knowledge ‘about’ science over knowledge ‘in’ science, arguably the reverse of the situation with the school science curriculum, and also supporting the ideas of NOS. Based on this understanding, Ryder further develops learning aims that primarily consider the epistemology of science, by providing contextualised examples rather than explicitly teaching about it, an approach which he claims better serves the aims of citizenship education by focusing on students’ actions in science-related contexts (Ryder, 2002, p.646).

Meanwhile, Kolstø (2001) has focused more directly on the science dimension of controversial socio-scientific issues. A set of eight topics are discussed under four main headings: *science as a social process* (topic 1: “science-in-the-making” and the role of consensus in science), *limitations of science* (topic 2: science as one of several social domains; topic 3: descriptive and normative arguments; topic 4: demands for underpinning evidence; topic 5: scientific models as context-bound), *values in science* (topic 6: what counts as scientific evidence; topic 7: suspension of belief), and *a critical attitude* (topic 8: scrutinize science-related knowledge claims). Such a list illustrates a shift away from the scientific objectivism and naïve realism that have underpinned modern science education as means for seeking ‘certainty’ as a desirable pedagogical outcome and, therefore, the need to defend an often over-simplified definition of objectivity in grounds of pedagogical appropriateness (Fendler & Tuckey, 2006).

Therefore, arguably both NOS and citizenship education afford a significant shift in the focus of pedagogy from the acquisition of knowledge itself, toward social processes in which scientific discourses are formed. Then this transition, at least theoretically, allows a teacher’s role as a facilitator in forming more pupil-centred discourse on science and the role of scientific understanding in dealing with everyday practical concerns or controversial issues in the way that pupils come to be engaged in epistemological inquiries into science. But pedagogical benefits and limits need to be further examined in terms of real teaching and learning contexts.

These trends in the development of key ideas about scientific literacy have been reflected in the pedagogical approaches used in addressing socially controversial scientific issues. For example, Zeidler *et al.*’s (2005) research interest lay in integrating controversial issues into scientific literacy, as a pedagogic tool for fostering pupils’ personal, cognitive, and moral development (Zeidler, Sadler, Simmons & Howes, 2005). Oulton *et al.*’s (2004) study pays attention to the nature of ‘controversy’ itself, including ideas about interest, value, scientific evidence, and argument (Oulton, Day, Dillon & Grace, 2004). In so doing, they propose an active role for teachers, by exposing

pupils to elements of the nature of controversy, as opposed to the traditionally advocated norm of ‘teacher neutrality’ (Kelly, 1986). Notably, the learning focuses on pupil engagement with issues that include ‘scientific evidence’ as one of the many components that characterise controversy; the evidence is not privileged nor an entirely independent factor that lightens the teacher’s burden, as if there were a dichotomy: to be either neutral or committed. Instead, a teacher’s role will be more concerned with how to foster pupils’ ‘literacy’ – reading, interpreting, and writing skills to deal with issues and composing their arguments. Revisiting Cotton’s (2006) study in 2.2.1, this implies that the tensions between teachers’ beliefs about liberalist pedagogy and the value-laden nature of environmental education can be eased as the main role of the teacher shifts from changing pupils’ values to enhancing pupils’ ability to critically reflect on their value assumptions.

In this respect, other studies offer some empirical evidence on how learning can be fostered by investigating pupil understandings and skills. Jimenez-Aleixandre and Pereiro-Muñoz’s (2002) analysis of pupils’ arguments used in decision-making processes in environmental management illuminates pupils’ abilities to process and use and respond to different sources of information and authority. The outcomes showed that there was a great amount of concordance between pupils’ and experts’ arguments not only in content, but also in value judgements. The reason offered for such concordance was the characteristics of the ‘authentic’ activities that the pupils engaged in, in their similarity with the actual contexts of environmental management. This facilitated pupils’ ability to integrate conceptual knowledge and values (ibid., p.1188). This supports Grace and Ratcliffe’s (2002) study of pupils’ use of biological concepts and values related to conservation management, through which it is argued that science teaching needs to develop approaches that integrate scientific concepts and values that are often difficult to clearly separate, rather than solely focus on the former. Although the question remains as to whether the discourse of pupils’ understanding of science should be congruent with that of academics or experts, and whether congruency should be the criterion for judging the value and outcomes of the learning processes that can arise, it should be noted that Weinstein (2006) criticises the learning objectives on the NOS, as these typically position students as scientists, and in so doing, reproduce an image of science without the artistry, aesthetics, and professional biases which are apparently necessary for scientists’ work, and which can engage pupils in ‘real-world’ contexts that can trigger pupils’ rethinking of the role of science in dealing with complex social issues.

In this regard, more research should examine various actual teaching and learning situations in order to build ideas about pupils’ learning processes and characteristics when they are exposed to epistemological issues. For example, Sadler *et al.*’s study (Sadler, Chambers & Zeidler, 2004) of student conceptualizations of the nature of science in response to climate change issues addresses

students' lack of ability to read and analyse data, highlighting the empirical nature of science, amongst other aspects of NOS, that might also include social embeddedness and tentativeness, and that issue-based science learning demands that pupils acquire more practical inquiry skills.

Finally, as suggested in some of the literature above, the role of the languages that are used in science texts is brought to the fore in developing pedagogical approaches to teaching about NOS and socio-scientific issues. But this is not new in that supporters of teaching about the history of science have raised criticisms about the conventional language of the science textbook, in that it is often full of abstract terms and written in a dry style. Instead, they propose the use of stories and narratives to help students organise their knowledge into explanatory frameworks (Kubli, 2005; Klassen, 2007). *Science for Public Understanding* (SPU)⁹, the newly developed school subject in the UK that includes an explicit focus on NOS, strongly stresses the use of language by adopting the use of 'explanatory stories'. This approach is concerned with the underpinning idea that "understanding is not of single propositions, or concepts, but of inter-related sets of ideas which, taken together, provide a framework for understanding an area of experience" (Millar & Osborne, 1998, p.13).

Solomon's (2002) examination of the features of good science stories provides theoretical underpinnings here. From Ziman's (2000) and Bakhtin's (1981) theories, it is understood that the characteristics of the language of science are not purely objective in a positivist sense, but inter-subjective in that communities of scientists constantly pursue a consensus about scientific knowledge. Solomon's interest was in the use of science stories, especially the ones written for children in the way that they are encouraged to elicit subjective meanings and empathy. Another aspect in the contribution of the inter-subjective theory to learning lies in the potential for fostering communication skills in dealing with ethical issues and decision-making process in a conflicting science- and technology-related context (Solomon & Thomas, 1999). This approach to science language is distinct from 'argumentation'-based approaches as suggested by other science educators (Duschl & Osborne, 2002), of which the overt rational framework might exclude the student's own use of story (cf. Norris, Guilbert, Smith, Shahram & Phillips, 2005).

⁹ SPU is an AS level curriculum that has replaced the STS curriculum since 2000. Its main structure is composed of science explanations (science content), teaching topics, and ideas-about-science. 'Ideas-about-science' consists of data and explanation, social influences on science and technology, risk and risk assessment, causal links, and decisions about science and technology. The coursework consists of two components: study of a topical scientific issue, and a critical account of scientific reading (Osborne, Duschl & Fairbrother, 2002).

Meanwhile, from the perspective of narrative theory, Milne (1998) develops a semiotic circle framework consisting of event, text, and interpretation, for examining science stories, especially historical narratives. The analysis of heroic science stories by using the framework reveals that the messages that some stories convey tend to privilege scientific knowledge over other forms of knowledge. It is therefore argued that the use of this framework can help teachers and students examine the meanings and values about science that are implicitly conveyed through science stories. Levinson (2006) has also studied teachers' and students' uses of literature and personal narratives in discussions of socio-scientific issues. The research assumption here is that learning scientific concepts and learning about socio-scientific issues are epistemologically distinct activities. Levinson then suggests that literature be used by students to gain insights into objectivity, thinking about the issue from a third person standpoint, while personal narratives can be used to generate a sense of respect and sympathy for true life experiences. In this respect, learning about science can be achieved through a more interdisciplinary curriculum that includes language, history, and social studies.

While these approaches help develop narratives and stories as interdisciplinary curricular 'tools' that serve the learning objectives concerning knowledges about science, more radical views of narratives go one step further than an instrumental perspective on narratives. The interest here lies in diversifying and reformulating visions of scientific literacy by drawing upon contested meanings of science and scientific knowledge, as supposed in marginalised subdisciplines of science studies such as cultural studies and anthropology (on this, see *Educational Philosophy and Theory*, 2006, 38, 5). The prominent idea that distinguishes these ideas from more mainstream views on science education discussed above is the assumption that the meaning of 'science' and 'scientific knowledge' is embroiled in social practice rather than a unique or separable practice that shapes a unique way of knowing.

Weinstein (2006, p.610) for example, radicalises the notion of scientific literacy by proposing the concept of scientific 'multiliteracy' that is premised upon complex material and cultural practices of science, by adopting Latour's (1987) definition of scientific literacy in terms of a literary description of scientific practice, that is "science is a question of reading, writing, and speaking". For Weinstein, learning objectives such as science-related controversial issues or traditional ecological knowledge fail to raise epistemological questions of science 'itself', by assuming that science is still a unitary practice, thus, a contestation of knowledge claims is caused by external factors, such as the nature of controversy (e.g. Oulton, Day, Dillon & Grace, 2004 in the prior discussion) or other forms of knowledge. Instead, he notes the potential of 'counter' scientific practices such as reading and writing scientific fictions – the possibilities of action and meaning

from outside professional science, as becoming “the touch point for scientific visions” (Weinstein, 2006, p.617). Then what is proposed for curriculum practice is to support teachers and students to take more diverse subject positions, not just idealised subject position of the scientists, who can ‘read’ and ‘write’ science in many different and creative ways.

In the similar vein, Gough (1999a) takes a critical stance on a constructivist approach to science education in arguing that the notion of ‘construction’ be limited in its use in understanding and scaffolding learners’ ways of building and understanding conceptual ideas of science, given that scientific knowledge itself is culturally constructed and shouldn’t be bracketed out of this notion. (Firth and Winter (2007) expresses a similar concern in the context of geography teachers’ perceptions of subject matter and knowledge). In Gough’s view, studies of learners’ misconceptions on environmental issues (e.g. Palmer, 1995) fail to question what counts as ‘environmental knowledge’ in that the educative potential of ‘unscientific’ understandings of science such as children’s imagination or fantasy are diminished. While this aligns with Weinstein’s argument on scientific multiliteracy, from Gough’s poststructuralist point of view, he further stresses the need to interrogate ways in which subjectivities of teachers and learners are conditioned within multiple discourses of environmental education, constructivism being the case of the dominant discourse which privileges rational thinking in learning processes. It is then argued that research needs to investigate ways in which current discourses of environmental issues not only mediate and shape people’s understandings, especially through the popular media, but also produce human subjectivities as actors in the world by regulating the ways in which we interact with nature.

To summarise this section, the current discourse on the role of science has been geared toward developing societal capacity in responding to uncertainty and risk issues that science and technology have brought about, in face of the demands of an ecological crisis and sustainable development. The aims of science education have also been reformulated in ways that stress learning ‘about’ science that fosters citizenship. While this approach to scientific literacy addresses the reflexivity issue in science, the epistemological issue as to whether science can be distinguishable from other social practices or ways of knowing remains debated. The mainstream discourse of scientific literacy seems to allow teachers to utilise various forms of ‘environmental knowledges’ to enhance pupils’ understanding of the nature and issues involved in science; however, the notion of science as a way of knowing - probably the most privileged one - is not likely to be dispelled in the education practice labelled as ‘science education’. This creates dilemmas for (science) teachers who wish to move away from taking the role of inducting pupils into ‘science’ by engaging in environmental education. Therefore, to investigate ways in which

teachers come to recognise and become able to challenge the meta-narratives of science that impinge on the very concept of ‘environmental knowledge’ and environmental education, is a key to identifying and further pushing or blurring the ‘boundaries’ between science and environmental education, or at the very least, examining the porosity between them. This is not only critical for science teachers but also important for other subject teachers if for them, environmental education is to go beyond a subject boundary model toward critical awareness of the epistemological assumptions that shape our understandings of science, nature, and the environment.

2.4. Proposal of research themes: teachers’ experiences of ‘environmental’ ‘education’

In this chapter then, four thematic areas that inform the research perspectives for understanding the phenomena of school environmental education have been introduced and examined: institutional development, the Korean educational context, the idea of teacher identity, and science-related curriculum knowledge. Furthermore, the review has sought to broaden the research context for this study by linking the theoretical concerns and developments from the broader fields of research in teacher education and science education to research themes concerning teachers’ personal and professional identities and their relationship with epistemological issues around what is considered to be environmental knowledge and curriculum. In so doing, it becomes clear that this study posits a research perspective that the teacher’s own constructions and perspectives of environmental education are more than what is conventionally, or formally conceived to be ‘environmental education’. The review has also addressed underlying epistemological and methodological assumptions from various research perspectives and suggested a need to inquiry into teachers’ experiences of environmental education in ways that not only matter to them but also offer grounds for critique of some of the assumptions that underpin the current state of environmental education in schools. In terms of methodology, this posits teachers’ experiences of environmental education and interpretation thereof as a key site of inquiry, and narratives and stories as data and epistemology. Chapter 3 offers an extended discussion on this, examining the theoretical underpinnings of narrative inquiry. Prior to that, three research themes and perspectives that shaped the aim of narrative inquiry are briefly addressed based on the discussions in this chapter.

First of all, the research on teachers’ thinking and practice needs to deepen an understanding of how teachers’ identities are constructed dynamically among various arrays of discourse and practice. Teachers’ life experiences as legitimate sources of educational praxis not only open up debate on the epistemologies of pedagogy and curriculum knowledge, but also enable the

examination of the possible contribution of a teacher's environment-related experiences to the constitution of teaching practice.

Secondly, teacher identity research raises methodological issues concerning how teachers' voices can be 'represented', and what is involved in the process of meaning construction, i.e. various meaning systems that are particularly relevant to or inflected in their understandings of environmental education need to be examined further. In developing a perspective about this, various options will be considered in developing multiple forms of teacher narratives, but also in terms of a research 'theme', inquiries into teachers' roles and identities in the school context will be specified given the significance of teachers' environmental education in creating cracks and ruptures in school education.

Finally, investigating teachers' science-related knowledge and understanding and pedagogical renderings of these offers more focused perspectives, or case examples, of the content areas of environment-related teaching and learning approaches. By analysing how particular teaching approaches or learning methods are considered to be good or effective by teachers, and what this involves in the interpretation process, curriculum practice can be understood as being more dynamic in relation to competing discourses of education, multiple cultural narratives and teacher experiences and stories.

These three main research themes will be explored further throughout the discussions on methodology and research design in Chapters 3 and 4, with an emphasis on how they informed the foci and the methods of analysis in the following three analysis chapters - Chapters 5, 6, and 7.

Chapter 3. Narrative inquiry: theoretical perspectives for methodological framework

❖ Chapter introduction

In the previous chapter, I developed the perspective that the phenomena of environmental education be understood in terms of teachers' personal, professional, environmental identity processes, in ways that take into account teachers' ways of thinking and knowing. This chapter discusses methodological questions associated with the ways in which 'teachers' stories' can be developed and understood to investigate the emerging research questions and themes - teachers' life experiences, professional identities, and curriculum knowledge - as set out in Chapter 2. In particular, I discuss the theoretical perspectives for the methodological framework under the umbrella term of 'narrative inquiry' by focusing on three main points:

- What is story, and what is narrative inquiry?
- What are the foci and aspects of narrative inquiry that this study is concerned with?
- What is the contribution of the proposed methodological framework to (environmental) education research?

In a review of narrative research in education, Casey (1995) argues that fundamental questions about its 'nature' must be asked: that is, "why narrative now?" Three aspects to the narrative 'problematic' are identified: existential predicaments, political commitments, and postmodern dilemmas, and these will now be illustrated in terms of researching teacher narratives about their environmental education experiences.

First, in developing autobiographical reflections on existential and phenomenological questions about the self, storytelling invites unique, authentic and expressive forms of personal meaning making of educational practice in ways that are distinguishable from other qualitative inquiry methods that are primarily concerned with generating analytic categories and concepts. Second, telling teachers' life experiences and personal meanings is also a political activity in that teacher's identity processes - personal, professional, environmental, etc.- are intrinsically an arena of struggle for challenging and redefining teachers' work to the extent that teachers' environmental education might create cracks and ruptures in school education. Third, from a postmodernist perspective on narratives, multiple texts and interpretations rather than a single narrative of teachers'

environmental education are pursued, in order to position narrative inquiry in environmental education as expanding the range of available interpretation of education realities.

3.1. Defining narrative inquiry for this study

Narrative inquiry is concerned with mobilising people's stories as a mode of knowing and as such, providing emic as well as etic understandings of lives and the world. This view of story as a mode of knowing is the underpinning epistemological assumption in this study: that is, teachers' thinking and knowledge can be accessed and understood via their stories. Studies of teachers' epistemologies and personal theories in 2.3.1 provide ample evidence on this (cf. the actual process of accessing such stories and limits will be examined in Chapter 4). Indeed, story can be seen as both 'data' and 'method' that allow researchers (and teachers) access to teachers' thoughts and actions, and their communities and cultural values (Hart, 1996, p.68). The attention directed to the genres of teachers' 'personal narratives' and 'life histories' in recent decades form the backdrop to this view, which, it is noted, have contributed to a shift in assumptions about the work of teachers, for example, from teacher as an 'instrument' to teacher as an 'agent' (Carter & Doyle, 1996), in that teaching practice and education praxis can be understood as well as challenged by a teacher's personal practical knowledge and theories. Outlining the theoretical underpinnings of the methodological framework for this study, this section will now discuss the characteristics of and tensions in the range of perspectives on narrative inquiry.

3.1.1. Narrative inquiry as a study of meaning: an overview

Narrative has received significant attention in recent times, in that it is viewed not just as a new empirical subject of research, but also as a new genre of the philosophy of science (Brockmeier & Harré, 2001, p.39). For example, Polkinghorne (1988, p.170) sees narrative knowing as providing one of the answers to the question of why something that has involved human actions happened:

It is the narrative explanation, as opposed to an explanation by law or correlation that makes narrative research different from the research ordinarily undertaken in the human sciences. ... Narrative explanations are retrospective. ... The story highlights the significance of particular decisions and events and their roles in the final outcome. (ibid)

It is in this vein that Bruner sees narrative “not simply as a form of text but as a mode of thought” (Bruner, 1997, p.64). By contrasting the logico-scientific mode of thought, Bruner posits that the narrative mode of thought is concerned with action and consciousness:

[S]tory must construct two landscapes simultaneously. One is the landscape of action, where the constituents are the arguments of action: agent, intention or goal, situation, instrument, something corresponding to a “story grammar”. The other landscape is the landscape of consciousness: what those involved in the action know, think, or feel, or do not know, think, or feel. (Bruner, 1996, p.14)

As a methodology in the social sciences, narrative inquiry broadly entails sensitivity to:

- the connections in people’s accounts of past, present and future events and states of affairs,
- people’s sense of their place within those events and states of affairs,
- the stories they generate about them, and
- the significance of context for the unfolding of events and people’s sense of their role within them (Bryman, 2004, p.412).

In other words, narrative inquiry aims to examine the storied nature of human recounting of lives and events and in so doing, its main concern lies in “the ways that people organize and forge connections between events and the sense they make of those connections that provides the raw material of narrative analysis” (Bryman, 2004, p.412). In a similar vein, Polkinghorne (1988, p.10) sees narratives as a means to capturing ‘meaning’ “through the qualitative nuances of its expression in ordinary language”, and hence narrative analysis is a useful tool in the realm of human sciences.

One of the key characteristics of narrative inquiry is that not only the ‘content’ of the stories but also their ‘form’, such as the narrative structure and styles of narration, are considered to provide further understanding of the meanings attributed to the stories. The structuralist tradition of narratology makes this distinction clearly. “*Fabular*”, often translated as “story” in English, designates the events and occurrence, and in this sense, narrative is “medium-independent”, that is to say, always “open to shaping in different media” (Rimmon-Kenan, 2006, p.13). In other words, story refers to the content of narratives: events, characters, and settings. On the other hand, “*sjuzet*” is related to narrative as a form of discourse such as expression, presentation, or narration of the story. It is about its “language-bound” quality, such as the coherence and closure of discourse (ibid., p.14). Labov and Waletzky’s (1967) well-known narrative analysis method is a prime example of the structuralist approach, focusing on an understanding of life narrative in terms of its narrative

structure that consists of the following elements: Orientation, Complication, Evaluation, Resolution and Coda. Also, plot plays a crucial part in giving a form to stories, by organising and sequencing events and experiences into a meaningful story: that is, a good plot shapes the same material into a ‘convincing’ story. Culler (1997, p.81) states:

Plot or story is the material that is presented, ordered from a certain point of view by discourse (different versions of ‘the same story’). But plot itself is already a shaping of events. A plot can make a wedding the happy ending of the story or the beginning of a story – or can make it a turn in the middle. What readers actually encounter, though, is the discourse of a text: the plot is something readers infer from the text, and the idea of elementary events out of which this plot was formed and is also an inference or construction of the reader. If we talk about events that have been shaped into a plot, it is to highlight the meaningfulness and organization of the plot.

Polkinghorne (1995, p.7) details how plots function in configuring events into a story: i) by delimiting a temporal range which marks the beginning and end of the story, ii) providing criteria for the selection of events to be included in the story, iii) temporally ordering events into an unfolding movement culminating in a conclusion, and iv) clarifying or making explicit the meaning events have as contributors to the story as a unified whole. However, this does not lead to the conclusion that life can be understood as a whole or in terms of unity. In Ricoeur’s view, the unity is that of a narrative, rather than that of a life (Verhesschen, 2003, p.455), and furthermore,

To speak of the unity of a life is by no means to imply that a life is unified by an overarching design or master project; it is, rather, to invoke the whole of a life, however fragmented and dislocated this whole may be. Nor is it to obscure the fact that a person is implicated not in one but in several stories – which, moreover, are not self-enclosed, since each may interlock with other stories belonging to one’s own life - or to the lives of others (Dunne, 1996, p.150).

In this view, ‘meaning’ is constructed not only through the materials of the story themes, e.g. various elements of the teacher’s environmental education activities, but also by the ways in which those elements are put together through the teacher’s interpretation into the plot, hence different versions of an environmental education story, e.g. a ‘breakthrough’ story or ‘hero’ story. Thus, when it comes to the question of “how did you come to be engaged in environmental education, even though it is not mandated?”, the plot of a teacher’s story is likely to revolve around a key theme of ‘motivation’ amongst other possibilities, in bringing to the fore the reasons and passions for their action as guiding the ways in which a variety of the teacher’s environment-related

experiences are organised. In this, Kenneth Burke's (1945/1969) theory of motive considers 'dramatism' as generating principles for understanding people's motives as storied by identifying the elements of story that include:

- Act – what took place, in thought or deed,
- Scene – the background of the act, the situation in which it occurred,
- Agent – what person, kind of person that performed the act,
- Agency – what means or instruments he or she used, and how they did it,
- Purpose – why he or she did it. (Burke, 1969, p.xv).

In this framework, a 'breakthrough' story or 'hero' story can be further examined as having different foci among the elements in the teacher's emplotting and interpretation of their experiences (see more in 3.3.1 on Ricoeur): that is, while both address 'agency', a 'breakthrough' story highlights 'act' whereas a 'hero' story focuses more on the 'agent'. These different versions of a story are associated with the diverse meanings that can reflect the teacher's own concerns about environmental education, hence they can be analysed in terms of variety in teacher self-understandings, i.e. 'teacher identities'. In this, while a 'breakthrough' story can be related to the question of what facilitates professional development and learning, a 'hero' story raises issues about teacher's ownership in acting upon personal motivation (cf. 'vision' story in Chapter 5). Inquiries into teachers' narratives of environmental education in this study intended to demystify such storylines premised on the idealist view of education and the role of teacher by illuminating teachers' own rhetorical constructions of their agency and competence (Chapter 6 and 7).

Having considered examples of different versions of story, narrative inquiries may be used to consider different elements, characteristics, and forms of narrative in order to provide analytic strategies by which the main themes and issues that arise from different ways of 'reading' the stories can be further examined in terms of the particular research interests and theoretical perspectives. Indeed, narrative inquiries as methodologies for social sciences and especially for education have focused on the values of people's personal or collective ways of thinking, and different 'genres' of narratives suggest different foci that the research may be concerned with (see Table 3-1).

Table 3-1 Terms/Forms and varieties of the biographical method (Denzin, 1989, pp.47-48)

Term/method	Key features	Forms/variations
1. Method	A way of knowing	Subjective/Objective
2. Life	Period of existence; lived experience	Partial/complete/edited/public /private
3. Self	Ideas, images, and thoughts of self	Self-stories, autobiographies
4. Experience	Confronting and passing through events	Problematic, routine, ritual
5. Epiphany	Moment of revelation in a life	Major, minor, relived, illuminative
6. Autobiography	Personal history of one's life	Compete, edited, topical
7. Ethnography	Written account of a culture or group	Realist, interpretive, descriptive
8. Auto-Ethnography	Account of one's life as an ethnographer	Complete, edited, partial
9. Biography	History of a life	Autobiography
10. Story	A fiction, narrative	First or third person
11. Fiction	An account, something made up, fashioned	Story (life, self)
12. History	Account of how something happened	Personal, oral, case
13. Discourse	Telling a story, talk about a text, a text	First or third person
14. Narrator	Teller of a story	First or third person
15. Narrative	A story, having a plot and existence separate	Fiction, epic, science, folklore, myth
16. Writing	Inscribing, creating a written text	Logocentric, deconstructive
17. Diff��rence	Every word carries traces of another word	Writing, speech
18. Personal History	Reconstruction of life based on interviews and conversations	Life history, life story
19. Oral History	Personal recollections of events, their causes and effects.	Work, ethnic, religious, personal, musical, etc.
20. Case History	History of an event or social process, not of a person	Single, multiple, medical, legal
21. Life History	Account of a life based on interviews and conversations	Personal, edited, topical, complete
22. Life Story	A person's story of his or her life, or a part thereof	Edited, complete, topical, fictional
23. Self Story	Story of self in relation to an event	Personal experience, fictional, true
24. Personal Experience Story	Story about personal experience	Single, multiple episode, private, or communal folklore
25. Case Study	Analysis and record of single case	Single, multiple

Generally speaking, in interview-based studies, the term narrative refers to the empirical material generated through the research process, whether oral or written, as elicited or heard during fieldwork, via, say, (semi) structured interviews or a naturally occurring conversation (Chase, 2005, p.652). However, researchers prefer different terms to specify their concerns. For example, Chase (2005) observes the interchangeable use of the term of life story and life history, while early development of life history was rooted in sociological and anthropological research. Also, the term “personal narrative” is often associated with the feature of a compelling narration, concerning for example, women’s voices in feminist research (e.g. Popular Memory Group, 1982).

The focus on ‘teachers’ stories’ as data and method in this study offers an understanding of teachers’ motivations, actions, and points of view, as opportunities to discuss their interpretations of environmental education. Owing to the research assumption that teachers’ participation in environmental education entails not only teachers facing ‘institutional barriers’ (see 2.2), but may also challenge them, a distinctive feature of this inquiry is the focus on teachers’ ‘personal narratives’ or ‘life stories’ that bring ‘beyond institutional’ contexts into the ways in which a teacher makes sense of his or her perspectives and actions regarding (environmental) education. To be clear, “life story” will be used in a generic sense to refer to the elements and characteristics of a teacher’s experiences in teachers’ personal and professional lives (as in the case of Chapter 5), while “personal narrative” will be used to stress the role of the stories in representing the teacher’s voice. Nevertheless, it is noted that Elbaz (1991) and Hart (1996) prefer the term ‘story’ to ‘narrative’ in justifying their methods, in that story is considered less linear and prescribed, and furthermore assumes a collaborative relationship between a narrator and a listener. While my position concurs with this view, in that viewing storytelling as more open-ended process and dialogue serves the research interest well in the meaning-making process (Chapter 4), the distinction between the terms will still be made when the need to stress the difference occurs, for example, ‘story’ in referring to elicited empirical materials, while ‘narrative’ in referring to structural characteristics (e.g. formative, or argumentative).

Thus, the primary interest in teachers’ stories lies in generating and discussing the meanings of teachers’ environment-related experiences in the way that the teacher’s self-understandings and interpretation of educational realities raise further issues concerning the nature of teachers’ work and responsibilities. Discussing such teacher stories can provide space for more critical views to be aired. Here, prevailing “fairy tale” (Harré, Brockmeier & Mühlhäuser, 1999) types of environmental education stories in which truth and justice are normatively assumed, for example, can be challenged by deconstructing their underpinning instrumentalist assumptions on the role of education. Also, as implied in the examples of ‘hero’ and ‘breakthrough’ stories, teacher stories of

environmental education represent ways in which teachers relate their selves to the world, e.g. by actively engaging discourse through interpellation, or being passively inducted into discourses through socialisation. Rosenwald and Ochberg (1992) argue:

The stories people tell about themselves are interesting not only for the events and characters they describe but also for something in the construction of the stories themselves. How individuals recount their histories – what they emphasize and omit, their stance as protagonists or victims, the relationship the story establishes between teller and audience – all shape what individuals can claim of their own lives. Personal stories are not merely a way of telling someone (or oneself); they are the means by which identities may be fashioned. It is this formative – and sometimes deformative – power of life stories that makes them important (Rosenwald & Ochberg, 1992, p.1).

Indeed, when asked to tell why they are engaged in environmental education, even though it is not mandated in the curriculum, teachers' accounts will be associated with some kinds of claims, arguments, and points of view that link personal environmental concern or activism, to the ascription of their professional responsibilities. Thus, teacher identities are narratively constructed in the way that teachers present who they are in view of their reflections on who they were, and their imagination about whom they want to be not only as a teacher, but also as a citizen, parent, environmentalist, and so forth.

From the overview of the main interests and characteristics of narrative inquiry in this study, teachers' stories of environmental education can be assumed to contain certain elements and characteristics and generate research issues as summarised in Table 3-2. These will be rehearsed and elaborated throughout the discussion in this chapter.

Table 3-2 Elements and characteristics of teacher’s narratives of (environmental) education

Elements to consider in narrative inquiry	Examples of narrative characteristics of teacher’s story	Examples of issues related to (environmental) education practice and research
Narrative knowing:	Personal practical knowledge, e.g. morality, sense of responsibility, value	Legitimation of teachers’ ways of knowing; Teacher as agent and knower vs. teacher as instrument and doer
Settings:	Material and symbolic conditions that provide narrative resources for sense-making; e.g. ‘scenes’	Personal, cultural, social, historical context as both enabling and constraining the productions of meaning
Events:	Temporality and places, e.g. significant experiences, turning point, memory work	Meaning making tools and processes in which some resources and opportunities are taken to trigger learning
Characters:	Teachers’ self-understandings, e.g. activist, hero, learner, parent, carer	How varied teacher identities are as opposed to an assigned set of roles; What are seen as ‘us’, or ‘others’
Style of narration:	Emotion, argumentation, reflection, coherence, fragmentation	Rhetorical strategies concerning the reasons and motivations for action
Plot:	Success, struggle, trial and error, breakthrough, happy ending	Personal versions of reality; prospects and respects of environmental education
Narrative genre:	Personal narrative, autobiography, life history, biography, etc.	The location of ‘voice’ and points of view

Therefore, narrative inquiry into teacher thinking and practice¹⁰ can be differentiated from research ‘on’ teaching in which teachers’ stories are viewed as objects (data) of research. In this sense, narrative analysis can be distinguishable from both a realist approach of which the focus is induction and ‘saturation’, and a neo-positivist approach which uses deductive reasoning and ‘grounded theory’ (Miller, 2000, pp.10-14). As such, narrative inquiry into ‘experience’ illuminates the storied nature of human experience and sense-making processes and structures. Thus, in relation to phenomenological inquiry (Van Manen, 1990), narrative inquiry seeks ‘experiential meaning’ that people attribute to lived experience from their orientation (such as identities) and interest, i.e. by questioning “what does it mean for teachers to engage in environmental education?”,

¹⁰ To be clear, there can be many different ways of categorising narrative-oriented studies – taking a broad definition. In a review of teacher thinking studies, Elbaz (1988) identifies two ‘families’ – “the personal”, and “voice” in recognising a distinction between story as a methodological device and as methodology itself (cited in Connelly & Clandinin, 1990, p.3).

in the case of this study. While ‘meaning’ is a shared interest of inquiry in both narrative and phenomenological inquiry, the former is also distinguishable from the latter in that the focus of inquiry lies in ‘textuality’ in the interpretation of lived experience rather than the ‘essences’ or ‘structures’ of lived experience (Van Manen, 1990; also see 4.2.1 and Chapter 5).

However, along with the flourishing of narrative inquiry, there has also been a critical debate on the use of personal narratives for describing and revealing the current state of educational practice from an individual’s points of view. In a review of studies that adopted personal narrative and life history, Carter and Doyle (1996, p.138) points out the tendency of biographical work to be “individualistic”. Hargreaves (1996, p.13) further alerts us to the possibility of the misrepresentation or even ‘glorification’ of certain voices and experiences through insufficiently critical investigation into the complexity of educational reality (the similar point about action research methods by Robinson & Walker, 1999), hence discursive formation of “the” teachers’ voice. Hart (1996, p.98) also addresses the challenges his research team encountered in representing the teacher’s ‘voice’ “authentically”, and stresses the view of interview as conversation as enabling to “see through” the stories themselves through continuous questioning and open-ended processes. Therefore, the narrative researcher must engage critically with the issues of representation and meaning-making processes in that elicited teachers’ stories are bound to be only one of many possible versions, emplottings, storyings and narratings.

It is in this vein that this study’s narrative inquiry was concerned with developing ways of engaging with storytelling processes, in that meanings that personal narratives generate need to be ‘located’ within a larger story or layers of other stories in which dominant cultural norms and social ideology produce frames of interpretation. In dealing with the ‘cultural politics’ of storytelling and networks of meanings, the researcher needs a “sceptical attitude” toward personal narratives, especially an awareness of “political-cultural conditions that lead to the circumscription of discourse” (Rosenwald & Ochberg, 1992, p.2). For example, the narrative inquirer should be aware that the boundaries between a ‘personal’ and ‘public’ or ‘cultural’ sphere of meaning are often blurred or contested. Concerning this, Bakhtin’s theory (1981, 1986) elaborates ideas about the multi-vocal and polysemic nature of narrative in that the meaning of a story is determined by its countless previous contexts of use. Thus, it is right to ask, “Whose is the authorial voice?” (Brockmeier & Harré, 2001, p.46). To contemplate this issue entails a critical examination of ‘voice’ or styles of storytelling that impose coherence as a way of structuring meanings that privilege a certain point of view. As Coffey (2001, p.55) observes, to investigate the complexity in meanings and their constructions requires ‘sociological’ inquiry and imagination in that it provides a strategy for exploring the relationship between structure and agency, through the “biographizing of social

structure, and structuralizing of biography” (Stanley, 1992, cited in Coffey, 2001, p.54), as strategies for investigating the relationship between structure and agency.

In fact, this concern about representation was addressed in the review of research on teacher’s professional lives and personal theories in 2.3.1 with respect to different research perspectives that illuminate the different foci and aspects of the role of narratives in exploring the interpretative realities of education. This suggests a need for theoretical assumptions and frames that can inform the ways in which specific foci and aspects of the phenomena of environmental education can be explored through narrative inquiry. In other words, discussion on narrative ‘inquiry’ is required. I approach this with the framework of a ‘narrative-discursive approach’.

3.1.2. Rationales for narrative-discursive approaches

- **Ontological and epistemological considerations**

So far the discussion has focused on the key ideas and elements of narrative inquiry. But like any other methodological approaches, narrative can be theorised and utilised from different ontological and epistemological perspectives that take on a different conception of knowledge and truth. In fact, the history of the concept of narrative is long and any definitions are still open to contestation. For example, from the standpoint of narratology, Hyvärinen (2006) and Rimmon-Kenan (2006) critique the centrality and the prevalence of narrative in the academic disciplines and the media, in the so-called “Narrative Turn” in the social sciences. Their concern focuses on the critique of the uncritical use of the concept. Meanwhile, Boje *et al.* identify a varied set of narratologies that have been sought in the field of organization studies (Boje, Alvarez & Schooling, 2002), ranging from living story, realist, formalist, pragmatist, social constructionist, poststructuralist, critical theorist, to postmodernist (see Table 3-3; but it is noted that these categories are not entirely exclusive to each other).

Using this categorisation in a review of example studies in the field, they observe different ways in which different narratologies are applied to in the way that the living story is “made into forms and structures of deconstructions and constructions by the various narratologies” (ibid., p.166). Their argument is that those ‘middle-ground’ and ‘eclectic’ perspectives with an interdisciplinary focus reflect “a move beyond the insulating disciplines” of which its inquiry is grounded in one single narratology “to more pluralistic approaches” (ibid., p.166).

Table 3-3 Metaphysics of selected alternative narratologies (summarised from Boje *et al.*, 2002)

Narratology	Ontology	Epistemology	Methodology	Major concern is to:
Living story	Stories live and possess time, place and mind.	Knowledge is the story performed in time, place and has a life of its own.	Re-story the relation between dominant narrative and authors' preferred story.	Tell embedded stories.
Realist	'Real' reality mirrored in narrative.	Real is real, narrative is subjective interpretative knowledge.	Interview with narrative as measures; biography of narrative uniqueness.	Tell true stories.
Formalist	'Real' is unknowable, but some forms are pragmatic or possess fidelity and probability.	Narrative is sign system, or rhetorical device. Contextualist epistemology of historical event unfolding in the present.	Collect and contrast forms of narrative and coherence of narrative elements.	Sort out good and bad stories by their forms.
Pragmatist	Assertion of the reality of general terms of laws.	Ideas are not mere abstractions, but they are essences.	History session by the actors. Learning from the past in view of future action.	Highlight the discrepancies between what is said and what is meant.
Social constructionist	Individual and socially constructed realities.	Narrative is subjective account reified as objective knowledge. Narratives are acts of sense-making.	Explore relative differences in narrative social construction.	Look retrospectively for sense making of stories.
Post-structuralist	There is no 'outside' to the 'inside' of the text to warrant meaning.	Narratives are intertextual to knowledge of other narratives.	Deconstructive reading of narratives.	Erase the differences between story and materiality.
Critical theorist	Historical materialism.	Dominance of grand narratives, but there can be local resistance.	Hegemonic, ideology reading of narratives.	Put story back into its material condition.
Post-modernist	Virtual and cultural hyper-real, sceptic critiques of late capitalism.	Knowledge and power are narratively fragmented.	Polyphonic and juxtaposed readings and writing of a chorus of narratives.	Shatter Grand narrative into many fragments.

To discuss my research perspectives in this study, varied narratologies will be considered and examined in characterising a multi-perspectival, narrative-discursive approach.

First of all, as suggested in the previous section, narrative inquiry as a study of ‘meaning’ presupposes an ontology that a reality is not “out there” to be discovered; rather it is constituted through sense-making process by the means of language. Given language games, narratives are not “descriptive” nor represent objective truth, as with realism, or objectivist interpretivism. We cannot know fully the truth of one’s life because, “to live is to give meaning to one’s life” (Brockmeier & Harré, 2001, p.49). Therefore, the form, genre, or discourse type of narrative is not a pre-given category, but is “constructed”, e.g. by cultural models or repertoires (Bruner, 1991). To view narratives not as an ontological entity, but as “discursive practices” that shape rules and structures of knowledge, action, and experience, supposes “fleeting reality” and “fluid material and symbolic realities of our actions, minds, and identities” (Brockmeier & Harré, 2001, p.56). But rather than proceed assuming the inevitability or necessity of a strong anti-realism, I take the fluidity of reality to set a reflexivity principle for investigating and participating in storytelling and interpretation processes (see Chapter 4) in conjunction with other narrative-discursive approaches that assume storytelling (including interviewing) is a socially situated action, and that stories are framed in and through interaction (Mishler, 1986; Riessman, 2003).

Chase (2005, p.657) conceptualises contemporary narrative inquiry under this particular view of narrative as “verbal action”, in that researchers have emphasised the narrator’s voice(s) - the versions of self, reality, and experience - rather than the factual nature of the narrator’s statements. From this perspective, Riessman (2003) explicates ways in which the analysis of personal narratives contain performative features in that identities are situated and accomplished via social interaction, which include the analyst’s questions of a narrative segment, as follows (ibid., p.337; Bamberg, 1997):

- In what kind of a story does a narrator place herself?
- How does she locate herself in relation to the audience, and vice versa?
- How does she locate characters in relation to one another and in relation to herself?
- How does she relate to herself, that is, make identity claims about who or what she is?

The proposition about narrative inquiry - narrative as discourse, as constructing social meanings - enables this study to go beyond simply ‘analytic’ approaches to teachers’ stories such as thematic and content analysis that tend to pursue generalised types and categories in teachers’ thinking such as ‘belief’, ‘conception’, or ‘knowledge’. While understanding the diversity or features inherent in the category is still a useful way of ‘describing’ how things are, it does not necessarily

conceptualise teachers' stories as 'performing' social actions within specific socio-cultural milieu. This is a gap for qualitative research in the environmental education field. I illustrate this case by revisiting Cho's study (2002) on Korean teachers' beliefs about environmental education (see p.31 for details)¹¹. In her study, the qualitative analysis of interview data was driven by preset categories of various environmental perspectives. The analysis highlights the degree of adherence by teachers to certain themes of environmental education in their actual practices, ecological sensitivity being the case in point, and this stands at odds with teachers' espoused beliefs about the need for more diverse and even radical environmentalist perspectives.

How might an alternative reading from a narrative-discourse approach be possible, if the interview texts, which probably were more open to other possibilities of interpretation at the initial stage of inquiry, were not reduced to pre-specified categories, therefore not 'idealised' (Edwards, 1997)? The narrative inquirer is likely to have an interest in 'how' it is said, rather than 'what' is said, and therefore, the narrative's structures and their relation to rhetorical features (Riessman, 2004). Reading the stories in this way, attention to narrative 'style' – for example, attention to emotion, argumentation, reflection, coherence, fragmentation (see Table 3-1), will help the researcher read 'in-between' the storyline of teachers' 'beliefs' and perhaps recognise narrative 'competence' in each individual storylines (as those of five teachers in Chapter 5). By considering the element of 'characters' – how individual teachers try to present self-images, or project certain images into teaching, it might be possible to reconnect certain storylines with teachers' self descriptions as a performance or an act of 'positioning' (Davies & Harré, 1990).

In such a way, narrative analysis can further illuminate a more dynamic relationship between teachers' beliefs and actual practices in terms of identity and role. For instance, more radical approaches might not be actualised in teaching practice, but they might still be influential in teachers' identity development by offering narrative resources for critical reflection on teaching, in the way that teacher narratives represent a futures-oriented sense of agency. For example, a narrative construction of reality might depict the belief-practice 'gap' as less unbridgeable, and allow more porosity in teacher's subjectivities as an environmental education teacher. This view of teachers' stories as sense-making of their identities concurs with social constructionism (see Table 3-3), thus, it can further allow a critical examination of how certain cultural narratives or repertoires of teachers' role impinge on teachers' sense-making including the very conception of 'belief'. In re-reading Cho's study from a narrative inquiry point of view, my intention has been to

¹¹ I decided to use her study to make this point because access to her Masters thesis enabled me to engage in alternative ways of reading the teachers' stories, as it contained a fuller account of the research process, including the interviews and interpretation than that often abridged or omitted in the form of a journal article or book chapter.

stress the need to develop sensitivity and reflexivity in the researcher's tale in ways that take into account alternative epistemological perspectives, prior to jumping to 'qualitative analysis' that may lead to a (unintended) realist research discourse.

But if narrative is seen as a form of discourse, and storytelling as discursive practice, is 'experience' also a non-entity and therefore, always bounded in textuality? If so, the experiences of teachers are in no way given an essentialised ontological status, and cannot be verified, so how can we 'value' them? And how do we know "truth(s)"? Perhaps two different approaches to teacher's knowledge can help further deliberations. Clandinin and Connelly's (2000) 'personal practical knowledge' theory is grounded in a theoretical endeavour to resolve this by drawing upon Deweyan theory of experience based on a pragmatic and relational ontology. For them, narrative inquiry is an educational research priority: "education and educational studies are a form of experience", and "narrative is the best way of representing and understanding experience" (Clandinin & Connelly, 2000, p.18).

Whereas this take on the value of experience still focuses largely on the individuals' own experiences and their living situations, a more critical theory-oriented inquiry should concern macro-social influences on those experiences (see also 2.3.1). Britzman (1991/2003, p.33), from a critical ethnographic perspective, argues that studying "lived-experience" needs a turn to critical inquiry in that the context of such lived experience is not neutral, that is, "the structure of teaching" is not innocent of ideology and dominant discourse. It is this structure of experience, she further observes, that results in the pervasiveness of "fragmented experience" in teacher education and the realities of education such that the capacity to extend or transform meaningful and reflective experience is obstructed (ibid., p.51). In a similar vein, Polkinghorne (1995, p.16), with Dollard (1935), calls for attention to the influences of "cultural context" on the narratives that provide particular meanings to happenings and actions, that maintain assumptions about acceptable and expected personal goals, and that sustain normal strategies for achieving such goals.

It can be argued that Clandinin and Connelly (2000) and Britzman (1991) seek different ways and foci of telling truths but not in an exclusive way. In fact, both approaches refute naïve realism and put great emphasis on the hermeneutics of meaning-making in constructing representations of teachers' lived experiences through the narratives in which teachers make sense of the world. In subscribing to the view that "understanding is participative, conversational, and dialogic", and meaning is not had but negotiated or constructed (Schwandt, 2000, pp.194-195), my interest in interpretation lies in the reflexive and constitutive processes of meaning-construction throughout

the research in engaging the discursive production of teachers' stories¹², rather than in setting a pre-specified objective informed by particular theoretical frames that enable a production of conceptual categories to analyse data. It is an epistemological point shared by both philosophical hermeneutics and constructionism (Schwandt, 2000). Where the similarity ends is the degrees of trust in the potential of language to "disclose meaning and truth" (ibid., p.198), as illustrated in the different foci of inquiry in Clandinin and Connelly's and Britzman's work.

My view is that the material conditions and ideologies that are a primary concern of critical theory should also be regarded as emerging from and shaping 'settings' in teachers' stories, such that theoretically informed frames (including particular educational discourses) can be considered in questioning which stories remain untold or need to be told, rather than taken as totalising concepts of discursive processes which individual experiences have no escape from. Simply put, as Riessman (2003, p.333) notes, narrative analysis is about "open[ing] up forms of telling about experience, not simply the content to which language refers" by asking "Why was the story told that way?" Furthermore, it is noted that putting boundaries around a story's contents and narrative elements from elicited stories is an "interpretive act" that is shaped by the researcher's interest and theoretical frames (Riessman, 2003, p.335), as much as it is predicated on an immediate interpretation through the grasp of major patterns and universality of meanings in the stories *per se*.

▪ Interpretative strategies

This epistemological interest requires the study's narrative-discursive approach be centred on awareness on plurivocality: the potential for multiple interpretations of stories, voices and realities. In fact, the inquiry process sought to develop and generate teacher stories that not only tell something about personal meanings (Chapter 5) in ways that give more trust in the generation of meanings, but also push the boundary of discursive categorisations such as those of teacher roles (Chapter 6), and suggest that a more sceptical attitude toward language - especially the effects of discourses, is required. In this way, the narrative-discursive approach came to feature a 'gradation' in narrative representations, in the ways that different degrees of narrative 'authority' are given to personal narratives depending on where the stories are embedded, and what mechanisms of sense-making are operating in particular stories. In further explicating this idea in theoretical terms, the

¹² In this sense, narrative inquiry that is concerned with people's 'sense-making' processes can be distinct from other interpretivist-based qualitative inquiries in that sense-making is more about the activities and processes in which people engage, whereas interpretation denotes more about the outcomes produced from such activities and processes (Weick, 1995, pp.12-13).

metaphor of 'place' and 'location' as key characteristics of narrative 'inquiry' resonate well with the study's design:

[p]lace or sequence of places draws attention to the centrality of place, that is, to the specific concrete, physical, and topological boundaries of place where the inquiry and events take place. This commonplace recognizes that all events occur in some place. It draws attention to borderland tensions because those who work from post-positivist, post-structuralist, or Marxist positions may wish to escape the limitations of place in the interests of generalizability. For narrative inquirers, the specificity of location is important. The qualities of place and the impact of places on lived and told experiences are crucial. (Clandinin & Rosiek, 2007, p.70)

In other words, the narrative inquiry into teachers' stories in this study concerns itself with exploring the meanings of particular stories teachers tell in relation to their environment-related experiences, with a focus on two particular axes of 'location' in which the stories are told, and therefore, the meanings are constructed. The first axis is concerned with the 'layers' in the stories of particular themes. To rehearse three research themes - teachers' life experiences, teachers' professional identity, and teachers' curriculum knowledge - teachers' own stories of all three aspects need to be located within a larger story or other layers of stories. I call this strategy a 'beyond personal narratives' approach that enables situated meanings of the teacher's interpretations of his or her, or collectively 'their' environmental education experiences, by means of juxtaposition, commentary, or further narrative analysis by using the stories that 'surround' teacher's stories: the researcher's story, other people's readings of teachers' stories, media stories and other educational narratives (see 4.4.2). In composing and reading these multiple stories, intertextuality - the concept originated in literary theory, "denot[ing] ways in which works of art - especially of literature - are produced in response not to social reality but to previous works of art and the codes of other conventions governing them" (Sebeok, 1985, p.657) is considered as an interpretive tool with which to inquire into the meanings acquired from a story's surrounding cultural/linguistic conditions that are largely institutionalised, and therefore, "through which the familiar world is continuously interpreted and reproduced" (Shapiro, 1989, p.11). This coincides with Ricoeur's view on life and narrative, in that a person is implicated in several stories in ways that interlock with other stories beyond one's own life (see the quote at p.71).

Crucially to the study's interest, this perspective gives justification to the inquiries into the value of teacher narratives as 'small' stories that represent teachers' creating cracks and ruptures in school education through their environmental education.

The second axis is concerned with the question of where the story is embedded and where the meanings are possibly and plausibly located. In this, a teacher's recounting of 'environment-related experiences' can be seen as related to specific social practices through which particular concerns, values, or points of view related to the environment, education, and environmental education are constructed as meaningful or valuable to teachers. The idea of 'social practice' as proposed by Macnaghten and Urry (1998) offers an analytic tool for investigating the relationship between environmental change and human engagement; as they state:

[I]t is specific social practices, especially of people's dwellings which produce, reproduce and transform different natures and different values. ... It is through such practices that people respond, cognitively, aesthetically and hermeneutically, to what have been constructed as the signs and characteristics of nature. (ibid., p.2)

Such social practices are constituted variously by principles that are characterised as 'discursively ordered', 'embodied', 'spaced', 'timed', and involve 'particular models of human activity, risk, agency and trust' (ibid.). Specific constitutive principles can be considered to operate in a teacher's experiencing of the world; hence, particular categories and qualities of experiences are told in the way that a teacher's 'environmental education stories' are composed of specific narrative elements and characteristics. This study seeks to identify and examine how particular themes of stories: 'life experience', 'professional identity' and 'environmental curriculum' are related to specific meaning-making systems and processes: 'personal', 'institutional', and 'cultural' space, respectively (see 4.4.1).

But how can the researcher draw the boundaries of relevant 'context'? And how much information does the researcher need to analyse any particular texts/context? Regarding these questions, the debate between conversation analysts and critical discourse analysts can help elucidate the relationship between text and context in narrative analysis. For conversational analysts, the principle of the relevance of context is decided upon in the participants' talk and how conversational reality shapes the immediate features of context. Schegloff (1992) distinguishes this 'proximate context' from 'distal context', which he sees as irrelevant in discourse analysis. By contrast, Foucauldians, post-structuralists, and critical discourse analysts define the discursive broadly by situating the conversation in social, historical, political, and cultural contexts, in asking how particular contexts create certain modes of representation (Wetherell, 2001, pp.388-390). With these competing theories of text/context relationship in mind then, the research needs to clarify research questions and the definition of 'data' to set the relevant context for one's own research project, hence the need for reflexive engagement with inquiry process as in Chapter 4 (Taylor, 2001).

The research focus in this study is to illuminate teachers' points of view in understanding the phenomena of environmental education in the way that individual teachers' unique experiences and ways of thinking can be valued. As such, this denotes a stress on teachers' stories as the main source of data rather than any other discursive sources or texts that shape meanings of environmental education (e.g. international declarations or national policy or curriculum initiatives in 2.1). But the latter still remain significant in that they may operate as discursive framings in constituting what counts as environmental education, or what it means to be an environmental education teacher, e.g. in the 'institutional context'. It is also noted that such narratives and discourses might not be addressed or recognised in teachers' storytelling processes, in that teachers' motivation for and participation in environmental education is more like to be associated with a 'personal context' of environmental learning. Thus it might appear that a teacher's stories about his or her environment-related activities have no close relationship with the discourses of environmental education.

But the disconnection in teacher's own recognition neither entails nor is presupposed by the disconnection in discursivity. Rather, we can ask, "What aspects of a particular discourse do impinge on teacher's experiencing specific action and practice as environmental education?" Also, given the diversity in teacher's personal experience itself, relevant 'context' could include cultural, social, and historical narratives that afford teachers with learning opportunities as well as models for action such as environmentalism in Korea. With this tentative perspective of text/context then, Chapter 4 further clarifies the ways in which the interview and inquiry processes inform the development of analytic strategies in ways that attend to personal/institutional/cultural discursive dynamics in relation to emerging research issues and theoretical interest.

To clarify the narrative-discursive approach in this study based on the discussion so far, the analysis aims to provide intersubjectively and intertextually created teacher narratives in double forms for each story theme (as identified in Chapter 2 and further informed by empirical inquiry): firstly, teachers' personal narratives are the primary source of data in that the research aims to explore the ways in which the multiplicity of meanings designated to 'environmental education' can open up sites for the construction of more diverse and progressive ways of creating stories about environmental education and education in general. Secondly, as a "bridging analysis" that can illuminate the discursive dynamics of stories and discourses (e.g. Court, 2004), other sources of data will be used complementarily. As such, the accent in the analysis is on 'narrative' rather than 'discourse'.

3.1.3. Perspectives from environmental education research

Having addressed the assumptions on ‘inquiry’ in this study that storytelling is a discursive practice in which identities are situated, interpellated and performed, I now consider some of the key approaches in the environmental education research field that offer insights into ways that also recognise research issues regarding teachers’ thinking and practice. I engage with discussions on how research can account for meaning-making processes and systems that constitute meanings in this field, focusing on key aspects for developing my own strategy for a narrative-discourse approach. I have found ideas developed by two environmental education research scholars particularly helpful. Work by Hart and by Payne lends support to my ontological, epistemological, and methodological claims concerning the researching of the phenomena of environmental education from teachers’ perspectives, in the sense that both researchers have sought to develop their own theories of research inquiry as well as inform ways of developing empirical research methods. Hart’s ideas are more useful in thinking about the potential and limits of narrative inquiry, while Payne’s are more concerned with the ontological entry point of the research.

Hart’s (e.g. 1996, 2003, 2008a, 2008b) work has developed a range of narrative inquiry approaches for studies of teachers’ thinking and practice in environmental education. His views on the nature of environmental education concur with my interest in this study, to research how the phenomena of environmental education may create cracks and ruptures in school education:

In a field such as environmental education which espouses a worldview in which humans are encouraged to actively participate in and to challenge contemporary social and environmental policies and practices, as well as the taken-for-granted assumptions of the dominant worldview, should not the research process encourage participants to challenge traditional methods? In other words, given the socially critical character of environmental education, how can environmental education research not be qualitative, participatory, and critical? Almost by definition environmental education research must include provision for teachers to learn how to actively inquire into their own practices and to clarify their thinking as a means of extending and developing their own actions, and to actively participate in the social and political reconstructions required to address intelligently educational as well as social/environmental issues within complex, evolving social situations (Hart, 1996, p.61).

His epistemological and methodological concerns in this work have focused on how research can represent teachers’ knowledge(s) and voice(s) through conversation in a participatory and collaborative way (this is elaborated in Chapter 4). Developed in this way (e.g. Hart, 1996),

teachers' stories are presented in different narrative forms: for example, individual teachers' short stories followed by the researcher's accounts of the relevant context that illustrate the commonalities and idiosyncrasies amongst teachers' thinking and practice, and the themes of teacher accounts of personal environmental philosophy in juxtaposition with relevant literature and theoretical perspectives (Hart, 2003). In so doing, not only are teachers' stories offered to the reader to interpret, but also teachers' ways of knowing - especially in terms of moral responsibility and sense of care - are shown to be a legitimate form of knowledge for understanding educational realities, through telling their stories of lived experiences.

Presenting teacher narratives in such ways, Hart intends that how teachers' stories matter in and to teacher thinking can be understood by readers as they begin to see aspects of the deeply embedded philosophies and the critical consciousness underlying 'change' (Hart, 2003, p.98). In terms of theories of environmental education, his narrative inquiries into teachers' thinking and practices illustrates a theoretical and methodological framework to understand the complexities in teachers' motivation and participation in environmental education through their own voices or series of "little stories", in that such narrative understandings may offer critical insights into rethinking and challenging more prevailing, official narratives about why teachers should take responsibilities of engaging in environmental education. (This focus on the 'personal' meaning of environmental education was one of the main themes in this study, and has been developed into the five individual teacher's life stories in Chapter 5, but with a unique focus on the 'plot' of stories. While in developing a more analytic lens that is beyond Hart's concerns, more literature on narrative identity will be reviewed in 3.3.1.)

More recently, Hart's approaches to narrative inquiry have moved away from a focus on authentic representation of teacher stories toward critically examining the discursive dimension of meaning construction such as through social learning (Hart, 2008a):

We attempted to go beyond claims about teachers' stories as mere windows into teacher's thinking or representing their essences, to a view of their thoughts and actions as discursive constructs that are collectively shaped. (p.202)

Whether nature or sense of place itself fosters awareness, and perhaps, appreciation, the key move in our inquiry was to begin to see teachers' practices in terms of their identities rather than treat their stories as windows to another entity that stays unchanged. If we could trace actual images of ideas that seem to cross people boundaries, we might want to disrupt some conventional notions of learning as a process of human cognition, and invite discussion

about alternative conceptions – constructive, situative, and culturally critical. (p.208)

In extending previously autographical work through a genealogical approach, the epistemological and methodological tensions and dilemmas have also had to be addressed in detail (Hart, 2008b). A prominent dilemma in epistemology concerns the adequacy of teacher narratives in enabling critical examination of the constitutive quality of systems of discourse, for example, how individuals were/are formed as subjects within local and historical contexts. To develop inquiries into the ways of ‘tracing’ environmental education sensibilities as constituted within local geographical contextual practices, methodological issues need to be elucidated too. Thus Hart (2008b) examines the potentials and constraints of genealogical inquiry to compensate autobiography and life history methods. For him, genealogy helps the (re)searching of teachers’ small stories in terms of the ways that they are shaped as “a series of irregular movements along multiple paths between the past and present for possibilities/emergences of particular discourse-practices” where teachers’ knowledge, agency, and power relations cross (ibid., p.230). While genealogy also recognises the manners of identity production and development by providing multiple stories, and therefore, enables a disruption of certainty in the interpretation, it is also noted that this open-ended, indeterminate process of inquiry and interpretation demands the researcher’s self-consciousness and reflexivity in textual representation, so as to achieve “plausible fictions” in the analysis (ibid., p.232). Therefore, the question for narrative researcher is how to judge their knowledge claims within the uncertainty that the focus on self, identity, and agency in their inquiry entails.

In my research process, I also experienced such dilemmas as I sought to develop analytic foci on teacher’s stories multi-dimensionally: life experience, professional identity, and curriculum (see 3.3). While my main strategy in the interview process was concerned with eliciting and sharing teachers’ life stories in ways that in epistemological terms, are concerned greatly with narrative knowing, that is, the teacher’s embodied knowledge, other research processes have found the legitimatisation of teachers’ stories could be better achieved through more critical stance on the stories themselves. Thus, although my analytic strategy was to match epistemological and methodological underpinnings with their affinities with research themes and narrative forms, a critical examination in the limits and alternatives of such a design is also required.

In this study, my goal has been to be able to theorise the ontology of teacher experience too. As already discussed in 3.1.2, my claim was that pragmatism and scepticism (e.g. Clandinin and Connelly, 2000 and Britzman (1991), respectively) can co-exist within the research given the extent to which the multiple layers of reality that constitute meanings and govern signifying

processes are revealed and contextualised through the notion of the ‘place’ and ‘location’ of stories. Here, Payne’s (see Payne, 1997, 2000, 2003, 2005) ideas on social ontology and post-phenomenology can help theorise the problematic relationship between lived experience and interpretation - particularly the teacher’s ‘environmental experience’.

For Payne, although we are not always able to know the essences and structurations of embodied experience given they are often “pre-reflective” and lie “below consciousness”, we can still “excavate” them when they “perform work on human *being* and *doing*” (Payne, 2003, pp.173-174, original italics). Thus he highlights the idea of ‘form of experience’, that is, embodied and re-embodied experience through the relational nature of the body and the environment as a useful tool in “portraying how the activity basis of experience can be examined to see how it constructs human and environmental relations” (ibid., p.180). By examining different forms of experience such as outdoor activities or critically narrating such form of environmental experience, Payne argues that phenomenological and ontological inquiry can support both deconstruction and reconstruction of meanings of environmental experience and environmental education. And it is noted that there are also different levels of subjective (un)knowing about such layered experiences, and different methods, for example, memory-work, in-depth interviewing and saturated observation, that may generate or permit access to such knowledge (Payne, 2005, p. 428).

For narrative inquirers, ontological deliberations such as these enable the inquirer to “sit” on a continuum between objectivity and subjectivity, concurrently examining their own perspectives and dispositions regarding the value of the participant’s subjectivity (ibid., p.186). Although the research themes in this study do not focus on a phenomenological inquiry into teachers’ environmental experiences themselves, the perspective is helpful in examining what aspects of teachers’ experiences in personal and professional lives are selected and brought to the fore as ‘significant life experiences’ in teachers’ narratives, in the ways that narrating such stories reflects not only personally significant situations and contexts but also in conjunction with cultural frames, concerns that which is currently popularised as environment- and pedagogy-related concerns and issues. Thus, investigating categories and qualities of experience and ways of narrating the experiences should be the part of the inquiry process that is to sensitise the ways in which particular ‘experiences’, ‘environments’, or ‘issues’ are categorised as environmental education activities or a teacher’s concerns and knowledge basis in environmental education. Such an inquiry requires a phenomenological perspective to be embedded within the fieldwork experience, so that the significance of ‘place’ and ‘location’ of storytelling and stories as discussed in the previous section takes the researcher not into endless loops of textual practice but, as with Hart, helps “get at the

culturally sedimented and socially constructed layers of situated human experience” (Payne, 2005, p.428).

Looking ahead, perspectives from the environmental education research field posit narrative inquiry to be more sensitive with issues related to (both participants’ and researchers’) subjectivities and the interpretation process as a meaningful inquiry process in which teachers’ stories are generated in a more reflexive and multidimensional form. Engaging with these locates the nature of this research within the ‘post-post’ (or ‘post-critical’) discourse in which issues of representation, legitimation and the politics of theories are no longer taken for granted as in the case of positivist- and post-positivist-informed inquiries, but rather take these into account so that they become the core of a reflexive process of inquiry (*Environmental Education Research*, 2005, vol. 11 (4)). In short, both Hart and Payne suggest that narrative researchers must search for ways in which a kind of situated knowledge is possible and available to researchers (readers and participants), e.g. through a ‘critical literacy’ that directs their methodology toward questions of research ethics and responsibility (e.g. Hart, 2005, p.399).

3.2. The role of narrative inquiry in education

With this general framework for a narrative-discursive approach to teachers’ narratives in mind, the role of narrative inquiry will now be examined through a review of narrative genres in education and of the contribution of environmental education research to education.

3.2.1. The review of narrative genres

As in Table 3-2, the distinction among genres and research methods is often arbitrary rather than strictly made in conjunction with literary theories. Given the methodological framework (narrative-discursive approach to stories as discussed so far), I focus on two narrative forms: personal narrative and collaborative storytelling, which both locate the ‘personal’ within a socio-political milieu.

▪ **Personal narratives: identity work and narrative strategies**

Educational researchers address through narrative and discourse approaches how individuals (e.g. teachers and learners) develop and maintain their ‘identity strategies’, as a student or a teacher in coping and living with points of consensus and conflict in educational practice. This strand of study, often informed by critical or postmodern perspectives, aims at revealing and challenging power relations by identifying how dominant discourses and ideologies impinge on an individual’s identity construction, by using personal narratives as a window into the discursive practices and structuring of education.

One of the theoretical roots for this approach to personal narratives can be traced back to symbolic interactionist approaches in the sociology of education. For example, Woods (1977) proposed an interactionist model of teaching for the analysis of teacher behaviour that views teachers as more autonomous than was assumed in a functionalist view of system-actor relationships. In this model, teacher behaviours, such as ‘accommodation’, could be examined as micro processes in which the teacher makes sense of the self-concept when dealing with institutional situations, and therefore, more strategic thinking and action occur (ibid.).

The concept of ‘identity work’ has been used to ‘link’ such individual-structure relationships in sociological inquiry, through examinations into the “activities individuals engage in to create, present, and sustain personal identities that are congruent with and supportive of the self-concept” (Snow & Anderson, 1987, p.1348). Identity then, is not just given to, nor had by people; rather, in this view, people “do” identities in the way that they generate self-identities in favour of self-worth and dignity, in maintaining a coherency in their narratives when meeting challenges (Woods & Jeffrey, 2002), often against an ‘assigned social identity’ (Ball, 1972). This focus on identity processes, i.e. how teachers form identities within changing scenes in educational and cultural restructuring processes, can reveal the routes for and substance of social interactions from an individual’s point of view, and the hermeneutic processes of meaning making they engage in. Analysis of personal narratives as providing analytic tools for examining ‘micro’ identity processes illuminate personal meanings and subjectivities which can then be further pursued to critically examine more dominant discourses and narratives. The review of empirical studies further provides an understanding of the ways in which personal narratives can inform the research perspectives¹³.

¹³ The choice of the studies for review was made with respect to the explicit use of the theoretical concepts such as ‘identity work’ and ‘narrative strategies’ as guiding the ways in which personal narratives are placed within individual-structure relationship.

Woods and Jeffrey (2002) have examined teacher identity construction by taking the newly adopted 'school inspection policy' in England as a fertile site for inquiry, in that arguably it produces significant changes in the notion of teachers' work and responsibilities. Their focus of analysis was on the ways in which English primary teachers 'reconstruct' their personal identities in response to the reconstruction of the schooling system, through teachers' narratives of self-concept and their dilemmas. In the context of changes in teachers' roles from previously humanist, vocationalism-based, child-centred values to newly assigned 'teacher competencies' such as subject expertise and management, teachers' narratives reveal that their identity strategies had become more strategic and political in the way that they reflected conflicts and tensions as teachers tried to preserve a sense of holism in self-understanding, while still having to manage how to negotiate and deal with a newly assigned identity. According to Ball (1998), these volatile and fragmented characteristics in teachers' self-understandings can represent, even foment, an identity crisis in the face of narrowly defined social identities. Ball argues this is typical of a situation characterised by "performativity", in that an individual teacher's performances become the criteria for judging the quality of their work, and are therefore the new grounds (however unstable they might be owing to ongoing curriculum reform) on which professional subjectivities are to be regulated and controlled.

Indeed, for Woods and Jeffrey, the analysis of teachers' personal narratives has to be closely related to a critical examination of the policy narratives that have begun to dominate the languages and frames through which teachers are 'forced' to make sense of the definitions and significances of their roles in schools, in the British context. Other related studies that investigated the matter of the crisis in 'trust' (e.g. Troman, 2000) support that an analysis of teacher's personal narratives can contribute to further social critique. Firth and Winter (2007) address a similar concern in terms of the Initial Teacher Training (ITT) policy in England and student teachers' educational for sustainable development (ESD) teaching. Observing that in spite of their awareness, student teachers' teaching did not well reflect the constructivist approach to pupils' learning that have been introduced into ITT and that parallels ideals ascribed to ESD, they point out that the standardised curriculum in ITT, in stressing teacher accountability, impinges on the students teachers' thinking about ESD teaching in terms of curriculum 'delivery', by which opportunities for introducing the mediated nature of knowledge are missed out. The study suggests that critiques of ITT policy narratives that actually limit student teachers' thinking about their pedagogical role remain imperative.

Chase (1995) examined American women school superintendents' narratives of their professional experiences within an analytical frame of power and subjection. The study investigates personal

narratives by using a concept of ‘narrative strategy’ with which to capture the narrator’s specific orientations and approaches to discursive realms, and that provide languages and frames of what it means to be a successful professional (ibid., p.xii). Specifically, these women’s narratives and storytelling processes illuminated two cultural discourses as shaping their self-understandings as a successful professional: ‘individual achievement’ and ‘inequality’. But it was the ‘discursive disjuncture’ between the two discourses that the researcher sought to highlight, in light of taken-for-granted gender- and race-neutral discourses about professional work; hence, when professional success is seen to be down to an individual’s achievement this is in fact in tension with contentious, gendered and racialised discourse about inequality (ibid., p.xi). Such a discursive disjunction not only shapes the ways in which women can make sense of their professional experiences, but also becomes contested by the individual woman’s ‘narrative strategy’: the way she wrestles with the disjunction in terms of power and subjection (ibid., p.xii).

Chase uses four women’s narratives to represent different patterns in narrative strategy through which they either ‘reinforce’ or ‘undermine’ the disjunction. Their commonality is also identified as ‘a larger story’: “individual solutions to the collective problems of inequality” (ibid., p.xiii). Through this analysis, Chase argues, this story is a ‘better’ story than a ‘co-optation story’ in the sense that here, women are at least recognised, rather than ignored, and thus consequently acquiesced to the structural conditions that maintain inequality in their profession. But to imagine and realise a more politicised vision, Chase offers a more collective recounting of ‘activist’ stories, in order to awaken women to their own narrative strategies, and to identify how their stories preserve gender-neutral, individualistic discourse in their profession. Indeed, Chase’s reflection on the research process notes that neither researchers nor interviewees recognised this discursive feature during the interviews and which thus shaped the limited language of their storytelling, i.e. in this case, broaching the discursive disjunction during the interviews themselves. Thus Chase argues the need to push ourselves toward “fuller consciousness” of our situation to tell a “better story” (ibid., p.186): opening up opportunities for an individual’s storytelling to go beyond simply offering a personal understanding of the world:

Individuals and communities may become aware of the political-cultural conditions that have led to the circumscription of discourse. If a critique of these conditions occurs widely, it may alter not only how individuals construe their own identities but also how they talk to one another and indirectly the social order itself. Discourse mediates between the fate of the individual and the larger order of things. (Rosenwald & Ochberg, 1992, p.2, cited in Casey, 1995, p.186)

To summarise, these studies represent different ways in which an individual's narratives can inform research inquiries: while Woods and Jeffrey focus on the 'gaps' between teacher's self-understandings and social identity as impinged upon by a policy discourse, Chase has been more concerned with a 'change' of prevailing narratives toward those that give voice and space to a more radical feminist vision. The common ground for these distinct interests is their use of identity work and narrative strategy as analytic concepts. Indeed, the studies share a concern with the relationship between an individual's subjectivities and the larger story or discourses that both enable and constrain personal options for identification (or dis-identification), interpellation and refusal, and the importance of identifying specific discursive moments characterised as performativity or discursive disjuncture, respectively in these two cases of the shaping of particularities in subjectivity. And these particularities raise further issues about how theories of individual's identity construction process can be detailed in ways that capture diversity and dynamics of the process.

This recognition on a more flexible individual-structure relationship might help further theorising teacher identity in environmental education. For example, Barrett's (2006; also discussion at p.33) post-structuralist analysis of a 'passionate' environmental educator's narratives examines how dominant educational discourses work to saturate and constrain the teacher's capacity to help pupils take action for the environment. Specifically, when the teacher was concerned about becoming a social engineer, which is contrary to the 'proper' teacher role in the conventional school education, taking up alternative discourses meant possible risks and difficult negotiation. Throughout this analysis, what is required is to interrogate discourses, concerning how we have come to know what we know that produce self-understandings, namely, how story mediates experience. Barrett's perspective of discursive production of teacher identity seems to parallel Chase's claim for the need to push us toward fuller consciousness of discursive junctions to tell better stories.

But perhaps narrating one's experiences involves multiple, overlapping, conflicting elements and patterns in subjectivity-discourse relationships that may shun any easy theorising of action, agency, or resistance leading to experiencing and storying differently. While the narrative analysis in Barrett's (2006) study focused on the parallel relationship between educational discourses and teacher subjectivities, other analytic foci might be also possible in ways that go beyond reading stories within the limit of theoretically-set categories of discourse and subjectivity (e.g. Barrett, 2008). In other words, perhaps there is a need to examine the features of the dynamics in identity construction itself, rather than the categories of discourses and subjectivities as a tool for analysis (see Chapter 6). For example, we can ask what are the prominent features of 'characters' and

‘plots’ or teacher’s rhetorics (see Table 3-2) that make the same narrative resources (teacher’s passion, belief, frustration in action, etc.) open to other meanings in teacher’s environmental education identity than the neutral/engineer frame?

In conclusion, such studies with a focus on an individual’s narratives of identity struggles and processes illuminate the degrees of possibility and flexibility available to the interpretations of storytelling as a process through which individuals constitute realities. But they also suggest that research needs to be alert to the systems of meaning and discursive practice in which meanings and subjectivities are produced, within (and against and beyond?) historical, material, and structural conditions, and through the theorising process itself, and hence, remain open to contestation and diversification.

- **Collaborative storytelling and professional development**

As Chase’s (1995) recommends, the priority that can be given to producing a more collective version of a story can enable ‘changes’ in languages by leading to individuals’ sharing of their own stories and a critical awareness of the constraints and possibilities in their stories, through setting them alongside those of others. In this sense, collaborative storytelling can lead to professional development among groups addressing similar concerns and interests. I now focus on two different genres that concern themselves with such collaborative storytelling: autobiographical inquiry and life history.

Concerning teachers’ professional development, Butt and his colleagues have aimed to develop autobiography as a catalyst for creating collective forms of teacher knowledge and development (Butt, Townsend, & Raymond, 1990; Butt and Raymond, 1989; Butt, Raymond, McCue & Yamagishi, 1992). Their unique approach to autobiography is concerned with giving teachers an opportunity to “evolve” their life stories by sharing them with other teachers so that they can gain a collective sense of teaching through clearer and deeper understanding of the contexts in which their teaching is situated (Butt, Townsend & Raymond, 1990, p.257). Having carried out this work, a review of more than 100 teachers’ collaborative autobiographies enabled them to identify three major categories of the experiences that influence teacher development: teacher’s private life history, professional experiences, and the teacher’s own experiences as a student in school. Across these themes and stories, “the collaborative context” such as interactions with peer groups, mentor relationships, and working for a collaborative project, is understood as the key to successful

professional development, and, therefore, might be further used to inform ways of constructing a more collegial school culture (ibid., p.262).

Within this line of autobiographical inquiry, “*Learning From Our Lives*” (Neumann & Peterson, 1997) is a collaborative autobiography of women scholars in the educational field concerning the place, meaning, and experience of research in their lives. Informed by feminist ways of knowing, the writers of the project were encouraged to ‘reverse’ the conventional writing practice underpinned by the dualistic view of personal and professional, so as to re-write their research history as a personal experience. The reflexively written texts then revealed the origins of research that are often largely predefined by others through the institutionalised practices of knowledge formation in the field of education in ways that are blind to women’s ways of knowing. The authors’ writing also unfolds a journey of a search for alternative realities through resistance and re-envisioning. Furthermore, readers are invited into reflective thinking through contemplating their own personal images that may be “inscribed” in their own research (ibid., p.10). In this way, autobiography is believed to help both authors and readers see and appreciate institutions and organisations that frame our lives.

While this autobiographical inquiry focuses on the author’s own reflection and collective action among the authors, life history promises a move toward more active collaboration between researchers and teacher participants. A prominent figure in this approach, Ivor Goodson, proposes a political project of education through research:

It is not sufficient to say we wanted “to listen to people”, “to capture their voices”, “to let them tell their stories”. A far more active collaboration is required. [...] At the centre of any move to aid people, teachers in particular, to re-appropriate their individual lived experiences as stories is the need for active collaboration. (Goodson, 1995, p.95)

The rationale for a need to move away from life story - a personal reconstruction of experience, toward life history - a broad inter-textual and inter-contextual mode of analysis (Goodson, 1992), is also understood by his critique of media discourse. He observed the increasing reception of a personal narrative genre in the media in America and increasingly in Britain, but his concern was that it fortifies the classic story line of an American version of the good life, including appealing to personal and family values. And it is argued that the sponsoring of personal, marginalised voices, which was supposed to be the project of storytelling genre, in fact, has rather “closed off” political and cultural analysis by only reinforcing middle-class lifestyles and values (Goodson, 1995, p.91). Hence, his proposal for critical inquiries is that collecting stories must be seen as the starting point

for collaboration, not as automatically assuring linkages to cultural and political analysis (ibid., p.98).

Goodson's life history method as a way of 'representing teachers' then is to locate teacher's personal stories within socio-cultural spheres, that is, "a story of action within a story of context" (Goodson, 1997, p.115). This 'duality' structure of story is informed by Giddens (1991) in understanding self-identity as a reflexive project under the influences of late-modernity:

The global forces which are undermining traditional forms of life and work are likewise transforming notions of identity and self. Identity is no longer an ascribed status or place in an established order; rather, identity is an ongoing project, most commonly an ongoing narrative project. In the new order, we "story the self" as a means of making sense of new conditions of working and being. The self becomes a reflexive project, an ongoing narrative project. To capture this emergent process requires a modality close to social history, social geography, and social theory - modes which capture the self in time and space, a social cartography of the self (Goodson, 1998, p.4).

In this view of identity as process or project, a teacher's personal and practical stories are bound to be selective, singular, and specific; therefore without locating them within the larger context through the use of other sources of story, limits our capacity to understand social and political contexts and patterns that go through changes (ibid., p.6).

To conclude this section, the idea of 'sharing' personal narratives or telling 'collective narratives' is helpful in considering the layers of stories of environmental education that are not necessarily recognised in an individual teacher's accounts. Although this study does not aim to develop a specific genre of such a collaborative version of stories¹⁴, how the ideas of other stories, layers of stories, or larger stories can inform the ways in which personal narratives gain more situated meanings, will be further considered in Chapter 4.

¹⁴ 'Teacher education as narrative inquiry' (Clandinin, Davies, Hogan & Kennard, 1993) can be a specific genre of collaborative autobiography that further develops narrative inquiry to facilitate teachers' professional development. But the focus of inquiry in this study lies in the narrative analysis of teachers' environmental education rather than the use of narratives as a pedagogic tool.

3.2.2. A genre of environmental education? Search for multiple spaces for narrative inquiry

- **The contribution of environmental education narratives to education**

Having briefly reviewed different forms of narrative in education, an environmental education researcher might pursue a similar review that specifically addresses issues around environmental education. This suggests a need to discern some uniqueness, differences, overlaps, or gaps in the field (although relationships between wider educational stories and environmental education stories remain problematic). In general, it might be argued that collaborative storytelling such as autobiography and life history has yet developed in the field of environmental education (cf. Kaufman, Ewing, Hyle, Montgomery, & Self, 2001; O'Donoghue, 2006). While review of the environmental education research will consider the prospects for narrative inquiry (see the next section), here I first focus on searching for the multiple sources and spaces in education that environmental education narratives can contribute to.

To reiterate the research interest in this study, a teacher's environmental education is assumed to generate stories about environmental education that might create cracks and ruptures in education. The discussions so far on narrative inquiry with a theoretical emphasis on 'locating' teachers' stories in a larger story corroborate the methodological assumption that narrative inquiry can contribute to a critical examination of educational praxis through the carefully developed teacher's 'voice'. Based on this perspective, this section seeks to identify further spaces in environmental education in bringing about 'changes' in education. The idea of 'change' serves a metaphorical purpose in that environmental education can be about creating cracks and rupture in school education, but this does not presuppose any particular views of making changes or specific areas of change in education. In so doing, I focus on the ways in which 'change' is made sense of in teacher narratives, not simply at the personal level but as also the institutional level. The proposition is that 'change' stories are the very kind of story that environmental education should tell in re-envisioning educational possibilities and imagination. I then explore the spaces that environmental education narratives can further support and facilitate such changes.

One of the sites where such institutional stories are produced is school reform and change processes. Elbaz-Luwisch's (2007) review of narrative inquiries into stories of change focuses on the gaps and tensions between official, 'sacred' stories and the stories told by teachers. Understanding teachers' experiences of 'reform' has been a popular theme in this regard. Craig's

(2001) longitudinal study on the teachers' experiences in association with a national project of interdisciplinary curriculum in a U.S. middle school highlights how a top-down reform influences the stories teachers live and tell. One teacher's metaphor acutely captures teachers' personal and collective knowing, in view of their dilemma and struggles to cope with reform process:

It is *The Monkey's Paw*. It appears as if it is a gift but it really is not a gift. The [interdisciplinary curriculum initiative] holds many ironies for teachers... (Craig, 2001, p.304)

The Monkey's Paw is a British short story for children - a chronicle about what happens when people are not satisfied with what they have (ibid., p.329). Through this metaphor, offering teachers a lens to interpret their reform experience, Craig began to see and read teachers' stories of their experiences of reform with connection to the plot line. The narrative exploration then enabled the researcher to illuminate the influence that state-directed reform had on teachers' stories of their school experiences, especially with respect to teacher's knowledge development and communities of knowing. It is observed that the reform process positions teachers as 'doer', not 'knower', whereas communities of knowing among teachers built around trust and support need sensitivity to such a mode of knowing practice among teachers.

In this way, her empirical study concurs with Clandinin and Connelly's (1998, p.161) characterisation of school reform as composed of "multiple nested stories interacting and changing over time". They propose "narrative mapping" to understand a complex web of stories as a way of overcoming a problem-solving storyline that assumes a linear process of problem identification, initiation of reform, and solving the problem. In this respect, the aim of narrative inquiry is not primarily concerned with prescribing the directions or substantive content of change, but it is clearly not neutral or indifferent to what happens in schools (Elbaz-Luwisch, 2007, p.371), as multiple stories implicated in the process of change begin to unravel.

This approach to educational change can be beneficial in advancing a model of change theory in a school context as it can link micro-political processes to larger stories. Goodson (2001), for example, defines three main segments in educational change processes: the internal, the external, and the personal. He points out dominance of the internal and external change model in the histories of educational change, both of which are associated with an institutional process of inventing, promoting, and implementing changes, although personal change relating to the beliefs and missions that individual agent brings to the process appears to have been neglected. Thus for

Goodson, understanding people's "life theme" or "their story of purpose" can contribute to re-connecting the institutional and the personal (ibid., p.56).

While 'stories of change' focus on illuminating the multiple stories generated in the change process that are often mandated in a 'top-down' manner, research can also seek to understand how stories of 'bottom-up' change, e.g. through teachers' own initiatives, are told and lived by teachers. Here, a particular research focus is on tracing teachers' life histories in which teachers' beliefs and orientations guide them to act for changes. Casey's (1993) study of women teachers working for social change details the ways in which different women teacher identities: as Catholic nun, Jewish, and Black, are associated with different versions of progressive discourse, and therefore distinctive concepts and metaphors are revealed through teachers' life historical narratives. She found implications of these understandings of ordinary teachers' narratives in the ways in which progressivism can be re-envisioned in the context of American education, feminism and a conservative political atmosphere. As the 'author' of their own stories, she argues, teachers are able to create and re-create social meanings, and this is how research can make a contribution to "new social languages" (ibid., p.165).

The discussion so far has touched upon some possible elements of change story in viewing teachers as agent of the story. The implications for inquiry into teachers' environmental education narratives are two fold: i) how do teachers' narratives of environmental education situated within their institutional biography illuminate, or dispute complicated, contradictory educational realities? And, ii) what sources of motivation and imagination in stories are inspiring or even exciting by creating new meanings that are personally and socially significant?

Yet caution is also required here, in thinking about the role of environmental education narratives in view of different assumptions on the relationship between environmental education and education. Do we want a fairy tale that education comes to the rescue to save the planet? Or do we want a hero character for teachers (or learners), one who resolves all obstacles and a story culminating in a happy ending? In pondering over what stories of environmental education can contribute to education, the metaphor of 'tapestry' as a sense-making tool in environmental education, and the teacher as 'tapestry-maker', can help in considering the role of narratives in relation to both environmental discourse and educational discourse. Reid (2004) uses a tapestry-making analogy for sustainability in that sustainable development discourse postulates a global task to produce the most significant tapestry. But owing to uncertainty and unpredictability implicated in this particular work, it has a crucial difference: "we cannot have full access to the front of the fabric", and "we can only weave sustainability from behind – from the present" (ibid., p.161). For

him, this makes any assessment or measurement of progress or product of tapestry-making (education or learning) problematic, and therefore it requires a shift of focus from product to 'process'.

Following this perspective, we can also think about a teacher's environmental education practice as sustainability tapestry-making, and their narratives as representing the ways in which threads of thoughts and experiences are weaved. For the teacher's work, it is clear that a sustainability discourse denotes teacher narratives of environmental education in terms of the dialectic process of life and narrative. This also leads to the view that environmental education is better understood in terms of its process through which the construction and reconstruction of educational meaning occurs, rather than its outcome, impact, or 'changes' *per se*. It might be questioned then whether the nature of environmental education, i.e. process-based, is in tension with the ideal of progressive, change-oriented narratives of education as illustrated in this section. But my point in locating environmental education as making changes in school education and teacher as agent for doing so is that teacher narratives bring our attention to looking at 'how' stories are told and retold, and by this, how meaningful learning and action is facilitated in one's own temporal and contextual horizon.

▪ The role of teacher narratives in environmental education

With this in mind, teachers' stories, which are grounded in their own experiences and sense of vision and agency, might enable us to get at deeper understandings of more tacit assumptions, ideologies, and beliefs that work up and constitute educational praxis. Hart (2003, p.63) is particularly keen in this regard to promote narrative inquiries that incorporate those methodological perspectives and practices that will address the relevant aspects of human consciousness here, i.e. teachers' personal practical theories, and political action, i.e. praxis.

In light of this, what then might be the kinds of teacher stories that are told? And what constitutes a good story of praxis?¹⁵ O'Sullivan views a good story as one that inspires and discovers educational vision and imagination:

The kinds of stories that I want to listen to are the ones that inspires me. [...] We need a great vision, and I think it our own century it's not one vision, it's a highly differentiated vision.

[...] We are going to have to proceed with multiform visions if we are going to deal with a whole new century with its own unique needs for creative expression. That being said, our visions must have feet; they must be grounded if they are going to address the amazing complex period in which we are living. [...] And so, in that way, I appreciate the stories that are actually fighting for the sense of the differentiation of the creativity of the universe in which we live in, the ones that express the deep sense of subjectivity. That is to say, the different types of interiority, and also the expanse of stories of communion – differentiated communion is so important – to have that kind of discernment, to move away from the things that do not do that, and move toward those things that make life joyful and beautiful. (*Canadian Journal of Environmental Education*, 2002, vol. 7 2, pp.286-287)

For him, the ‘technozoic story’ - the idea that a technical solution is the best vision and that this includes market-driven education. is a ‘terminal story’, not long-lasting, or life giving, and leads to “loss of meaning” (ibid., p.287). Teachers’ stories then, if well told, are ones that create new meanings for themselves and societies. Hart (2008b, p.229) especially finds resonances in genealogical study, concurring with Barone’s (1997, p.223) idea of collaborative educational (auto)biography, in that ‘good stories rattle commonplace assumptions and disturb taken-for-granted beliefs’.

But telling good stories is not a straightforward task given the different epistemological, methodological and political interests that underpin what stories do/ to tell, and how and why. Following the previous discussion on the narrative inquiry for this study, to develop teacher narratives through a narrative-discursive framework requires a careful synthesis of the methodological dispositions (and potential limits) and the previously developed theoretical and empirical knowledge and calls for further inquiry, as set out in Chapter 2. While I will further elaborate ideas about thematic and methodological proposals for the study, here I briefly discuss ways in which good stories of teachers’ environmental education can be recognised in terms of their contribution to environmental education research and practice.

To begin, it is noteworthy that the research interest in teachers’ thinking and practice has been largely driven by an analytic focus on environmental education practice, i.e. ‘what’ happens in schools or ‘what’ teachers think about particular curriculum approaches, with less attention to the ‘how’ or ‘why’ of the phenomena of environmental education *per se*. In my view, research that

¹⁵ Further discussion on telling tales in this field can be found in *Canadian Journal of Environmental Education*, 2002, vol. 7 (2), and Reid and Nikel, 2007.

focuses on the ‘what’ of the environmental education stories positions teacher narratives as objects, and doing so seems to primarily reflect an instrumentalist valuing of the stories in analysing the current practice, to inform the ways in which practice can be bettered (e.g. concept-based qualitative inquiries into teacher’s thinking in 2.1.1). Although this line of inquiry has a value of its own, a typical defect in these inquiries is the lack of explication of the ontological grounds of the phenomena. This needs to be addressed in order to progress the research field in a direction such that narrative inquiry is taken more seriously, especially if good stories of environmental education are not just about good practice and the outcomes of educational endeavours, but giving spaces to the construction of new meanings and the processes that lead to such meanings. Earlier, Hart and Nolan’s (1999) critical review of environmental education research raised such an issue of methodology with respect to teachers’ thinking research:

While interpretive lines of research have revealed details about relationships between teachers’ knowledge, attitudes, beliefs and actions beyond quantitative surveys and questionnaire data, many of these authors express the need to consider more carefully the systemic limits of teaching practice, the structure of educational institutions and ontological context. (ibid., p.25)

The research perspectives by Hart and Payne introduced briefly in 3.1.3 have variously developed how research can address the ontological context of teachers’ environmental education: while Hart’s interest is more epistemological in addressing methodological tensions in developing teacher narratives as a legitimate form of knowledge, Payne’s is more ontological in elaborating phenomenological concerns about how lived experiences can be sites for constructing human-environmental relations. In this study, the idea of teacher identity becomes the core of the inquiry in engaging with ontological and epistemological issues by questioning what teachers are up to, personally, institutionally, and culturally, when they participate in environmental education; or put simply, *what does it mean for a teacher to be an environmental educator?* This question can shed light on the ways in which the multifacetedness of the phenomena of environmental education can be interpreted from teachers’ points of view, but crucially, not descriptively but critically. The inquiry clearly goes beyond the boundary of the instrumental use of teacher narratives, in raising issues about why it is important to understand teacher narratives as a window into realities, and in what ways reading teacher narratives informs us in thinking about what environmental education should be.

Considering the purpose of telling teacher narratives in this way, the question of ‘good stories’ in this study can be explored in terms of how the research helps readers develop a sensitivity to

teacher narratives in that they get into how stories become meaningful in different ways: to teachers themselves, intersubjectively in terms of teller-reader relationships, or critically from a particular 'standpoint' (researcher, educator, student, etc.). Thus, good stories of teachers' environmental education that narrative inquiry can generate are not so much about any particular good 'examples' of environmental education approaches or 'right' methods that guide to such practice, as they are about creative spaces in which multiple meanings in describing and knowing educational realities are explored. As Hart (2002b) states:

Our interest was not in turning stories of teacher discourses-practices into concepts, or theories, or the grounds for explicating forms of social action. Rather, we regarded teacher thinking as a means of dialogue for the benefit of educators, and in exploring the possibilities of theorizing *with* stories instead of *about* them. (Hart, 2002b, p.155, my emphasis)

Hart's interest in distinguishing narrative inquiry from other methodologies grounded in positivist and post-positivist epistemologies has been to explore alternative possibilities in discussing the 'quality' issues that anti-foundationalist, post-modern critical hermeneutic inquiries are faced with. While issues about quality and representation are essential to legitimatise one's research as an inquiry (and my positions and reflections on the issues will be discussed in Chapter 4), with respect to the dialectical, and often messy, research processes, there is also an issue about how narrative inquiry can engage with 'theorising with stories', given the inquiry's role of 're-storying' participants' accounts of their experiences and managing risks of distorting the realities. In other words, my intention here in explicating theoretically informed themes and concepts (in the next section) is to articulate my own understanding of how to 'theorise with stories'. Bell (2003), in introducing her narrative inquiry-based doctoral research, demonstrates this by clarifying her own way of using narrative concepts such as 'narrative', 'story', 'metaphor', 'narrative threads' and 'narrative field' as metaphors themselves in the research, to see how these come into play in analytic phases of research process. In engaging with the theoretical perspectives that can inform the narrative-discursive approach in this study, based on their links to the research themes, my intention is to begin to participate in a more reflexive research process in the ways that tensions between theory and practice in conducting the research project are recognised, which is the very criteria required for narrative researchers in developing their own capacities for authoring (by re-telling) the stories that emerge and evolve along the research process.

3.3. Teacher narratives in this study: themes and concepts

The discussion in 3.2 focused on the ways in which narrative inquiry into teachers' thinking and practice can contribute to environmental education and education research and practice. Now the design of the narrative inquiry is specified by incorporating the research themes in the study - teachers' life experiences, professional identity, and environmental curriculum as identified in Chapter 2 - into the narrative inquiry perspectives, by examining themes and concepts informing interpretive and analytic strategies for empirical work, while Chapter 4 further discusses how foci of inquiry were further characterised and limited by the interview designs and eleven teachers' stories, concerning three major themes of research inquiry as follows:

- Teachers' life experiences as a legitimate source that contributes to sense-making about environmental education.
- Teachers' professional identities and voice in school institutional context.
- Teachers' environmental curriculum narratives as windows into the cultural practice of meaning construction in relation to the environment.

3.3.1. Teachers' life experiences

▪ Self-understanding and environmental identity

Although studies on teachers' thinking and practice (see 2.2) contributed to revealing and challenging gaps between discourses and realities in school education, little attention was paid to teachers' motivations as an important research theme that is something that may be more deeply embedded in teachers' thinking. In fact, my research interest originated in the awareness of such a blind spot and blank spot in the research field (see 1.1.1). Asking teachers, "How did you come to be engaged in environmental education?" was intended to generate teachers' stories in the way that their rich and vivid life experiences are recounted, and in so doing, teachers would be encouraged to reflectively construct the meanings of their actions within their own contexts.

Regarding this, Nikel's (2005) study of student teachers' sense-making of ESD suggests various concepts and ideas - beliefs, decision-making, agency, and norms in their thinking - which might also be key elements in weaving threads of life experiences. In Hart's (2003) study, Canadian teachers' stories of their environmental education experiences are introduced in the way that 'reasons' for teachers' participation in environmental education are recounted, including:

- A love of nature
- A love of the out-of-doors
- Parental influences
- The influence of a special teacher or professor
- Because of the kids
- Because teachers are parents
- Because of personal values

Each teacher's story tells of how the teacher's thinking and practice in environmental education evolved and the story becomes a site for moral reasoning about teachers' work and responsibility. More recently, Hart (2008a) takes autobiographical narratives as "precursors" to participation and action in environmental education that "include environmental influences through the life stages, particular sources of influence, as well as personal ways of knowing the environment" (ibid., p.207), and also as a means to tracing personal life histories and socially shaped identity construction processes that constitute particular (e.g. intergenerational) discourses-practices of environmental education. While Hart's inquiry into teachers' life experiences focuses on 'environmental education' itself, studies of life experience and environmental identity formation have also noted the value of autobiographical storytelling as an individual's or group's sense-making tool¹⁶ which is what this study is concerned with. A few studies are worthy of attention in terms of the interpretive framework that is beyond Hart's work.

Kitchell and colleagues investigate stories of two environmental movement groups in terms of identity development (Kitchell, Hannan & Kempton, 2000). Group-stimulated stories in each group were used to facilitate collaborative storytelling and sharing of their experiences among the members of each group. In analysing the stories in relation to the group's environmental identity that are oriented toward personal lifestyle and political activism, respectively, the authors propose the idea of 'story function', that is, how storytelling affects a member's personal and collective identity formation and leads to action in ways that are congruent to the group's goal. They claim that "stories mediate the formation, or reconstruction of a new identity or may reaffirm an existing one" (ibid., p.104). Meanwhile, two studies by Korean researchers highlight the contribution of autobiographical narratives to the conceptualisation of environmental identity. Joo's (2005) study of environmental identity formation was based on a biographical method that traced one university

¹⁶ For example, environmental psychologists also stress the value of life experience in developing more integrative approaches to environmental identity that include psychological development, sense of place, action, and ethics (Clayton & Opatow, 2003).

student's life experiences in relation to his participation in the environmental movement. The analysis presents the reconstruction of the student's life experiences by exploring the ways in which environmental identity became the salient part of his personal identity. The researcher then attempted to theorise the significance of environmental identity formation as a learning process, by characterising three levels of educative significance of environmental identity formation from the empirical findings. These were that identity development involves: i) more than pro-environmental behaviour, ii) critical reflection on and engagement with environmental issues in one's personal context, and iii) a reflexive process through which self-understanding and environmental identity are continuously reformulated. Kim's (2007) study of environmental education participants' retrospective narratives is also concerned with understanding the ways in which autobiographical storytelling constructs meanings of personal life experiences. In analysing the participants' interpretation of the programme experience in terms of its significance on their later life (e.g. becoming environmental educators or activists), it is argued that key metaphors or ideas such as 'seed', 'textbook' etc. as a way of making sense of personal significance are useful tools for understanding environmental identity as constructed through narratives.

These studies have in common an interest in the use of autobiographical narratives as a tool for understanding one's environmental identity. While the studies are mostly concerned with the personal meanings of environmental experiences constructed through storytelling, attention is also given to the perspective that meaning is cultural and social construction as much as it is a personal construction. Furthermore, the studies' analytic focus lied in the themes and contents of the narratives, and these are only a small part of the possibilities for narrative analysis given the discussions and illustrations in 3.1.1 (especially Table 3-2). For example, the assumption in the study that environmental identity formation and development 'occurs' relied on storytellers' accounts of their sense of 'agency': finding goals and means to take action, etc.. However, this was without any detailed analysis of narrative structure or qualities and their relationship with the concept of narrative identity. In this respect, understanding the meaning of life experiences requires more attention to the characteristics of narrative itself which follows the next section.

▪ **Agency and temporality in autobiographical narratives**

Ricoeur's theoretical work has been a key contributor to the ways in which 'narrative identity' can be theorised (e.g. Verhesschen, 2003; Teichert, 2004). Ricoeur (1985) distinguishes two different concepts of identity: identity as sameness (*'mêmeté'*) and identity as selfhood (*'ipséité'*). The former refers to the continuous engagement with reidentification over time in one's life. The latter

concerns aspects that are beyond reidentification, such as how one explain actions in the light of ethics and norms. According to Ricoeur, narrative identity is characterised by a dialectic relationship between the two modes (Ricoeur, 1992). At one level, the individual's narrative identity can be understood in terms of one's 'character' (who they are), and at another, a 'promise' (who they shall be) in that people engage in practices, and at the same time, they plan their life, or have their life planned, by orienting and organising activities over time in accordance with needs, goals, desires, responsibilities and opportunities, for example (Teichert, 2004). Ricoeur's theory (1991) also elaborates the time perspective in narrative. For him, temporality is fundamental to emplotment, and composing a story involves a double operation of time: that is, "configuration" out of a "succession" (ibid., p.22). Yet what is configured is in a dynamic relation to the prefigured and the refigured. Narrative characteristics such as sequence and chronological order of time can thus be seen as a narrative achievement, or even an "illusion" (Roberts, 2002, p.83).

Thus, to avoid the trap of realism takes a narrative researcher away from the factuality of the event itself. As with Chatman (1981), who makes a distinction between 'storied-time' and 'discourse-time', and 'events-as-lived' and 'events-as-told' (cited in Connelly & Clandinin, 1990, p.7), the latter is what narrative inquiry is concerned with. Researching 'significant life experience' in this way is then not about establishing general patterns and predictability, but about generating educational possibilities that surpass the stories of the current times (Gough, 1999b). Roberts (1999; 2002, p.123) observes that notions of time are related to the functioning of plot in narrative analysis in that "biographical experience is given an understandable shape" (Roberts, 1999, p.21). The significance of the events can be interpreted with respect to a time dimension, such as in utterances about 'timing' or 'turning points'. Thus in Joo's (2005) and Kim's (2007) study, the idea of environmental learning was explored in that particular events were interpreted as triggering identity transformation or significant life experiences.

If memory can be selective, and time sequence is an 'achievement', how can a researcher justify the quality of memory work? Tierney (2000, p.545) locates life history between history and memory in arguing that memories are built up and articulated in a collaborative setting between researcher and storytellers. Thus, a recollection of memories in part reflects the contexts of the common interest shared by the research activity, in the attempts and strategies to articulate and understand personal experiences with cultural and historical resources. In this view, life events are not only about what is deemed to be personally significant, but also culturally relevant. As Bruner (1991) suggests, culture provides discursive resources in talk: the "canonical narratives" of a culture. Other psychologists have noted this too in varied ways: "social and cultural frameworks of interpretation" (Mishler, 1999, p.25), and the "interpretative repertoire" (Wetherell, 1998). Memory

work can also be a feminist methodology exploring and challenging women's socialisation, as has been noted in the environmental education field (Kaufman, Ewing, Hyle, Montgomery, & Self, 2001).

As researchers of teacher career and identity development point out (see 2.3.1), teachers' stories when combined with a historical approach can acquire sociological meanings related to an individual's sense of agency and constraints. As for the forms of narrative, the degree of the continuity of past–present–future can shape narrative as progressive, regressive, and so on (Lieblich, Tuval-Mashiach & Zilber, 1998). It requires not investigating the reality of social and cultural influences on the teacher's identity construction, but rather exploring how past events and experiences are interpreted by teachers when they explain the reasons and consequences of acts and decisions.

Connelly and Clandinin (1990) also identify the centrality of plot and time in structuring the narrative. With Carr (1986), they relate the structure of time to three critical dimensions of human experience: (past) significance, (present) value, and (future) intention, each of which are composed of narrative meaning (ibid., p.9). This idea seems especially relevant to explorations of the (dis)continuities of narratives. As for teachers' stories of environmental education, the value of teachers' doing so (present) can be related to explicating the significance of past experiences such as environmental experiences or professional opportunities, and with respect to the teacher's intention concerning what they aspire to do in the future. Examples of continuity (or discontinuity) or flow may offer insights into how environmental education is meaningful for them in terms of pursuing teaching career and thinking about their vision, while the researcher may attend to the status of and interplay between prefigurations, configurations and refigurations.

Meanwhile, in understanding teachers' sense of agency as they recount life experiences in relation to their personal, professional, and environmental identity formation, we might further ask, "So, what is the value of their stories?" Watson (1999) pursues this question by examining the rhetorical strategies used in women activists' autobiographies in spite of the use of different rhetorical skills and the different extent to which they are achieved. Using a Burkean model (see 3.1.1), Watson's analysis shows that the women activists' autobiographies illustrate the tension between *the scene*, that is related to "what is", in terms of the materialistic and structural conditions and realities in which these women live, and *the purpose*, that is related to "what ought to be", for things to get better (ibid., p.104). Within this common narrative structure, women activists position themselves as the agents who struggle to alter the scene. Watson then argues, their autobiographies have achieved their rhetorical purpose in ways that invite readers to seek identification and gradually

develop understandings of the causes, endeavours, and struggles of the characters. It is also argued that these achievements in autobiographical writing can contribute to “expanding a rhetorical space” for a discussion of women’s rights, through an established bond between reader and author in ways that provide unique persuasive opportunities (ibid., p.118).

If the same can be applied to the analysis of teachers’ narratives, the focus of this study will be on i) identifying the relationships between these five key ideas that constitute the uniqueness and situatedness of individual teachers’ stories, and ii) further examining the value of rhetoric, i.e. teachers’ claims and explanations of why environmental education is a valuable thing to do. For example, do teachers’ narratives construct teachers’ agency as something heroic in terms of the scenes where teachers’ acts occur, and in relation to the purposes that they ascribe to their vision of education, are these coherent? Or, do they present an idealistic discourse in the way that the purposes of their action became the most prominent part of the plot? Or, with the women activists’ narratives in Watson’s study, are teachers’ narratives, in particularly, their rhetorical characters, associated with a rift between public discourse and teachers’ personal narratives in envisioning the aims of education and teachers’ roles? If this is the case, what are the grounds in thinking about the power of teachers’ narratives for expanding a rhetorical space?

In summary, this section identified the value of autobiographical narratives as a tool for understanding teachers’ stories about their motivation for environmental education in relation to the sense of agency and identity formation, and addressed the significance of the concept of temporality and emplotment in understanding the meanings of stories for developing analytic strategies.

3.3.2. Teacher voice and professional identity

- **Role and identity**

The review of teacher story genres (3.2.1) indicates different types and modes of representing teachers' voices and making visible their identities. The issue of authorship was pointed out given the different research agendas and contexts that influence teachers' telling and subsequently storylines, i.e. whose voice and whose stories are told to whom. The typical storylines of environmental education, for example, adopted by the official school curriculum, are based on taken-for-granted assumptions about the teacher's role and responsibilities. The stories can take (or favour?) a particular form of talk about teachers' thinking and practice, that is, talk mostly concerned with interventions and implementation, often as mandated by the official curriculum, and the subsequent effectiveness and outcomes of teaching and learning. The focus on teachers' personal life experiences and the role of their stories in making sense of educational realities can thus become crucial for broadening or re-conceptualising the languages of teachers' roles and responsibilities as something more than mandated ones, if such talk is not the only talk sought or available.

In this respect, it is necessary to identify different dimensions and origins in teachers' identities through teachers' narratives of environmental education. The review of the research on the value of teachers' life stories and the personal practical nature of teachers' knowledge (2.1 & 2.2) indicates the mixed characteristics of teacher identities that are culturally available and personally constructed by teachers when they participate in environmental education. Given this, the personal and professional dimension can be separable, at least conceptually, in interrogating the relationships between the 'official' and the individual teacher's personal narratives (Figure 3-1). Another axis can be drawn through the distinction between environmental discourses and educational discourses as sites for producing 'environmental knowledge'. With these distinctions then, the analytic focus can investigate teachers' narratives as windows into the discursive practices of environmental education. The basic tenet of this framework in analysing the realities of school environmental education is to investigate the ways in which teachers' personal orientations to environmentalism, i.e. their environmental identity, can be realised in the pedagogic practice, through the means of professionalism. Furthermore, inquiries of how compatible the two discourses are, and what the characteristics of the environmental education practices are, e.g. diversity, preference, dominance, etc., can also be generated.

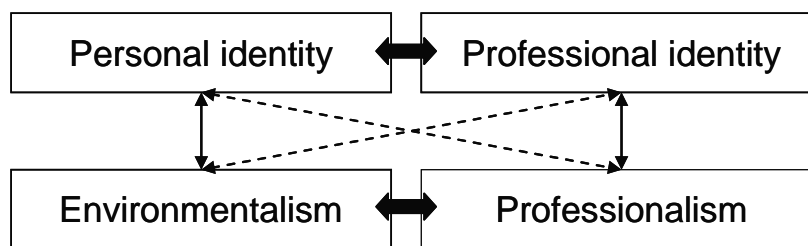


Figure 3-1 Hypothetical dimensions of teacher identities in relation to environmental education

This perspective is particularly relevant in analysing the institutional context that shapes and constrains teachers' narratives. A similar framework was found in Czarniawska's (1997) narrative approach to Swedish public institutions, which investigated identity crisis and the pursuit of change in roles, through leaders' stories as sets of opposite traits of role (profession) and identity (personality), and analyses of the tensions and cracks that exist between two (pp.32-33) (see Table 3-4).

Table 3-4 Dramatism analysis of role and identity (Czarniawska, 1997, p.32)

	Social role	Personality
Agent	Representing the interests of others, not one's own. Types, not individualities.	"Sincere" conduct (acting in accordance with one's own beliefs). Illusion of vitality (not stereotypes).
Purpose	Simple motives (easy to understand, constant, and coherent).	Coping with complex situations.
Scene	Consists of a static role structure ("friends" and "enemies", "bad guys" and "good guys", "progressives" and "conservatives", "cons" and "dupes").	Constantly changing alliances, the need to compromise and cooperate.
Agency	Observing the well-known albeit unwritten rules, repeating successful tricks.	Constant improvisation, whereby the material is taken from whatever is currently of interest.
Act	Incessant action effect.	Constant talk, high mobility.

The study documented here has been interested in understanding such gaps between personal identities and institutional roles in terms of two foci. Firstly, it is concerned with the question of "who is an environmental education teacher?" In the situation where the strict subject division obstructs the interdisciplinary environmental education, how do teachers who are oriented to environment-related teaching, see their role as a subject teacher, for example, a science teacher? And how do pupils see these teachers' approaches? When teachers position, and are positioned by, particular teaching subjectivities, what are the gains and costs? Interrogating these topics can

expose the ways in which teachers might make cracks and ruptures in the practice of education, in particular, by revealing the institutional processes that reify, legitimate, and/or dominate the language of environmental education teacher. The second focus lies in the identification of the multiple positions and perspectives that influence the forming and reforming of the teacher's preferred views and practices of education and environmental education. This is followed by analyses of curriculum practice as sites in which contestation and negotiation concerning meaningful pedagogic knowledge, (i.e. 'worthwhile' environmental knowledge to be taught and learnt) occurs through various pedagogic relationships e.g. teacher-teacher collaboration, teacher-pupil instruction, or pupil-pupil interactions, and forms of teaching and learning.

- **Sociological accent**

From this perspective, we can anticipate that teachers' narratives of environmental education can be sites of multiple voices, identities and positions that are available to the teachers. Narrative psychology is an area of study of identity construction through people's narration of their lives with the tenet that "people are meaning-generating organisms; they construct their identities and self-narratives from building blocks available in their common culture, above and beyond their individual experience" (Lieblich, Tuval-Mashiach & Zilber, 1998, pp. 8-9). While the traditional approach to autobiography and narrative psychology focuses on the concept of self in terms of 'processes of construction and reconstruction of personal experience', a recent move toward postmodernist frameworks stresses that identity is not a product or a given, but in process and thus potentially ever changing (De Fina, 2003, p.17). The idea of 'a reflexive construction' (Brockmeier, 2000) epitomises this point. Thus Sfard and Prusak (2005, p.16), in view of the experience and reality of a lifelong learning process, define identity-making as a communicational practice, i.e. identity occurs and is shaped through social learning, and thus they reject the essentialist claim that seeks to understand identity as properties or in terms of extra-discursive entities.

The focus on 'construction' of identity, rather than the essentialist notion of self-concept in identity studies concurs with a social constructionist approach to reality that is based on the premise that social realities too are constructed and not given (Berger & Luckman, 1967, p.84). If identity is regarded as an accomplishment in a social and interactive context, the substitution of the singular term, 'identity', with the plural alternative, 'identities', becomes inevitable. Such a notion reflects the idea that there are cultural repertoires from which choices are socially available to individuals and groups (De Fina, 2003, p.16). Thus for Hall (2000, p.16), identity is a discursive work, a series of 'identifications', a never-ending process of construction, deconstruction and reconstruction.

For narrative inquiry, this take on identity requires seeing narratives not only as a form of discourse, but also as about verbal action and communicative tools. Sociologists have developed this interest in investigating how people make sense of their personal experiences “in relation to culturally and historically specific discourses, and how they draw on, resist, and/or transform those discourses as they narrate their selves, experiences, and realities” (Chase, 2005, p.659). One way of linking a concern with identity and identification to larger societal and structural matters is in terms of the cultural and social processes of ‘categorisation’ of identity, e.g. the ‘roles’ of teachers in a society. De Fina (2003, pp.184-185), using van Dijk’s (1998) concept of ideology, argues that the representation or construction of the self in different contexts cannot be understood without reference to wider social processes and cultural expectations, an example of which is the generalisation of specific classification practices.

From this perspective, it follows that conversations about education, and teachers’ talking about their concerns and perspectives about environmental education, are always and already impinged upon by ideological constructs of teacher identities. On the other hand, such categorisation can be resisted by teachers through an active reformulation of the language, or narrative strategies, producing new meanings for teachers’ roles and professionalism in ways that “disrupt naturalized associations between specific linguistic forms and specific social categories” (Bucholtz & Hall, 2005, p.591). Therefore, analysing how the identity concepts of environmental education teachers are understood and articulated in teachers’ narratives might also be concerned with the dual character of an identity process, that is, the intended and unintended inter-links between individual and structure, and micro and macro scale, as well as the continuities and discontinuities between them.

In developing ideas about ‘environmental education teacher identities’ in this way, the study’s focus can now be distinguishable from a strictly poststructuralist approach in that the analysis is concerned with investigating the identity construction process and its dynamics by assuming that reading the narratives beyond the frame of a particular discourse/subjectivity is itself meaningful in exploring possible meanings of teachers’ professional identities.

In summary, this section identified the importance of social constructionist view in examining teacher professionalism as reflexive identity work process, for the use of teacher narratives as deconstructing the normative definitions of teachers’ work and role and further exploring the rhetoric espoused by teachers by representing their voices.

3.3.3. Environmental knowledge and curriculum

- **Teacher as curriculum maker**

The final focus of this study is concerned with the narrative form that is “interwoven with a broader cultural set of fundamental discursive orders that determine who tells which story, when and where, why and to whom” (Brockmeier & Harré, 2001, pp.41-42). Looking at curriculum practice as a sense-making process in this respect offers pertinent points in which environment-related teaching and learning approaches and methods can be analysed in relation to the ways in which culturally prevailing or dominant forms of narratives are ‘translated’ into pedagogical modes, and in this process, the ways in which knowledge production (such as cultural production, reproduction, or transformation of meaning) might occur and be negotiated or resisted.

To achieve this, my key assumption is that teachers can be seen as curriculum makers and teaching can be seen as a form and example of storytelling. As pointed out in the review of scientific literacy (see 2.3.2), the use of narratives in teaching and learning ‘about’ science, especially in relation to socially controversial issues has been recognised in helping teachers develop pedagogical approaches that are beyond knowledge-, and concept-based science learning. Narrative researchers also note the importance of teachers’ narrative competence. For example, Gudmundsdottir (1991, p.214) understands teachers’ curriculum stories as consisting of pedagogical content knowledge that is shaped through a narrative way of knowing. By analysing the narratives of two experienced social studies teachers in terms of their ‘making’ and ‘telling’ of their own stories, she identifies some elements of good stories such as continuity, events, and characters. The tools that are used in re-configuring narratives are reflection and transformation (Gudmundsdottir, 1995). In this view, it is believed that teaching is understood basically as the making of meaning, like “writing a story”, and “the understanding of teaching is like arriving at an interpretation of a story” (Gudmundsdottir, 1991, p.217, by using Polkinghorne, 1988, p.142). Carter (1993, p.7) makes a similar point in making a case for the study of narrative structures of teachers’ curriculum knowledge in ways that foreground the interpretive and inventive processes involved in teaching. Her work on teachers’ well-remembered events attempts to capture a fundamental process going on as novice teachers learn to teach (Carter, 1994). Overall, this approach to teachers’ knowledge is grounded in the belief that teaching is based on the teacher’s personal resources, values, and life experience (Elbaz-Luwisch, 2007, p.364).

However, there has been less emphasis on the ways of interrogating different sites for the production of knowledge in wider society. For environmental education, this is crucial given that

the definitions and meanings of what constitutes environmental knowledge or pedagogical approaches are contested and subject to changes depending on particular local and global environmental issues. Also, interdisciplinary approaches that are often required for subject teachers entail changes in the teacher's 'script'. Therefore the point here is not to identify criteria for 'good stories' and their relationship with 'good teaching practice', but to explore the signifying processes that involve the construction of meanings concerning the environment in an educational or pedagogical sense¹⁷.

▪ The role of science stories

For the researcher, mobilising and examining one's own knowledge about subject content is beneficial, if not essential, for identifying core ideas and issues in the curriculum-making process. My background in science education and the choice of selecting science teachers as the main party in the inquiry was paramount to developing the focus on science-focused environmental curricula. My major concern was to explore the relationship of pedagogical knowledge with different narrative genres of science in relation to environmental discourse, such as science journalism, professional science discourse, and science education.

Harré *et al.* (1999) analyse different discourse subtypes in which "Greenspeak" is articulated, ranging from natural to scientific, moral, and literary narratives. Among many possible and existing genres of environmental narrative, they note that "Bildungsroman" serves to outline possible ecological scenarios of development that a protagonist (humanity, Western culture, civilization, technological progress, the children of the third world, etc.) is expected to go through, and interestingly, even scientific writing often takes this narrative form than a logical exposition of hypothesis and deduction.

Killingsworth and Palmer (1992) analyse the 'scientific activist' narrative in greater detail. In critically examining three prominent scientists' writing including Aldo Leopold ("*A Sand County Almanac*"), Rachel Carson ("*Silent Spring*"), and Barry Commoner ("*Science and Survival*"), they

¹⁷ With respect to this, Stables (1996, 2005) proposes a research approach that sees 'classroom as texts' in analysing dialogic process and interactions between pupils and teachers from literary theory and cultural studies perspectives. Also, from a poststructuralist point of view, it is argued that any particular teaching action cannot be seen as 'good educational practice' or, that solely identifying the features of teaching is sufficient (Stables, 2005, p.199). While this perspective is helpful, my focus here is limited to textual analysis of teachers' narratives to explore teachers' intentions and points of view, given the constraint that the data solely relate to teachers' accounts, rather than, say, observations.

discover the common rhetorical strategy adopted by the authors, that is ‘cross-over’ from the scientific facts to the ethical *ought* (ibid., p.53, original italic), for example, scientific objectivism to mysticism and dramatization in presenting scientific facts. In contrast, the official mainstream discourse among communities of scientists tends to be characterised by the rhetoric of ‘distance’ between the scientific area and the public realm of environmental politics, in the form of a set of oppositions that include, i) natural history vs. theoretical science, ii) familiar language vs. scientific language, iii) human interest vs. natural science, iv) applied research vs. basic research, and v) gray literature vs. refereed literature (ibid.). As rhetorical strategies among different scientific discourses diversify in ways that reflect the contested politics of meaning-making, a question arises in relation to the similarities, differences, or distinctiveness of the pedagogical discourse of science education or ‘environmental education’. In other words, does a teacher’s rhetoric for environmental education favour a specific genre of environmental narrative? Furthermore, what is affirmed, or co-constructed as a good story, e.g. by teachers and/or pupils in the ‘educational’ sense?

In acknowledging scientific discourse as central to organising curriculum narratives, the prevalence of scientific knowledge in different media and narrative forms becomes clear. This brings popular culture into broad focus. For example, “*Enviropop*” (Meister & Japp, 2002) offers understandings of how common sensical environmental knowledge is constructed and reinforced in ways that mediate people’s awareness and ways of thinking. A prominent example is the analysis of the cultural phenomena of ‘well-being’ that in recent years has become a popular public concern together with the media promotion or selling of a healthy and sustainable life style. A rhetorical analysis of the American TV programme “*The Good Life*” by Japp and Japp (2002) demonstrates how visual and verbal dramas construct the meaning of ‘the good life’. In popularising the idea of ‘voluntary simplicity’ as a new lifestyle, the stories of individuals who pursue this are presented as a psychological search for self-actualisation. In this process, political issues are reduced to only the matter of individuals’ consumption actions in a way that ironically, nature becomes a resource for a purchase, “framed in and contained by assumptions and connections to consumption” (ibid., p.93). Aside from such a TV programme genre, environmental images and artefacts are everywhere in our lives: advertisements, cartoons, films, news, postcards, textbooks, the Internet, etc. A critical perspective on cultural narratives requires greater attention to the commodification of nature and environment, and how that conveys a cultural ideology of global capitalism and consumerism (Meister & Japp, 2002). Taking the ideological function of popular culture into account in analysing the curriculum practice then entails the assumption that pop culture will also influence the construction of meaning related to environmental awareness, knowledge, ideas, values, and behaviour, each of which are central concerns in environmental education.

If curriculum practice is to be analysed as a sense-making process then - as a site of knowledge production - it is also possible to take this critical perspective in analysing whether a signifying practice of environmental education results in reproducing prevailing, dominant cultural knowledge and ideas relating to how we think of and act 'for' the environment, such that it then becomes an institution or 'regime of representation' (Plec, 2007) unlike any other, or is there any potential for appropriating and transforming the common, cultural ways of meaning-making through teachers' and pupils' pedagogical practices?

In summary, this section has articulated key assumptions about the ways in which teachers' environment-related curriculum practice can be seen as reflecting, negotiating, and possibly further challenging, cultural narratives of the environment, particularly science stories, therefore exploring the value of teachers' curriculum stories as meaningful action for developing environmental and pedagogical knowledge in ways that goes beyond the standard range limited in the national curriculum.

With the premises and theoretical perspectives on three research themes then, Chapter 4 presents an account on how these themes were incorporated into further research designs and interview processes, by generating teachers' stories of their environment-related experiences within the framework of narrative-discursive approaches.

Chapter 4. Developing teachers' stories and methods of analysis

❖ Chapter introduction

As predicated by Chapter 3, teachers' stories are the main data source for the study to understand the phenomena of environmental education from a teacher's point of view. This chapter describes the actual research process of fieldwork and the ensuing interpretation processes that were designed and developed dialectically with the theoretical perspectives of narrative inquiry outlined in the previous chapter. In so doing, the chapter addresses four main themes:

- The interview designs and the methods for fieldwork;
- The processes in which teachers' stories are developed through interviews;
- Issues of representation and quality in narrative inquiry, and;
- The ways in which narrative analysis is developed.

Thus, the chapter aims to demonstrate research reflexivity and legitimatisation regarding the representations of teachers' narratives of environmental education from the emerging perspectives that the researcher gained throughout the inquiry process, with the following in mind:

Every narrative is a highly constructed text structured around a cultural framework of meaning and shaped by particular patterns of inclusion, omission, and disparity. The principle value of a narrative is that its information comes complete with evaluations, explanations, and theories and with selectivities, silences, and slippage that are intrinsic to its representations of reality. (Popular Memory Group, 1982, p.228, cited in Casey, 1995, p.234)

4.1. Searching for teachers

In initiating an account of my fieldwork experience, this section introduces a reflective account of the processes of searching for teacher participants for the study by focusing on the dialectical relationship between theoretical categorisations and pragmatic decisions, and the characteristics that emerged through the inquiry process.

4.1.1. Who are “environmental education teachers”?

In developing research inquiries into the phenomena of school environmental education from a teacher’s point of view, the choice of narrative inquiry as a research methodology became a major influence on the interview methods and design. With the goal of the interviews being to generate rich stories about teachers’ personal thinking and experiences, the initial interview design featured conceptual, thematic and pragmatic characteristics.

The characteristics of teachers’ environmental education that the study sought to investigate were primarily concerned with teachers’ personal commitments and motivations. Therefore, although teaching about environmental issues has been mandated throughout the curriculum and school activities in Korea, a distinct criterion was the teacher’s own recognition of this requirement. This was crucial given the research assumption on environmental education as creating the possibility for cracks and ruptures in school education. But of course, it was also expected that teachers’ commitments and initiatives would vary, as would their perceptions:

“I am not aware of any of policy documents or international agreements. Probably I am not the right person you are looking for. I am not teaching the Environment subject. Although I am participating in the Teacher’s Group, teaching about environment accounts for only a little part of my teaching. So, I don’t think I am an *environmental education teacher*.” (Lee, 18, April, 2005)

This quotation is from an email that Lee sent in reply to a request for an interview. In my email, I mentioned some policy and international documents in order to make the point that my research interest was in understanding what teachers think they are doing, which may be somewhat different from official discourses. Indeed, the identification of ‘environmental education teachers’ was problematic for a variety of reasons. Interestingly, most teachers did not seem to see themselves as

‘environment teachers’ (as it is translated in Korean). In fact, the term was confusing given the existence of the ‘Environment’ subject in secondary schools. Instead, the term ‘environmental education teacher’ seems to better serve the need to refer to teachers who participate in environmental education in their own contexts. However, ‘environmental education’ is still problematic since subject teachers see their environment-related activities as only part of teaching, while the term ‘environmental education’ seems to put more emphasis on the environment itself. Therefore, throughout the process, I attempted not to give teachers the impression that an environmental education teacher has associations with any stereotypical labels, such as exceptional or eccentric teacher, or a political activist. Regarding this, Casey (1993) reports a similar experience in her research on ‘progressive’ women teachers’ life histories. For her, the possible political label of activist made some teachers feel wary and put off their interest in participating in the research interviews (p.14). This was crucial for assuring the diversity of teacher participants and interview process to be open-ended rather than framed by theoretically driven categories and conceptualisations of identity of images of teaching, and eventually in developing the analysis of teacher identities and professionalism as reflexively constructed in Chapters 5 and 6.

Eventually all the teachers I contacted at least agreed to participate in the interviews, although personal circumstances did not allow few of them for doing so. But before interviews began, it seemed that we all had the same question: “what do we mean by environmental education?” While the meanings of ‘environmental education’ should be intrinsically diverse, at least two distinct groups of teachers could be identified. The first conceptualisation was concerned with the aim and criterion for the interview addressed so far, and I call this group ‘environmentally conscious teachers’. The second conceptualisation was more concerned with environmental education as a ‘given’, that is, as the direct responsibility of a teacher. In Korea, ‘Environment teachers’ are mandated to teach the optional Environment subject in secondary schools. Fully qualified teachers are expected to have an undergraduate or Masters degree of which the main subject matter is composed of ‘environmental education’ and environment-related disciplines and passed teacher examination – who belongs to the first two categories in Table 2-4. Collecting and analysing the stories of the two ‘types’ of teacher should be effective in addressing themes of plural ‘identities’ in conjunction with research theme 2: teachers’ professional identities (see 3.3.2).

The term ‘environmentally conscious teacher’ may be seen to imply a degree of teacher reflection and deliberation wherein a personal environmental orientation meets that of teacher professionalism, while an ‘Environment teacher’ may also attend to this process, but presumably the other way around should be a distinct possibility. Such a categorisation, however, cannot be essentialised nor should it be used to compare or contrast the two groups given the discussion

above. Rather, a key element of the inquiry was how different definitions and perspectives on environment teaching can be produced within the conditions of the current school system in Korea; in other words, what, to what, and for what, for example, are teacher reflections and deliberations taking place?

Therefore, as a common frame for every teacher, the interviews set out to address three issues:

- What does engaging in environmental education mean to a teacher?
- What are recognised as enabling and constraining factors for doing so?
- How are environment-related experiences interpreted in terms of the teacher's life course and identity formation?

At the very beginning of the interpretation process, these issues served as a useful frame to find out key concepts and foci that developed into the narrative analysis in 4.3 (two examples of application are provided in Appendix 4.1.5).

However, it should also be noted that a different interview strategy was adopted in the two groups. In developing the interview framework for the first group, two science teachers (Han and Lee) were interviewed in a pilot phase of the study, and a tentative analysis of the two teachers' stories served to identify, amongst other things, that teacher narratives often stand in direct contrast to the official, institutionalised narratives that prevail in schools (see Appendix 4.1.1). While this observation seemed to confirm my assumptions about the nature of teachers' environmental education in Korea, the narrative inquiry would go deeper to generate more reflective thoughts about what is embedded in teachers' practice, be it radical or not. Further interviews with more teachers took place within a framework of life stories. While a biographical interview (Atkinson, 1998) can be as wide as the whole lifespan, the focus in the study was on the teacher's environment-related experiences encompassing personal environmental experiences in relation to human-nature (environment) relationships, and teaching-related experiences that address environmental concerns. But rather than trying to identify unique or common categories or qualities of such experiences, talking about personal experiences was intended to invite teachers to reflect on their own thinking and practice in relation to the environment, education, and environmental education, in the way that not only were individual's unique characteristics represented but also teachers and the research could collaboratively recognise and sensitise the issues concerning what is seen as 'environmental' 'issues' or 'education' in the current cultural and social context in Korea (see 4.2.2) (interview design and initial analysis in Appendix 4.1.1 and 4.1.2).

Meanwhile, the stories of Environment teachers could be construed as a window into an institutionalised version of environmental education that is often not represented, for example, in the guise of official discourses, such as the official curriculum, within certification and assessment of environmental learning, or in teacher training policy. Conducting focus group interviews with four teachers was expected to illuminate gaps between official discourse and the actualities that environment teachers encounter, by enabling the capture and analysis of a proliferation of multiple meanings and perspectives, as well as evidencing their collective identities through the interactions between participants and between a researcher and participants (Kamberelis & Dimitriadis, 2005, p.904; Interview design in Appendix 4.1.3).

4.1.2. Eleven teachers in this study

Based on this design, the interviews were conducted in 2005-2006. The interviews began with the question, “How did you come to be engaged with environmental education?” The initial round of interviews was unstructured, with the purpose of generating rich stories and reflective thoughts. As some interests and foci emerged through reflections on previous interviews, the second round of follow-up interviews was more focused and sought to form a complementary whole, in pursuit of deeper understanding about the person’s life context (see Table 4-2). While at the beginning, teachers were not confident about what to say about their experiences, or whether what they had to say was ‘worthwhile’, my role was to convince the teachers by making clear the purpose of the interview as being about generating and gathering teachers’ own stories and making them heard through the research process, to facilitate the dialogue.

The eleven participants came about as a result of personal contact. Primarily, contact came from my colleagues on the graduate programme in my previous university (Seoul National University) who introduced me to their teacher colleagues. Also, there was also a list of teachers who were affiliated in the environmental education teacher group that I gained from one academic in this field. In the case of Environment teachers, I became acquainted a group of them with during their study trip to the UK in 2005. I invited them and their colleagues to the focus group interview in 2006 (More details about interview context will be provided in 6.2.3). In terms of a ‘sampling’ strategy, this amounts to a ‘snowballing’ approach pursued together with convenience and accessibility. Due to my geographic circumstances (primarily located in the UK), all the first invitations were made via emails. Through 3 or 4 rounds of emailing before the first interview, I was able to identify each teacher’s main interests and activities in environmental education in order to tailor interview questions in ways that would facilitate and address each teacher’s personal

experiences and issues. All interviews were recorded and later transcribed. Eventually, eleven secondary school teachers' narratives were produced, each containing various sources of information about personal environmental knowledge and values, and environmental education approaches (see Table 4-1). Thus, this process of searching for the teachers who teachers think, and the researcher sees, as doing 'environmental education', was primarily designed to sensitise and identify me to that which is considered to be environmental education and who is deemed to be an environmental education teacher in the current Korean cultural and educational context.

Table 4-1 Teacher Profiles

Name (Gender, Teaching years)	Subject	Main areas of interest	Affiliation	Interview
Han (Female, 15yrs)	Science/earth science	Alternative energy, value issues in science, NGO activities	Korean Teachers & Educational Workers' Union Teacher's STS Group, Centre for Energy Alternative	First/second (June 2005), third (January 2006)
Lee (Male, 11yrs)	Science/biology	'Wellbeing' and health, ecological thinking	Korean Teachers & Educational Workers' Union, Korean Teacher's Organization For Ecological Education And Activity	First/second (June 2005), third (January 2006)
June (Female, 14yrs)	Science/physics	Issue-based science teaching, 'well-being' and health	N/A	First/second (January, 2006)
Kim (Male, 16yrs)	Science/earth science	Issue-based science teaching, green education philosophy	Korean Teacher's Organization For Ecological Education And Activity	First/second (January 2006)
Young (Female, 6rs)	Science/biology	value issues in science	Teachers' STS Group	First (January 2006)
Min (Male, 17yrs)	Art	Outdoor education, art-based ecological curriculum, ecological thinking	Korean Teachers & Educational Workers' Union, Korean Teacher's Organization For Ecological Education And Activity	First (January 2006)

Hong (Male, 24yrs)	History	Outdoor education, NGO activities	Korea Youth Union	First (January 2006)
Nam (Male, 3yrs)	Environment	General issues in environmental education	Korean Environmental Education Teachers' Group	Focus group interview (January 2006)
Sue (Female, 2yrs)	Environment	General issues in environmental education	Korean Environmental Education Teachers' Group	Focus group interview (January 2006)
Hee (Female, 2yrs)	Environment	General issues in environmental education	Korean Environmental Education Teachers' Group	Focus group interview (January 2006)
Yun (Female, 2yrs)	Environment	General issues in environmental education	Korean Environmental Education Teachers' Group	Focus group interview (January 2006)

Although replication of the research design is not expected with this study as is typical in the case of qualitative studies as opposed to quantitative ones (Bryman, 2004, p.273), it is important to address how this specific research design, in terms of sampling and interview method, both shaped and constrained the way in which understandings and analyses were generated.

Firstly, with a small-scale design, the study had the clear aim of using interviewing as the main method for investigating an individual's or group's lived experiences. Because of the research assumptions that teachers' stories about environmental education give voice to "small narratives" about education practice, and that environmental education can be pursued to create cracks and ruptures in school education, teacher participants needed to be chosen carefully in terms of their willingness to relate their personal experiences. In other words, the design should enable inquiries into the potential and limits of teachers' environmental education 'genre' in making changes in school education (see 3.2.2), and this influenced the sampling: teacher participants should be aware, if implicitly, that their environment-related activities are more than what teachers 'have to do'.

Secondly, while the interview method was adopted to elicit and produce teachers' stories, observation of classroom teaching can be a complementary method, especially in developing an analysis of teaching repertoires (Chapter 7). It should be acknowledged that teachers' accounts on their teaching practice could be selective, by relying on memory work, hence limited in showing more holistic view of a classroom scene, e.g. pupils' views and experiences and the gaps between what they do and what they say. However, the study's aim was more concerned with how teachers talk about their experiences, i.e. narrative characteristics, rather than what they experience or what is happening. Also, given the interest in teacher's life experiences, recourse to storytelling was

crucial. A writing task or diary could be a useful tool for looking for traces of teachers' thinking and ways of expressing their thoughts, however, it was beyond my capacity to demand that teachers used such activities. In fact, I invited Environment teachers to following-up sessions during the school holidays. The teachers were positive about the plan in that during the focus group interview they expressed a need for 'collaboration' (see 6.2.3) among themselves and with myself; however, it was not possible to do so given their own schedules and the time limit in my fieldwork trip. Instead, occasional emailing was pursued before and after interviews in order to get the teacher's feedback on the interview experience and encourage further reflection on their thoughts and feelings about environmental education. Thus, I also used the emails as a source of data that facilitated my own thinking and interpretation of teacher narratives (especially in 4.3.1).

Finally, it might be argued that as a small scale, in-depth interview inquiry, it is not suited to addressing matters of the generalisability of teachers' experiences or accounts in 'representing' the phenomena of school environmental education in Korea. To be clear, the study's aims focus on the ways in which teachers' narratives can be used in addressing pedagogical issues concerning the current state of environmental education in Korea and more generally to generate and provide accounts of teachers' experiences that may have been untold or marginalised. Therefore, instead of seeking to claim that the stories told in the study represent how things are in Korea, the inquiry has progressed to explore and develop ways of telling teachers' stories, and thus concern the wider issue of *which stories need to be told, and how*.

In this respect, the development of the inquiry process was deliberately 'purposeful' in the way that teachers' stories were used not only to interpret teachers' ways of thinking and knowing, but also to develop a 'beyond personal narratives' approach as discussed in Chapter 3. In so doing, the characteristics of teacher profiles were further utilised to develop the ways in which eleven teachers' individual and collective narratives could be used for investigating the different foci of the research, and these are described below.

First, given my interest in science education, the selection of school science as the main focus was a strategic decision: to gain a deeper level of knowledge relating to how science teaching can contribute to environmental education (see 2.3.2 and 3.3.3). (In Chapter 5, I introduce five teachers' stories with a focus on teachers' sense-making of their life experiences that motivated them to participate in environmental education. The choice of five science teachers was made based on the variety of the 'plot' that teacher narratives seemed to develop, rather than subject matter).

Meanwhile, interviews with two humanities subject teachers (Art and History) focused on outdoor education and the extent to which their classroom teaching is concerned with environment-related topics. Also, a focus group interview with four Environment subject teachers aimed at building a common understanding of the practices of this new curriculum in schools by sharing their own experiences of university curriculum and teaching. (Chapter 7 introduces teacher narratives in terms of their curriculum practice.)

However, the purpose of the distinction between the two groups: ‘environmentally conscious’ and ‘environment’ teachers, was not concerned with an evaluation of teaching qualities or effectiveness. Instead, three different sections of analysis in Chapter 6, each of which capitalises on this distinction taps into the ‘real’ issues that teachers encountered in the everyday context of their school life, with a focus on their curriculum and pedagogy. The analyses then focus on the ‘institutional’ spaces in which discourses and narratives concerning environmental education teacher identity are produced and lived by both groups of teachers.

One emerging feature was that all but one teacher was involved in more than one teachers’ group such as the Teachers’ Union, science teachers’ study group, and the Environmental Education group, reflecting the practical circumstance that environmental education needs the individual teacher’s own commitments but also a diversity of values and approaches espoused by different groups and individuals. Analyses of the contribution that such learning communities can make are further pursued in Chapter 7, in addressing the teacher’s learning resources or cultural resources that influence their teaching repertoires. Also, although age was not a focus of consideration in this study, given that teachers’ interest in ‘environmental education’ (rather than environmentalism) was often developed after teachers began their teaching careers, interviewing experienced teachers proved effective in eliciting rich stories of their environment-related experiences. This coincides with the fact that their teaching experiences range from 8 to 24 years. Environment teachers were relatively new because of the short history of the curriculum, with 2-3 years working experience at the time of the interviews.

Having recounted some of the characteristics that emerged at the data collection stage, the next section addresses those research perspectives that concern the stories that are told, and how they are told.

4.2. (Re)searching for teachers' stories

Writing this section with the aim of presenting reflective accounts on the process of 'choosing' and 'interpreting' research experiences involved many decisions to be made. Considering that the aim of narrative inquiry is to understand meanings and meaning-making processes and systems, it seems that the focus on 'how' of interpretation prior to 'what' is an imperative for the researcher. Since the other aspect – the 'what', such as six themes in 4.2.1 is still crucial, I included one interview summary in Appendix 4.2.1, to invite readers to further comprehension of the content of teacher stories.

This section is composed of multiple layers of texts that reflect the complexity in the research journey, including research diaries, interview data, ongoing reflections (*italics in the box*), and the main text that wraps up my thinking on interview process as data collection and as informing interpretation. Inside the brackets refers to interviewee's name and code number of interview scripts (e.g. J1: first interview script; F1: focus group interview script).

4.2.1. Weaving 'environmental', 'education', and 'stories'

Having addressed theoretical perspectives and the conceptualisation that gave a form to the interview 'design', the actual process of interview dialogue needs further elaboration. Given that 'procedural' research methods or 'one best way' agendas cannot be insulated from wider research deliberations about epistemology, axiology and methodology (e.g. in adopting a 'cookbook' or 'off-the-shelf' approach to research design), qualitative researchers are encouraged to engage in reflexive activities throughout the whole process (Lather, 1992; Lincoln & Denzin, 2000). They include taking into account researcher-participant relationships in interviewing, for example, by attending to the evidence and effects of performativity in narrative elicitation, and those of tensions between humanist and post-structural perspectives on the subjectivity of data analysis (e.g. through individualism, valorising the reality of personal experience, Sykes, 2001, p.14). It is also important to address Riessman's (2003, p.337) argument, that 'informants' do not reveal an essential self as much as they perform a preferred one in interviews, while Sarangi (2003) reminds us that there is clearly a distinction between interviewing as an instrument and interviewing as a research topic itself. Hence, an interview cannot be taken as automatically 'eliciting' responses on that which the researcher seeks to know, however 'structured' (semi-structured or unstructured) the interview design is.

In developing a narrative-discursive approach to teacher story, this study proceeds on the assumption that interviews should be considered as a “dialogic process” (Mishler, 1999; Riessman, 2003; see also 3.1.2). Besides this process, stories are made and remade through the interpretation processes in which theoretical concerns and priorities in the research agenda play a key role. As a consequence, an outcome of the study will present a highly constructed text, - a “particular story of the polyphonic versions of the possible constructions or presentations of people’s selves and lives” (Lieblich, Tuval-Mashiach, & Zilber, 1998, p.8). It seems to me that learning to engage in dialogue means developing sensitivity and ‘literacy’ that are required for considering language as constitutive of knowledge and consciousness. In other words, as perspectives from literary theory since Bakhtin and Barthes denotes, narrative inquirers need to seek the plurality of language, concerning not only meaning itself, but also signifying process (Webster, 1996, p.42). With this in mind, the continuing and next section describes my attempts to tell ‘our’ stories that evolved and were framed in and through interaction during and after interviews, - the particular stories we chose to tell¹⁸.

Given the research interest in teachers’ interpretations of their own experiences of environmental education, and the nature of narrative inquiry that stresses storytelling as an important part of meaning-construction processes, interviews must be conducted in ways that enable a researcher and teachers themselves to sensitise ways of getting at teacher’s thinking – their beliefs, values, and tacit knowledge. Having struggled myself in the process, I cannot help but agree with Hart’s (1996, p.63) reflection that “our struggle is to discover new methods, to help us find our way through the tangle of human thought to the “drivers” that govern our actions”. Also, as the review of different forms of narrative inquires into teacher’s thinking and practice suggests (see 3.2), representing teachers, their experiences and thoughts with their ‘voices’ posits a demanding role for the researcher.

¹⁸ I mean ‘choose’ in the sense that stories are inter-subjectively constructed.

I realised that my motivation for doctoral study resembled so much the conversation we had during the interview that revolved around why we are doing what we are doing. Now I understand, if partially, why teachers showed unconvinced, confused feelings in telling their experiences. I should be aware that people's experiences and their stories are not necessarily congruent, therefore my role as an interviewer: to encourage teachers to feel free in talking about their experiences in a genuine and honest way, as well as to keep in mind the omission, fragmentation, and emphasis in storytelling. But teachers sometimes stopped and asked me, "Am I talking the right things that you want to know?", or "Having told this much, it is not probably in your interest? So, what do you want to know?" Then, I just comforted them by saying, "It is fine. Let's carry on talking a bit more about it."

(Research diary: October, 2007)

The conversation method (Elbaz, 1991; Hart, 1996; see also p.74) helped teachers and the researcher work together to construct and re-story meanings of 'environment-related experiences'. In the interview, my role was to encourage teachers' thinking process so that they could gradually begin to search for some aspects of meaningful experiences, incidents, and memories, backwards and forwards, and to make links between thoughts and experiences in ways that shaped the meanings of environmental education. I often asked questions and added comments on their views in a polite way, hoping that they would begin to engage in reflective thinking. In so doing, my intention was to engage in more collaborative meaning-making processes.

I found myself mindlessly searching for relevant literature, theories, the papers I wrote before, at the same time jogging through my memories of interview which were already distant. However, it is just so hard to make a bridge between them. Indeed, what shall I tell about my interview experiences? I used to ask myself, "How much do I know about these teachers?" I am only a stranger to them. And this is my storying their stories [...] But now my purpose is, rather than to push hard to 'discover' new meanings, to re-write 'our stories' of interview experience that resonated with both teachers and myself, with focus on inter-subjectivity that formed the fabrics of conversation. (Research diary: 10 July 2007)

One teacher was describing her teaching approach to controversial issues, and then asked me out of blue: "Why don't you research about this issue, rather than doing interview study?" I understood her feelings of constraints and lack of confidence as she found challenging to stimulate pupils to engage in inquiry-based environmental learning. A similar point has been made by Hart: "My

experience with interviews was that most teachers are busy people who are more interested in knowing about new materials and ideas than in writing about their experiences and personal practical theories” (Hart, 1996, p.75). Indeed, it was an awkward situation. But there was a joyful moment as well when one Environment teacher emailed me after focus group interview, saying how much it meant to him to have a great opportunity for talking about his teaching experience with other fellow teachers (cp. Atkinson, 20002).

Our conversation touched upon various elements of life story in that interviews were driven by naturally occurring talk and discussion encompassing teachers’ life experiences and self-awareness on their personal and professional growth, rather than by the particular concepts and perspectives. The primary interest was that life story orients research towards a “person-centred view” (Atkinson, 2002, p.124), in the sense that it goes deep into people’s consciousness; in this study, how a teacher’s personal meanings of environment-related experiences are integrated into their thoughts and beliefs about self: as a person, teacher, environmentalist, citizen, parent, etc.

Our conversation began with my question of “How did you come to be engaged in environmental education?” Since the answer cannot be pinned down, I took this as initiating teachers’ reflective thinking on tacit beliefs and assumptions that underpin their environment-related activities in schools:

“I wanted to start the second round of my life!” (June, J1)

Not all teachers could articulate their ‘reason’ for participating in environmental education as June did. To be more accurate, it was about why she decided to study at the Master’s programme on environmental education. But she had a clear vision of what she wants to do that was developed through science teaching experiences. In contrast, Young seemed more cautious, but she also envisaged what her teaching would be like.

“One thing I really wish to develop for my teaching is critical insight, so that I can teach things from various perspectives, if not eloquently. Then I can tell pupils such stories like, science-related issue can be viewed from this angle, but also can be viewed differently from another angle. I wish to study more, read books so as to be able to do media analysis, for example. So, when pupils recall me, they can think of me as, “This teacher taught us something different”, rather than just a biology subject teacher.” (Young, Y1)

While generation of a whole life story or life history was not the main purpose of interview, teachers' life stories included particular themes of everyday life context and past experiences within the relevant cultural, social, and environmental contexts. 'Significant life experiences' were then noted as teachers recalled some critical incidents and special memories, not only in terms of their influences on teachers' environmental views and activism, but also concerning building (however tentative) coherent meanings of personal histories by making connections between the narrative threads of past-present-future. Distinctively, if compared to Canadian teachers in Hart's (2003) study (see p.107), in mentioning the 'influences' on their environmental dispositions and values, there was a stark absence on 'parental influences' in terms of childhood environmental experiences. Perhaps this might be understood in terms of the tendency in teachers' associations of the idea of 'environmentalism' with the social movement that emerged in Korea in the late 80s (see Appendix 2.1) within the context of a dramatic change to democracy. Indeed, teachers who experienced street demonstrations as everyday events during their university studies tended to associate their environmental activism with those political experiences, but not in terms of any linear links, but through reflective memory work. Similarly, in Kim's (2007) narrative research, the political situation in the 80s-90s was often addressed as the key event, e.g. "University students felt obligated to participate in (social) movements in those days." (ibid., p.149), in the participants' retrospective storytelling of their life experiences.

Not only future-oriented perspectives of meanings of teaching were observed but also revisit to past life experiences in search for significance on current thinking were encouraged:

"I don't have too many special memories about my childhood and school days. I can only recall students in those days were forced to sit and study day and night. As if nothing was more important, and as if no anxiety about life issues beyond it existed." (Lee, L3)

"In those days when student movement was powerful, individual difference was still apparent in the spectrum of participation and political ideologies. In fact, I didn't feel belonging to any of the extreme poles. As I deepen my thoughts through a good amount of reading on ecologism, now I can figure out why I was reluctant to be deeply involved in radical actions at that time". (Kim, K2)

While political activism was one of major narrative 'resources' for some teachers to continue to seek personal identities and develop environmental identities, teachers' self identity descriptions tend to be an admixture of a broad range of values, dispositions, opportunities, and experiences within an array of personal, environmental and professional contexts. Each teacher's story had distinctive narrative qualities, in ways that represent various ways of telling one's life experiences

by keeping a holistic sense of self-understandings, teaching experiences, and life. For instance, the stories of Min, the experienced Art teacher, could be read as a short autobiography that vividly depicts different episodes in different schools that form his history of environmental education (see 6.2.2 & 7.2). His stories also contained cultural historical ‘scenes’ of the different geographical characteristics of the places he worked, such as an island, rural area, and industrialised area, as observed and documented through his eyes as a teacher.

Except for a few Environment teachers, teachers were senior to me. In our culture, it means a change of ‘language’ to show respect. But it also means I became rather a listener when it comes to their past experiences which I never experienced. The 80s cultural experience of dramatic breakthrough to a democratic state was a prime example of this. Most of the senior teachers experienced this change when they were university students. To some teachers, it seemed to be an absolutely life changing memory that probably was influential on their activist identity. To others, it was still a powerful context that enabled the consequent burgeoning of social movements, including environmental movement. I noted that even after twenty years, people still read and re-read this ‘text’ in their life contexts. As part of a younger generation, I used to hear about different versions of a story from seniors at university and the media. But then what does it mean to them now, when talking about environmental education? (Research diary: July, 2007)

Understanding teacher stories in such a holistic way, the difficulties of clarifying one’s own values and beliefs were often observed. When it came to environmental and sustainability issues, teachers were more concerned about teaching and learning about them, beyond advocacy of certain views. It was also obvious that teachers’ perspectives were varied and even conflicting one another. The endeavour became that of grasping hidden assumptions concerning the relationship between personal views and perspectives on the environment, and educational causes and views in adopting moral and ethical responsibilities for the environment.

In thinking about their plans and vision of teaching career, diverse perspectives of the environment and education were evident. Teachers often found difficulties in articulating their environmental beliefs and values. Like Kim and Han (below), teachers’ narratives were constructed with the intention of weaving often missing linkages between beliefs and action, and theories and practices:

“Since I am a teacher, my teaching practice must substantiate this idea after all. It certainly takes a good deal of effort to be able to have confidence. Ten books might end up with just one idea for teaching. It is a long and slow process.” (Kim, K1)

“Did I think it was a progressive idea or an absolutely vital thing to do? Well, anyway, I believe it led me to realise there is some degree of room in which I can teach something different.” (Han, H2)

This reflective context helped me understand the ways in which teachers construct distinct meanings of a teaching self in relation to an ongoing dialectic relationship among personal, environmental, social, and professional identities (see 3.3.2). The recognition of the teacher’s tone of voice was crucial for capturing dilemmas and tensions that surfaced in such a way that contested sites of meaning-construction could be disclosed. Here, contemporary ‘issues’ related to the environment, education and environmental education that teachers addressed, or that I asked teachers to speak about, became important ‘contexts’ for exploring the sources of personal and cultural learning that constituted their environmental values and knowledge, and teachers’ decision to address environment-related issues.

As teachers’ reflective narration developed, their dilemmas indicated complexities and contradictions in the constitution of educational practices in ways that further revealed multi-layers of personal, pedagogic, institutional, socio-political, and discursive meaning-making systems:

“Even though I try to approach environmental issues from the so called Two Hats perspectives, it doesn’t work like that from pupils’ perspectives. At the stage of the final decision making after all these processes of a debate, pupils seem to try to read my face as if I have my own preference. Then they say, “I know you are giving me a bad score if I vote for the ‘development’ side!” ((All laugh)) I mean, pupils already see me as an environmentalist even though I try to remain impartial. It seems that more considerations are needed.” (Yun, F1)

“I am not a radical activist or something. On some issues, I am confused to take my position. I believe environmentalism is not a religious faith. There aren’t things that are right and last forever. We need to attempt to know what the best thing to do is, in order to reach a rational decision now. We have to respect different points of view, and listen to them. Some teachers would be too impatient to make change happen. I would say to them, “Make every effort to move people’s minds, and don’t be so anxious about changes. Looking back, I was blessed to have such valuable experiences.” (Min, M1)

Whilst the role ‘cultural resources’ in teachers’ stories in terms of teachers’ taking up or resisting prevailing or available cultural narratives of ‘environmental’ ‘issues’ will be further explored in the

next section, here I focus on how such stories and teachers' sense-making of them guided reflections on the role of education and, in particular, the teacher's role in society. Indeed, teachers' passion for and commitments in environmentalism in their own ways needed further sense-making processes of what they can do in schools, and how. Recounting their actual teaching experiences entailed drawing on the threads of everyday school experiences including informal talks with other teacher colleagues, very concrete episodes about pupils' behaviour, pressure on pupils' academic achievement, current educational policy issues, etc. In Environment teachers' stories, teachers' struggles to 'survive' (see 6.2.3) were vividly depicted with their voice tones being weary rather than self-confident, illustrating the more challenging conditions for implementing low status environmental subjects, than subject-based environmental education.

I wonder whether there can be such an independent area as the 'environment'. I doubt it. [...] It (Environment subject) is simply about ethics. More than anything else, it is not one of the core subjects. Pupils simply dismiss it. (June, J1)

Teachers tend to expect that we have some kind of expert knowledge. Although we want to think about the environment beyond our profession, others don't see us in this way. Their expectation is... "Since you majored in environmental education, you should be able to talk in depth about the environment." However, in my mind, I feel I should learn from them. [...] I just hope teachers don't see us as if we are so different. I think we are in the same place in the sense that we all try to take the environment into consideration, to think beyond science and (dominant) social values, as well as we haven't got any absolute answers but we try to work out what should be done. (Nam, F1)

With ongoing reflection on the dynamically constituted interview situation on the one hand, my preliminary thinking and reading of interview texts identified six themes as story elements, on the other (Table 4-2), I saw these themes as generating constellations of different but inter-related layers and contexts of narratives through which meanings are constructed and negotiated, and as a lens to read interview texts, as well as a tool for facilitating conversations. In this way, we began to constitute conversational realities and ascribe meanings to lives, by explicating narrative ways of knowing and constructions of meaning. As the word 'dialogue' implies, the process was driven by different modes of interaction between and among teachers and the researcher herself, involving rich feelings and diverse discursive features such as sympathy, argumentation, confession, and so forth.

Table 4-2 Six themes of teacher narratives

Themes	Associated meanings	Key elements and narrative styles
Motivation and commitment:	Frequently associated with 'progressive', 'looking-ahead' attitude toward personal and/or professional goal	'compass', 'guide', 'taste'; Critical incidents, significant people
Perspectives on the environment:	Hard to pin down as pre-existing categories (e.g. eco-centrism), as always re-interpreted in relation to personal experiences, dispositions, and opportunities	Childhood memories, nature experience, hobby, cultural and social phenomena (e.g. 'well-being' fever), NGO experience
Teacher's work and role:	Social (public) responsibility, institutional roles and constraints, consciousness and vision	Argument, conviction, ambivalence, struggle; Preferred teaching and learning approaches, curriculum development experience, collaboration with other teachers
Consideration of pupils:	Social imperative for pupil's learning, teaching methodology, youth culture	Episodes and memories of some pupils, pupils' responses on teaching
Critical stance toward 'Environmental Education':	Structural constraints, 'trendiness' or popular slogan	Critical voice; Relationship between EE and their teaching, knowledge about EE
Self-reflection and learning:	Change, transformation, self-understandings	Narrative (dis)continuity, sources of learning

4.2.2. Reading cultural histories through personal narratives

Cronon, an environmental historian, questions how historians can tell good stories about environmental changes and human interactions with the environment and nature, given the power and limit of narratives that are time and culture bound, and therefore convey particular plots of stories while silencing on others:

A powerful narrative reconstructs common sense to make the contingent seem determined and the artificial seem natural. If this is true, then narrative poses particularly difficult problems for environmental historians, for whom the boundary between the artificial and the natural is the very thing we most wish to study. (Cronon, 1992, p.1350)

In a similar vein, the perspective of culture as providing interpretive repertoires or models of action by impinging on the way in which perceptions and knowledge about 'environment' are constructed

(see 3.3.3) also leads to questions about the role of educational stories as to whether education produces (more than) cultural meanings, i.e. through critical ‘literacy’. With this in mind, my interest in reading cultural histories through teachers’ personal narratives, based on these theoretical concerns, lay in understanding how teachers (individually or collectively) take up cultural resources in telling their personal histories, by weaving together multiple elements of ‘environmental’, ‘teaching’, ‘learning’, and ‘life experiences’.

In so doing, like the anthropologist who uses life stories to gather and explore shared cultural meanings from the insider’s view of a community, being an expatriate myself became a (both unexpected and planned) opportunity for seeing Korean culture from a fresh angle with a reflective attitude, i.e. I had dual researcher identities: an insider and outsider. Coffey (1999) provides useful insights into the ‘ethnographic self’ as the outcome of complex negotiations. Indeed, the anthropologist’s tenet of “making the strange familiar and the familiar strange” was the very perspective that was necessary for me to participate in meaning-making processes in a more collaborative way, and to rewrite the cultural historical narratives that may influence teachers’ thinking and practice in environmental education. In the following, I reconstruct my cultural experience in terms of three key ‘cultural events’ that offered opportunities for reflectively thinking about how stories about education are often told with/in the cultural narratives. (Tales of environmental issues are usually ‘topical’, but in fact, they are composed of cultural, historical, and political constructions. In this sense, for more understandings about three issues in the contemporary Korean context, see Appendix 4.2.3 from which excerpts shown here are drawn.)

❖ *‘Well-being’ fever*

“Live Cool and Well” ... Is it a New Culture or Just a Business?

To define “well-being” with trendy words, we can say a ‘cool’ healthy culture.

Generally, well-being is known as a culture pursuing a healthy life through harmonizing the mind and body and not being tied down to materialistic values. Not to mention, it is regarded as an elegant sense of taste or a symbol of wealth. [...]

Source: *Donga-ilbo*, 11 January 2004

The idea(l)s of ‘ethical consumerism’ and ‘fair trade’ that have gained currency in this country were unfamiliar to me. I used to read The Guardian newspaper’s section that covers sustainable

lifestyles. While ‘well-being’ fever in Korea - the English term is widely used in Korea - seems equivalent to these, what seemed missing to me was to think beyond caring about individuals’ health, toward addressing global issues such as sustainable development in developing countries. Indeed, my observation on the well-being phenomenon in Korea was that health and environmental issues were driven by commercial trends and strategies, with a societal move towards new consumer activism being omitted. I used to express my experience and observation such as this during interviews, as well-being and health seemed topical in teachers’ environmental education.

Lee was particularly interested in food and health issues. He was able to express his concerns about the difficulties in sustaining a consumer movement in Korea, by illustrating stories about a small food-related organisation. Lee was a rather modest person who would never ‘talk up’; however, I could feel his passion and commitments. It was interesting to compare this with his stories about teaching in which he was positioned as less active and agentic. Other teachers expressed similar concerns about the ‘well-being fever’, especially when the images and messages of the media distort actual and more important issues about the environment and sustainability. For June, education should engage pupils in seeing the truth beyond superficial understanding, and her teaching approach that combines pupils’ scientific inquiry with critical literacy illustrates the ways in which learning about the phenomena of ‘well-being’ itself can take place:

‘Well-being’ is becoming a popular trend today, so when an advertisement says, “This is good for health”, then people would just buy it without suspicions. But pupils should be able to question, for example, “Why is it good?” (June, J1)

❖ *Ecological restoration*

By the autumn of 2005, Seoul was showing off a new landmark in the city. The ‘ecological restoration project’ on the area of Cheonggye stream that flows through central Seoul was an ambitious project led by the local government of Seoul, and it provoked severe criticism and resistance as much as it promised due to the top-down approach to decision-making processes and the lack of ecological consideration in planning, to name but a few issues.

The capping of the Cheonggye Stream and the elevated highway were symbols of predatory modernization, which strove for only competition, speed and efficiency. The clothes factories that were in its shadow were symbols of its values, namely the trampling of human rights, justice, culture and nature in the name of economic efficiency. Now with the restoration of the Cheonggye Stream the forgotten history of life has been revived and those friends of ours in nature that were forced out have returned. The restoration of the stream has become an opportunity to do away with the sorcery of predatory modernization and take another look at the value of life.

Extracted from [Editorial] Virtues and Flaws of New Cheonggye Stream, *The Hankyoreh*, 1 October 2005.

When I was conducting the second round of interviews in January 2006, ‘Cheonggyecheon’ (Cheonggye stream) had already become a popular place, attracting thousands of visitors everyday in the severe cold weather. It seemed natural to link this new cultural landmark to interview questions in order to understand how teachers perceive contemporary environmental issues. For me, the Cheonggyecheon project as policy seemed to represent very ‘Korean’ characteristics, in that discourses of efficiency and economic wealth overwhelmed any other voices, as the case of Saemangeum reclamation project – the biggest national development project that brought about severe resistance from environmentalist groups has been a key site of public controversy¹⁹. (In fact, the case has been taught in schools, as teachers in the study often addressed their teaching experiences about it. I will discuss the limits in teaching contemporary issues such as this in Chapter 7). I used to wonder what if an ‘outdoor education programme’ were run in the Cheonggyecheon area in the name of nurturing sensitivity about nature. By November 2007, it turns out that ‘ecological learning programme’ has been run for general public and schools²⁰.

Although all teachers did not share these critical perspectives, some did express their concerns rather than excitement in regard to the symbolic representation of ‘ecological’ ‘restoration’ that Cheonggyecheon stands for. June dismissed it as ‘artificial pond’ while Lee put it cautiously, “It looks nice, but that’s it.”

¹⁹ A brief account: “As one of the five biggest tidal flats in the world, preservation of the Saemangeum area has become a concern that extends beyond the borders of Korea. Over 50% of birds migrating between New Zealand and Siberia are estimated to rest at the tidal flat. The area is located along the south-western shore of the Korean peninsula in the North Cholla Province. It is the main livelihood for most of the surrounding fishing community. Housing more than 300 types of aquatic and plant species, the tidal flat is also an integral piece of the regional ecosystem.”

(Source: <http://www.greenkorea.org>)

²⁰ Source: <http://cheonggye.seoul.go.kr> (accessed 15 May 2008)



Figure 4-1 The Cheonggyecheon at night

(Source: http://en.wikipedia.org/wiki/Image:Seoul_Cheonggyecheon_night.jpg, accessed 15 May 2008)

❖ *Stem cell research scandal*

At that time, Korea also faced another dramatic situation that put the nation into turmoil. The internationally recognised stem cell research scandal on human embryo cloning that was carried out by the first ‘Supreme Scientist’ Dr. Hwang and his team turned out to be fabricated. When the story broke, it was covered widely in the Korean media. Being an expatriate myself, I remember that I could not leave the Internet, checking every detail of the facts and rumours around it.

It would have been odd if this issue did not come up during the interviews because these teachers, especially science teachers, showed genuine concern about values and ethical issues produced by the unpredictability of science research in the previous interviews. I found teachers, to varying degrees, engaging with this issue in their teaching context. The general ethos was frustration and anger about the lack of collective capacity for responding to the issue. We desperately felt something had to be done²¹. Han, as an experienced teacher who are leading a teachers’ STS group

²¹ I took personal action too. In Britain, academic efforts had gathered since the disastrous BSE (Bovine Spongiform Encephalopathy or mad cow disease, first recognised in the UK in 1986) disease, which helped me develop a theoretical piece about how science education can benefit from science studies to address uncertainty and risk issues (Hwang, 2006).

was able to elaborate what she had been doing to address ethical issues that Hwang's research entailed even before the scandal came into light. However, in the dramatic situation where the truth was silenced by the prevailing voices of scientific heroism and nationalism, teachers found they were very isolated if they acted in teaching about the issue, and even speaking about it in the school meant facing criticisms from other teachers or pupils.

SCANDAL TIMELINE

Feb 2004 Hwang Woo-suk's team declare they have created 30 cloned human embryos and extracted stem cells

May 2005 Team says it has made stem cell lines from skin cells of 11 people

Nov 2005 Hwang apologises for using eggs from his own researchers

15 Dec 2005 A colleague claims stem cell research was faked

23 Dec 2005 Academic panel finds results of May 2005 research were fabricated

10 Jan 2006 Panel finds 2004 work was also faked

Source: *BBC NEWS*, 13 January 2006 (<http://news.bbc.co.uk/go/pr/fr/-/1/hi/world/asia-pacific/4608838.stm>, accessed 15 May 2008)

"A great Korean achievement" (*JoongAng Ilbo*, 13 February 2004)

"Koreans open the way in organ cloning" (*JoongAng Ilbo*, 12 February 2004)

"Seoul national geneticists lead advance" (*JoongAng Daily*, 12 February 2004)

Source: "Examples of headlines foregrounding Hwang's breakthrough as a specifically Korean achievement" (Chegar & Kitchinger, 2007, p.293, Figure 1)

"Burgeoning stem cell dispute: nation's global credibility severely eroded" (*Korea Times*, 16 December 2005)

"Hwang crucial for Korean's image" (*Korea Times*, 16 December 2005)

"'There are no stem cells'. Nation's global credibility is in danger" (*Hankyoreh*, 16 December 2005)

Source: Examples of headlines foregrounding the Hwang's scandal as a threat to South Korea's reputation (ibid., p.300, Figure 2)

What are implications of the scandal for education? While biotechnology issues and research ethics issues can be easily regarded as subject matter, the aftermath of the 'scandal' seems to require a much wider range and depth of societal reflexivity and learning processes regarding what science

and scientific knowledge are for, as already pointed out by many commentators from different social sectors and perspectives (e.g. Kang, Kim & Han, 2006; Kim, G., 2007).

To conclude this section, these cultural experiences during the fieldwork - the issues themselves, and the ways in which those issues were addressed during the interviews - were influential in many ways and at different phases of inquiry. As I worked with eleven teachers who had unique experiences and personalities, every interview reflected different personal, cultural and situational themes in the perceptions of the 'environment' and 'environmental education'. These contemporary issues became an interesting, unexpected site where teachers' perspectives and values might be differentiated. Indeed, some teachers' voices seemed more critical and radical than others. Also, the three issues were not equally relevant to teachers' environmental education. While the 'well-being' issue seems easily integrated with teachers' teaching approaches, the 'Cheonggyecheon' issue has not yet been introduced into teaching. Meanwhile addressing the stem-cell research issue as part of their stories about teaching seemed even unexpected to some teachers, except the science teachers. In spite of different manners in which teachers recognised and read cultural narratives, reading cultural histories through personal narratives in this section aims to address: i) the importance of recognising some cultural aspects in teachers' stories about environmental education, in that, ii) constructions of 'environmental' 'issues' reflect dynamic cultural processes (which will be further discussed in Chapter 7), by developing ideas about the role of cultural narratives in teachers' curriculum repertoire-making processes.

4.3. Issues of representation and quality

4.3.1. Reflexivity in interview and interpretation process

Concepts related to reliability and validity are used as important criteria in establishing and assessing the quality of quantitative research. But it is a general recognition that the application of such criteria for qualitative research in the same way is not desirable, given varied perspectives as to what extent or how quality of qualitative research can be judged (Bryman, 2004, p.277), or the question as to whether it is possible to have a set of comprehensive, standardised criteria (Hatch & Wisniewski, 1995; the 'guideline' debate in environmental education, *Environmental Education Research*, 2000, vol. 6 (1)). Many proponents of narrative inquiry have attempted to conceptualise the qualities to be expected of story research (Bruner, 1986; Polkinghorne, 1988; Connelly & Clandinin, 1990). In this study, while the perspective of narrative as constituting realities, not reflective of the reality (see 3.1.2), meant a move beyond empiricist or positivist concerns with

facticity, it does need to address questions of the complexities and politics implicated in meaning-construction processes, especially in order to transcend the dualistic view that qualitative research is value-laden and subjective, and therefore not valid (Greenbank, 2003). It was in this imperative that the writing of the interview and interpretation process in this chapter has sought to demonstrate reflexivity at different stages of inquiry, by engaging in the fundamental question - what kinds of 'truths' does narrative inquiry aim to pursue, explore, or establish?

By recounting my own experience as a researcher/interviewer and the process in which teacher narratives were reconstructed intersubjectively and informed by theoretical perspectives throughout this chapter, I have sought to locate myself as an 'author' of the story – and primarily, the story of this research. Providing that the inquiry process was 'purposeful' in ways that shaped what kind of stories we (the researcher and teachers) wanted/needed to tell, by considering how they are meaningful to teachers as well as generating knowledge and perspectives that invite readers to share, the most important criterion of narrative inquiry should be related to answering the question of how readers come to believe the stories as they are narrated; that is 'credibility' (Guba & Lincoln, 1994) or 'believability' (Blumenfeld-Jones, 1995). Concerning this, Blumenfeld-Jones (1995) proposes a concept of 'fidelity': "an obligation towards preserving the bonds between the teller and receiver" (ibid., p.28) as crucial to fulfilling the researcher's role as author/writer. Fidelity is about being honest and true to storytellers and to the context of narrative in reconstructing storytellers' narratives. My stories in 4.2.1 and 4.2.2 were the very attempt to engage with these two aspects of fidelity, by clarifying issues and dilemmas that shaped inquiry methods in ways that stress (not just what) how stories are told through more reflective and collaborative interactions and cultural perspectives. However, more reflective accounts on the ways in which I structured teacher narratives through selecting, prioritising, framing, theorising, etc. are required to legitimise the analysis methods as one unique, possible way of telling teacher narratives, e.g. by considering the 'genres' of inquiry (Hart, 2000; see Chapter 5).

To begin with, in spite of my best efforts to explicate how 'particular' stories are being told (through accounting for the interview designing/sampling process in 4.1.2 & 4.2), it is still fair to ask, "What are the missed opportunities by doing so?" A 'gender' perspective in environmental education was one such case (e.g. Gough & Whitehouse, 2003). With a mixed gender group of teachers, I might be able to explore whether a teacher's gender influenced their perspectives of (environmental) education, or how everyday life experiences are interpreted through gendered frames. Han's vivid accounts on her experience of using handmade cotton sanitary towels were then not only an example of women's embodied experiences, but also seemed to suggest the ways in which issues related to women's body are silenced in everyday school lives:

(In responding to my comment on her passion and commitment) Well, I am not sure, but it is true that I want to do something meaningful. For example, there was an alternative sanitary towel initiative by Blood Sisters (eco-feminist group). I thought it would be a good idea if some teachers, including male teachers get together to learn about how to sew it. But in the end, it didn't happen like that. Instead, I bought some to show teachers, and tried hard to persuade them to get interested in the idea. [...] I tried them for myself, and it was good and comfortable. [...] (Han, H3)

Alongside the gender issue, teachers' embodied experiences related to parenting and health could enable stories to become more politicised in representing a teacher's being/becoming, through vivid accounts of personal politics such as consumerism and environmental action. Instead, my reconstruction of teachers' life stories in Chapter 5 focuses on understanding the teachers' sense of vision in terms of its formative narrative characteristics such as 'plot' and 'metaphor', rather than on illuminating teacher's embodied knowledge and vivity of individuals' life experiences that are more directed toward phenomenological inquiries.

However, addressing the cost of making choices in representation does not take us to the direction of a claim that 'inclusivity' of topics and experiences is the key to the quality of representation. Rather, it is to acknowledge that representing is a selection and enactment of a researcher's theoretical positions and these shape particular ways of telling the stories. Indeed, a growing sense of "conscious subjectivity" (Klein, 1979, cited in Casey, 1995, p.232) in becoming a narrative inquirer meant interrogating my own assumptions and values, and the theoretical knowledge and research goals that provided particular kinds of lenses in the interpretation process. To make the idea explicit, throughout the whole research process, my epistemological and methodological interest have been more concerned with *how stories are lived through* within the intersubjective field and temporal horizon of the inquiry context than taking particular theoretical perspectives and agendas even before interpretation starts (see also 3.1.2).

My perspectives and strategies in engaging in reflexive research processes can be further explicated in terms of 'participatory' inquiry: participation meant to me making sense of multiple researcher selves in constructing narrative realities through dialogue-based interviews and a critical stance toward theoretical frames and teachers' stories themselves, rather than objectivity *per se* as often suggested in critical lines of research. In the recent debate on 'post-informed' research inquiries in the environmental education research field (*Environmental Education Research*, 2005, 11 (4)), McKenzie (2005) also called for participatory inquiry as an ethical approach to research. From the standpoint informed by post-structural feminism, she suggests different criteria for assessing

‘validity’ in research, including Lather’s (1991) idea of ‘catalytic validity’, that is, it is concerned with:

... the degree to which the research process re-orient, focuses and energizes participants towards knowing reality in order to transform it, a process Freire (1973) called conscientization. (Lather, 1991, p.68, cited in McKenzie, 2005, pp.406-407)

It is also suggested that both researcher and researched work together in creating vision and imagination for “what could be” (Fine, Weis, Weseen & Wong, 2000, p.122, cited in McKenzie, 2005, p.409). From this perspective of ‘research as praxis’ (Lather, 1991), collaborative or participatory research seems to be crucial in the ‘practice’ of education, and perhaps, education as about making change. Embarking on fieldwork, I was also passionate to understand how teachers make changes in their own contexts, especially given the underlying assumptions of ‘environmental education’ (see 3.2.2 and 4.1.1). Thus, it might be an easy option to set out interview processes in ways that investigate ‘critical’ dimensions (Robottom & Hart, 1993) of environment-related activities that teachers engage in, as ways of facilitating changes in pupils’ learning and school praxis. But aside from the research orientation of which the focus lies on understanding, not ‘intervention’, my concern to develop teachers’ ‘stories of change’ (see 3.2.2) through narrative inquiry has involved participating in critical hermeneutic cycles and subsequently, generated multiplicities of meanings. For instance, teachers’ narratives of their action can be characterised through different, or even conflicting ‘storylines’ in which teachers as authors of the story can position their subjectivities in different ways that make stable ‘characterisations’, e.g. as hero, activist, victim etc, problematic. This can lead to further struggles in grasping meanings that often appear through rhetorical features such as an ‘argumentative’ form or expression of ‘ambivalence’ (Chapter 6).

One vignette deserves further attention here. At the stage of reconstructing teacher narratives in short story forms in Chapter 5, I was able to get feedback from Kim on his story, especially on this part:

But I do have a clash with teachers, sometimes. It’s a matter of world-view, in the end. I doubt younger teachers would be different. The current teacher examination system resulted in reward-driven teacher culture. They don’t ponder value issues.

Via email, Kim commented:

[...] This part was cut-down too much and therefore may lead to misunderstandings by British people about *our* teacher culture. I was described as if I was an *eco-warrior*. In fact, there are many *ordinary* teachers who are still very committed. When it comes to value issues, more and more teachers are recently interested in ecological issues, whether they are young or old. But their ways of involving in the issues will be varied, although their thinking might be limited in the capitalist system and it is not easy to think beyond the system in which we live. My understanding of English translation might be wrong. Yet still, we might need to consider better ways... since it is about talking about *other teachers*. [...] (22, March, 2007) (My emphasis)

Then it was followed by some lengthy details about how he thought about better ways of representing the Korean teacher culture in relation to teachers' thinking about ecological issues. In fact, stereotypical images about environmentally committed teachers were often addressed among the teacher participants, in terms of their sense of individuation or shared consciousness among like-minded teachers, which developed into another analysis chapter (Chapter 6). Through the layering of the stories by including the text analysis of media stories, my analysis became centred on posing the question of "Who is an environmental education teacher?", in ways that invited readings of stories from critical perspectives by attending to the extent to which teachers' stories resist 'good/bad/odd' teacher images in school culture in Korea. By doing so, teachers' concerns and dilemmas in environmental education in the institutional context could be re-told in ways that represent the active construction of teachers' voice and professional identities, beyond the languages of 'barriers' and 'gaps'.

Kim's comment was still constructive in affirming that the issue of teacher images was not only the researcher's agenda but also shared by a teacher participant, and I hope reflection also came through on his side. In this way, 'participation' and 'collaboration' meant engaging in a negotiative process of meaning-making with research participants (Casey, 1995, p.232). Atkinson (2002) also notes this point in the context of life story interviews:

What they are getting are the stories respondents want to tell. That in itself tells us a good deal about what we really want to know. (Atkinson, 2002, p.136)

However, this experience of mutual reflection was limited since after the interviews, it may give rise to problems of 'authenticity' from the story-giver's perspective. Larson's (1997) experience of being interviewed for an autobiographical research project is pertinent in taking this issue further. In reading the researcher's version of her life stories, she notes the gaps between the stories that the researcher wanted to analyse and the realities of her own lived experience:

In reading my own stories, I saw that I often glossed over life events as I had experienced them. But this is not the story I wanted to tell. It was the story I could tell given the process we used. This original oral text provided entry into a deeper and more personally authentic life story. That was the story I wanted to tell. The story that tapped into the marrow of my bones. As the story-giver, the process was far more akin to climbing an enormous, old oak tree than to skipping merrily down a long, straight, and neatly paved path. I had to choose from many branches. (Larson, 1997, p.462)

Indeed, teachers might find my version of their life stories less vicarious, more selective, or even glossed-over, albeit my efforts to preserve the value of the fabric of the life stories and paths teachers lived through. However, with this unresolved issue, on the one hand, we might wonder then where to draw the boundary between autobiography (emic accounts) and research (etic accounts) on the other? In this chapter, I have justified my strategy for inquiry and analysis which developed into three themes with mixed-voices as one possibility in narrative inquiries. It was also my own way of engaging with the question of “what matters” in environmental education research for researchers to “engage the socio-historical complexities of the developing stories of change” (O’Donoghue & Lotz-Sisitka, 2005, p.451), in attending genuinely to abstract ideas about reflexivity, with the responsibility on my research project as an ethical engagement with teacher narratives. Thus, readers are invited to engage in this interpretive project by taking on the task of:

Attend(ing) to how stories are told, including how we stage what we represent in the scene of writing and what an analysis makes present via the delineation of weighty tendencies, dominations, the horizon of expectations and how categories construct inclusion/exclusion. (Lather, 1999, p.9, cited in Sykes, 2001, p.16)

4.3.2. Writing as a method of inquiry

Having written a reflective account of the research process, I would argue that the writing process in itself is also a part of research inquiry where thinking comes through (Richardson & St. Pierre, 2005). Indeed, the research process was neither linear nor monological. It includes more than writing ‘analyses’, as it involves the overall textual arrangement and rhetorical strategy in structuring the content and form of the research report in a more persuasive way. Indeed, as a writer/author of the thesis, I often thought that my own storytelling and writing benefitted from learning to become a narrative inquirer throughout the inquiry process. As I saw multivocality and performativity in teachers’ narratives, I noted my voice in the text can be differently located in

different chapters to serve different purposes. As teachers struggled to make sense of their thinking and experiences, I often felt the pressure to weave a coherent story out of entangled threads of thinking and experience that required further searching and delving. I also had to learn how to write more persuasively and reflexively by seeking the congruence or possible compromise between the different research agendas and issues posited by my own interest, theoretical perspectives, and the data.

Writing as a method of inquiry began in the initial stage of data analysis. I wrote some short form of stories in the way that my understanding at the time led to, and 'coding' was used to inform the way I understood the stories from different angles (see Appendix 4.2.2). Through the experimental work of different formats including interview summary (Appendix 4.2.1) and life history (Appendix 4.2.2), I obtained some frames for interpretation, but the frame that privileged my way of seeing and reading had to be challenged through the sequences of the writing experience. The style of writing was reconsidered and changed too. Writing about the fieldwork experience often entailed emotional work through the revival of the vicariousness in dynamic interview situations, with different individuals and groups. But such engrossment might lead to a self-indulgent style of writing as if subjectivity could be totally represented by the means of language, or 'confessional tales' in which cultural knowledge is given legitimatisation through the testimony by researcher's personal accounts (Van Maanen, 1988, p.78). The layering of multiple texts in 4.2.1 and 4.2.2 intended to mobilise different voices that appeared at different stages of inquiry in ways that showed why meanings of 'environmental' 'education' should be located within the layers of stories: personal, individual, collective, and cultural.

Translation of Korean to English was another spur to engaging in a more reflexive textual practice. Among the original interview transcripts and documents, part of the texts were selected in the analysis, and eventually translated into English. Accuracy, or smoothness was improved through proof reading by native speakers, but 'meaning' could never be translated in the original sense. Rather than doing word-by-word translation, I edited texts in the way that they conveyed relevant contexts, considering the voice tones and the speaking styles, such as terms frequently used by individual teachers. I also noticed that the expressions in Korean language were often vague so direct translation would confuse or could lead to total misunderstanding. In this case, the change or addition of words that could better serve the interviewee's intention was inevitable. However, more subtle nuances that conveyed specific cultural knowledge were not easy to translate. Also for the same reason, translating in specific styles, e.g. British English seemed irrelevant. I also got help from two Korean undergraduate students at the University of Bath in comparing samples of original interview texts and translated versions in order to increase the authority of my translation.

But it remains the case that the analyses were based on the original Korean language to lessen the impact of the translation process upon the analysis.

Writing in different contexts was also crucial to increasing my capabilities for critical reflexivity about my doctoral research project (Richardson & St. Pierre, 2005). Participation in an AERA symposium in 2006 on doctoral research in environmental education offered me a good experience in this respect. Through collaborative storytelling and writing about doctoral research students' experiences of their personal and professional journeys with different audiences (Nikel *et al.*, in preparation), we - the students and supervisors - attempted to develop ways of engaging in a constructive dialogue to understand the multiple dimensions of identity development and transformation in ways that challenged conventional assumptions about what is involved in conducting doctoral study. In sharing our personal experiences, I was encouraged to think about my cultural identity in the way that it influenced the way I was conducting the research from the perspective of the meta discourse of academic research, and I wrote:

The fieldwork experience in Korea in the following year offered me an unexpected opportunity to have a fresh look at my research project through conversation with teachers and colleagues. When we spoke about the research topic and design, I was often asked concerning, "Why are you researching about Korea while studying in the UK?" In reply to my request for advice on my research project, one Korean professor made a similar point. It seemed to me that there was a taken-for-granted assumption that an overseas degree means gaining 'newer' or 'advanced' ideas and knowledge, and making them applicable to a Korean context. This is probably what is expected of the role of academics deeply ingrained in our culture. In rethinking the question of 'why' I am doing research, as more than something out of my personal motivation, I began to reflect on prevailing narratives such as this. Indeed, we Koreans, by and large, tend to ascribe the rapid economic and social progress to this "keeping up with' the global, western standard" attitude and the national ethos of 'zeal' that is so ingrained within our culture of education, as recognised in the popular term, 'education fever'. I realised that it is 'ideological' in ways that shape normative thought and practice in defining what good research practice is. I thought I wanted to resist the idea of my purported role as a 'trend-setter'.

My colleague in Korea once asked me whether I developed any alternative agendas in rejecting the traditional role of academics and envisioning my academic career in the future in Korea. While 'vision' is something uncertain that should be pursued in the long term sense beyond PhD process, the question helped me deliberate and spell out the contribution of my doctoral research to the 'field' of research, with respect to ways of conducting research inquiries, in the sense that academic knowledge production is not a culturally-neutral process.

To conclude this section, the auto-ethnographical thinking and writing that I engaged in most notably in this chapter but also throughout the whole research process, have helped me see the meaning of ‘inquiry’ in narrative inquiry as about a more dynamic cycle in which my personal motivation, knowledge interests, and reflexive fieldwork experiences feed into more theoretical and analytic dimension of the research process.

4.4. Developing methods of analysis

4.4.1. Making the cases for three research themes

As indicated in Table 4-2, while narrative themes could be used to inform methods of narrative analysis through making comparisons and contrasts across the individuals’ ‘cases’, the narrative-discursive approach in the study entailed a move away from such a thematic, content analysis toward developing a hermeneutic strategy with regard to these narrative themes as open, ‘sensitizing’ frames. This differentiated the method of data analysis in this study from, say, a conventional ‘grounded theory’ or thematic analysis. Rather, the themes (e.g. contents and forms of stories) can be utilised to critically examine discursive or cultural processes of producing meanings that both enable and constrain individual versions of stories of environmental education.

For educational researchers, teachers’ personal histories offer inquiries a chance to discover and recognise a counter-narrative that has traditionally remained unexplored and untold, but may have a value in critiquing dominant social and educational ‘curriculum stories’ (e.g. Goodson, 1992). Teachers’ personal narratives in this study highlight the ways in which individual teachers take up available cultural resources through personal and cultural learning, and consequently diversify the ‘standard’ range of practices of environmental education (e.g. as defined by theory or policy), through often creative but also controversial teaching approaches, such as teaching values issues through science teaching. Crucially in this process, capturing the characteristics of a plot in terms of dynamics, interactions, flows, or tensions can inform ways of understanding the contexts in which teachers attempt to develop and sustain a sense of vision and agency. The notion of ‘tension’ and ‘boundary’ is particularly useful here in identifying the elements of what teachers think ‘they want to do’, ‘they can do’, and ‘they cannot do’, respectively (see Appendix 4.1.5).

The overarching storylines of teacher narratives were imbued with a sense of ‘struggle’ rather than that of ‘victory’ or ‘problem-resolution’, and this suggested to me that the analytic strategy should focus on the role of teacher narratives in *creating cracks and ruptures* in school education (see

1.1.1). In this regard, the term ‘environmental education’ was frequently associated with policy or institutional discourse, namely, official ‘Environmental Education’ (EE) discourse, whereas the description of actual teaching process often entailed more complicated ways of making sense of what is involved in teacher’s environment-related activities: that can be conceptualised as ‘small’ environmental education stories (Hart, 2003). Congruent with other studies on teachers’ beliefs and actions (see 2.2.1), it seemed evident that even very passionate teachers such as Han encountered a discourse-reality gap in everyday school life (see analysis in 6.1.2). As Barrett (2007) points out, the gap can illustrate a teacher’s ‘self-disciplining’ process leading to conformity in her action. Yet, we also need to question: what is official environmental education discourse? Is the boundary in/outside of the discourse solid enough in the teachers’ accounts, or in a more general context (e.g. EE in Korea)? Grappling with this issue requires taking a closer look at which points the teachers’ criticism and challenges began, and where the subtlety in teacher’ tone and voice emerged, and hence meanings are resistant to articulation. Otherwise, we may fall into the trap of valorising the objectivity of personal narratives (Sykes, 2001), presuming a clear boundary between oppositional discourses based on teachers’ narratives alone.

Related to this is the idea of a ‘narrative strategy’ (see 3.2.1), through which teachers create meanings. It can reveal the contradictory and “shifting” nature of discourses (Casey, 2005, p.659), rather than be taken as the innate characteristic of teacher narratives. In this sense, the recurring terms: ‘environmental education’, ‘environmental educator’, ‘the environment’, ‘curriculum’, should be seen as ‘discursive categories’ (Søndergaard, 2002) to examine the mediated nature of the conditions of meaning, that is, by interrogating *what place or location of stories involve such categorisation?*, as predicated in the discussion on the narrative-discursive approach in 3.1.2. For example, the sociologically-oriented rationale for role/identity analysis (see 3.3.2) requires a concurrent examination of both self-identification processes, i.e. teacher’s identity-building and constructing, and the categorising discourse that creates the good/bad/odd teacher. Also, a teacher’s ‘environmental’ knowledge is seen as a discursive site in which a teacher’s beliefs, values, and knowledge meet with pedagogical demands (e.g. pupils’ expectations of environmental learning), and prevailing cultural narratives of ‘environmental’ ‘issues’ that may operate as a discursive framing in defining what is culturally relevant or valuable subject matters.

In the following, the first axis of location of stories - ‘personal’, ‘institutional’ and ‘cultural’ space - where particular themes are embedded, is discussed in terms of the three research themes that were introduced in 3.3, and key concepts and perspectives that will be further introduced in each analysis chapters.

Theme 1: Teachers' life experiences as a legitimate source that contributes to sense-making about environmental education

Talk about their motivations in environment-related activities in schools was closely related to the teachers' self-consciousness and reflection on who they are and who they want to become. The process of sharing cultural histories (4.2.2) meant the teachers and I collectively began to locate personal thoughts and experiences in a socio-cultural milieu, and reconstructed their meanings by thinking about the reasons for environment-related teaching and personal initiatives on environmental action. For example, the meanings of experiences in the student movement in the 80s and its influence on some teachers' 'activist identity' were challenged when the stories needed to be connected with the time/space relevance – 'now in here'. Also, metaphors such as 'progressivism' (Han), 'ideal' (Kim), and 'taste' (June) seemed to add a distinctive character to the sense-making of their actions and reasons in their personal life experiences. Similarly, everyday mundane, environment-related episodes including the use of handmade cotton sanitary towels (Han), child-raising (Lee and Young), and mountaineering activities (June), were useful hermeneutic tools with which to grapple with the issue of agency and action: being/becoming somebody to whom the environment matters. The (re)presentation of stories of teachers' embodied experiences became mainly concerned with the 'formative' narrative characteristics with a focus on the teacher's growing recognition of learning, identity seeking, or projects. I began to reconstruct the stories based on this understanding, and this eventually developed into short narrative forms, with a title that suggests a teacher's self-understanding in terms of his or her identity 'claims', as follows:

- "As if I've got a compass." (Lee)
- "I do what I want to do." (June)
- "I'm a slow learner." (Young)
- "I took it on board." (Han)
- "This is my ideal." (Kim)

By focusing on telling teachers' stories as making sense of their personal vision of life and career, to understand such stories invite readers to think about what matters to teachers themselves in engaging in environmental education, therefore teachers' autobiographical narratives as representing teachers' action and theories of action that make boundaries of identity, professionalism, and curriculum blurred and crossed – the two cases of which are the subsequent research themes.

Theme 2: Teachers' professional identities and voice in school institutional context

Yet, the movement in the 'scenes' in the narrations from personal life contexts toward institutional life and teaching practice meant a clear discrepancy between personal identity seeking and institutionally constituted meanings of the teachers' roles and responsibilities. Talk about their struggles in putting their ideas into practice often involved changes in tone of voice, e.g. when it referred to other teachers who were not necessarily sympathetic to environmental education. Negotiation was the key term to capture the narrative tensions between 'what they want to do' and 'what they can't do', which made the stories largely about 'what they can do' in limited ways. Interestingly, the rhetoric of pro-environmental educational initiatives was criticised as being only instrumental, but also received strategically, by teachers. In contrast, teachers' own interests in environmental education were much more diverse in approach, and often entailed radical thinking on the aim of teaching:

"I used to ask myself, "What indeed should I teach in my earth science class?" The situation is even harsher in high schools because of the university entrance exam. I dislike finding myself cramming knowledge for examinations, repeatedly saying to pupils, "This is very important, so make sure you memorise it." What am I doing? This is the most difficult part in teaching. What should I teach?" (Han, H2)

Stereotypical ideas and images of environmental education and teachers who are concerned about it are another site in which social categorisation takes place, as are the extent to which teachers' self-identification processes recognise and possibly challenge the categorising discourses, especially in terms of the porosity of or congruence between teachers' ideas about what it means to be a 'good teacher' and an 'environmental education teacher'. Three groups, - science, humanity and Environment, illustrated markedly different processes in defining and becoming 'environmental education teacher' in the institutional context, particularly in terms of their sense of confidence and persuasiveness.

Theme 3: Teachers' environmental curriculum narratives as windows into the cultural practice of meaning construction in relation to the environment

That teachers' sense of confidence and persuasiveness in the enactment of an environmental curriculum is notable in that it can illuminate the lack of institutional support in the preparation of curriculum, that is, everything is up to the individual teacher's efforts. The individualised practice of environmental education is suggested in teachers' prioritising particular curriculum topics, based on different pedagogical purposes and contexts of action and experience. For example, Han's

‘alternative energy’ teaching cannot be fully understood without the stories about her personal history since her involvement in NGO activities. On the contrary, Environment teachers’ interest seemed to reflect a pragmatic perspective: what works or is effective in the actual classroom teaching. In any case, commonalities can be observed: curriculum stories about environmental education foreground a teacher’s own efforts and learning in developing or expanding their curriculum repertoires.

In my view, environmental education is not about teaching specific topics, but about attitudes. Taking sceptical attitudes towards things addressed in the newspaper. [...]In this way, they realise the myth hidden in advertisements, and they find it very exciting. This is what my teaching aims for: to encourage pupils to question, and if things are not trustworthy, then go on to ask, “How can we investigate the truth?” (June, J1)

The view of teacher as ‘curriculum-maker’ sheds light on teachers’ preferred teaching approaches or subject matter, but crucially also on the manner in which orders of discourses are explicated, or endorsed by themselves, other teachers, and pupils, e.g. how certain pedagogical discourses are prioritised? Notably, contemporariness and the locality of environment- and sustainability-related issues often inform the current ‘hot’ topics to be taught. For example, absence of climate change in teachers’ curriculum priorities in ways that go beyond the scientific focus and deal with stories themselves was evident, and this might be explained in relation to less attention taken by the Korean media and public domains by the time of interview – for example, given the impact of powerful stories such as Al Gore’s film “*An Inconvenient Truth*”. In many cases, teachers addressed how they selected and utilised the media reports on science-related controversial issues, which suggests that multiple social meaning-making systems and processes that constitute the realities of ‘environmental issues’ are key mediators of curriculum practice.

Science stories (3.3.3), especially those that convey messages of ‘heroism’, as evidenced in the stem cell research scandal in Korea, were the prominent resource in the mediation of the pedagogical production of meanings, and others included culturally significant narratives of ‘well-being’, ‘health’, ‘nature’, etc. By analysing different curriculum categories as composed of multiple stories, varying degree of teachers’ own sense of efficacy or confidence in their pedagogical knowledge could be examined in terms of the question of what it takes to develop an environmental curriculum. Thus the analysis can also raise questions about what are legitimate ways of developing and implementing an environmental curriculum given the uncertainty and risk that problematises easy fixation of meanings of the environment. The key data source for analysis is the six curricular topics that reflect various modes in pedagogic meaning construction under the influences of cultural narratives. These are:

- Alternative energy
- Environmental issues
- ‘Well-being’ and health
- Biotechnology issues
- Nature experience
- Green education

To conclude, each theme deals with different spaces in meaning-making systems, but it is acknowledged that they are arbitrarily divided, since there are overlapping zones in the social practices of teachers’ environmental education: the personal, institutional, and cultural, respectively. In terms of methodology, ‘personal’ space is where teacher’s self-understandings are told in ways that are meaningful for themselves, while the other two are located within socio-cultural discourses and narratives. ‘Institutional’ space refers to where the stories of teaching and professional identities are told, while ‘cultural’ space goes further outside the school boundaries to include cultural narratives of the environment.

This categorisation is admittedly only one way of addressing the different purposes of the inquiry. Clandinin and Connelly’s (1995) distinctions about teachers’ ‘sacred’, ‘secret’ and ‘cover’ stories might also reveal tensions between official educational narratives and teacher’s personal practical knowledge. However, in this study, ‘cultural’ space was added to recognise that meanings of the environment cannot be fully understood within the institutional space, given the influences of or input from broader socio-cultural meaning-making systems such as pop culture and media. The similarity though is the basic idea that underpinned both categorisations: ‘burrowing’ (Connelly & Clandinin, 1990) or a ‘zooming-in’ strategy for the interpretation of stories. Other strategies might include fully-fledged life histories of individual teachers (e.g. Casey, 1993), or personal narrative analysis (e.g. Chase, 1995). Yet it is important to note the approach here differs from ‘storytelling case studies’ (Bassey, 1999, p.58) that serve the instrumental purpose of ‘cases’ of the research phenomena. Instead, three spaces in which teachers’ stories are told can be seen as informing ways of developing ‘frames’ that illuminate specific aspects of the phenomena: that is, they offer a space to consider the particular stories that need to be told.

4.4.2. Beyond personal narrative: making links to other sources of teacher narratives

In developing the three dimensions of analysis in this way, the different roles of teachers' stories within each space of meaning-making systems need exploring and clarification. All three analyses go beyond personal narratives, namely, by reconstructing teacher narratives by developing *critical voices through and towards teachers' own accounts*. In terms of methods, it means *contextual and intertextual analysis* with two folds: i) how stories can be read differently, and ii) what aspects of values, voices, or perspectives can be explored or illuminated from the (tentative) interpretation of stories (see below Table 4-3).

Other sources of teacher narratives were also used to strengthen interpretations and the analyses drawn from the narrative analysis, and each data source was selected to address relevant issues in each research theme, that is, which 'surround' teachers' stories, as follows:

- Students' reading of five teachers' short stories: theme 1
- Newspaper reports on school environmental education in Korea: theme 2
- A research project on exemplary science teaching in Korea: theme 3

The main objective of developing a doubled form of analysis - the analysis of teachers' own accounts, and textual analysis of other sources in each theme - is to produce critical hermeneutic spaces for interpreting and using teacher narratives. In theoretical terms, it requires two strategies: 'understanding', which asks questions the text insists upon, and 'overstanding', which asks questions the text does not pose (Culler, 1992, cited in Sykes, 2001, p.17). According to Culler (1992) and Booth (1979), respectively, 'overstanding' or 'extrinsic' questions that ask what is outside a text enable a more critical understanding of a text in that it poses a question about what is forgotten or taken-for-granted (Sykes, *ibid.*), which can then be illuminated or used to inform critiques of what is told and considered as normal. Sykes (2001) herself developed a mixed method for life history data analysis, by juxtaposing competing theoretical approaches (speech act theory, psychoanalysis, and deconstruction), as multiple tools to explore alternative meanings that are not captured by one theoretical framework. In this study, data rather than theories are the objects of understanding and overstanding, in making links between different sources of teacher narratives by considering 'intertextuality' in each source, in that, as Fairclough states:

Intertextual analysis shows how texts selectively draw upon *orders of discourse* – the particular configurations of conventionalized practices which are available to text producers

and interpreters in particular social circumstances (Fairclough, 1992, p.194, original italics)

In other words, my primary concern by developing a multi-layered textual form of analysis in the next chapters is to create discursive spaces, with respect to how particular ideas, values, and perspectives become available in each text, e.g. as specific discourses²² of education or environmental education, and how related, compatible, or conflicting the meanings are among the texts. In terms of narrative genre, this means a shift from ‘personal narratives’ where the authentic voice of ‘I’ – the teachers, tells the story, towards multi-vocalised critical hermeneutics in ways that connect teachers’ concerns and knowledge to theoretical and practical issues in education and environmental education. In theorising the method of analysis this way, more contextual and procedural justifications on ‘bridging analysis’ (see 3.1.2) are accounted for, according to the relevance to each research theme.

Chapter 5: What does engaging in environmental education mean to teachers themselves?

In developing texts for the first theme of inquiry into meaningful teachers’ stories, the main issue is to ensure the ‘truthfulness’ of the stories (see also 4.4.1). Presentation of the teachers’ stories was inevitably the researcher’s work, and reduction and editing was unavoidable. Rather than taking representation as an unworkable problem, my goal was to reconstruct the stories in ways that allow intersubjective readings and writing. ‘Layered texts’ and the following collaborative discussions in Chapter 5 were written by taking a ‘self-conscious approach’ (Coffey, 1999, p.145) that considers authorship and audience in ways that invite different frames for reading. In terms of inquiry, the main concern is to explore the ways of telling teacher narratives as it matter to teachers themselves, in that teachers’ life experiences and telling tales about self-understandings in itself are considered legitimate source of knowing and knowledge concerning fundamental questions about “why should teachers engage in environmental education?” While presentation of five short stories and my interpretation is an attempt to get at this understanding, it is noted that other perspectives, e.g. theoretical or experiential frames, are alternatives. I designed discussion groups to recognise *what might be other ways of reading teachers’ stories?*, and invited two groups of students (fellow research students and Korean undergraduate students, both studying at the University of Bath), the first of which brought theory-based readings, i.e. as students of this research field, and experience-

²² In this respect, particular methods such as ‘discourse analysis’ (Popkewitz & Brennan, 1998) or ‘critical discourse analysis’ (Luke, 1995) were considered, but not technically applied in the analysis, in the sense that the focus of inquiry remains on how the interpretation of teachers’ stories as the main data source can be used to inform critical understandings of other narratives of teachers, rather than the other way around.

based readings, i.e. as students who experienced the Korean schooling system, but not in an exclusive way. The main themes of discussion were as follows (more on procedures and contents are in Appendix 4.3.1):

Table 4-3 Two discussions on teachers' stories

Korean undergraduates	EE research students
1. General understanding of the contents 2. Educational views of two teachers - Education/ science education/ environmental education – and their relationships - Educational potentials and critiques - Comparison/contrast between two stories 3. Understanding of environmental education - Your own thinking, experience, and stereotypes and images - Critique of two teachers' environmental education teaching approaches - Potential in the implementation - The relationship between your schooling experiences and EE 4. Reflecting on your own schooling experiences - Memories of the teachers (good, bad, etc.) - Your own definition of good teacher - The benefits of public education, and the limit - Critique of our educational system - Thinking about quality education	1. If you see the stories as a genre of literary work rather than academic research, what are three words (or more) that describe the first impressions you've got about each story? For example, you think, - This story is... - This teacher is... 2. What did you find unexpected or less clear in understanding the teachers' 'environmental education'? 3. Considering potential comparisons and contrasts between five science teachers, can you identify some characteristics which are distinct to each story? Also, related to this, how much do you sympathise with the titles given?

Chapter 6: What does it mean to be/become an environmental education teacher in the current educational context in Korea?

To address this question, the primary methodological concern has been to locate teacher narratives within the institutional schooling context, in order to illuminate teachers' everyday school experiences and thus understand what it takes to be/become an environmental education teacher in Korea at this time. The teachers' voices seem to suggest more struggles than victories in envisioning their professional identities through environmental education. In fact, in their accounts, it was recognised that 'environmental education' had become a popular concern in schools to some extent, however, those teachers' beliefs about environmental education that go beyond a narrow definition suggested that constant identity negotiation is necessary to act upon one's beliefs within the constraint of curriculum space and expected responsibilities. But it is through negotiation that alternative professional identities can be sought, therefore it is possible that teachers' experiential

stories can provide critical insights into *the prevailing narratives of what is environmental education and who is environmental education teacher, and how they may be deconstructed.*

The search for stories that construct other ways of ascribing teachers' responsibility for environmental education in schools that are probably in tension with teachers' own way, relied on newspaper articles from 1990 to 2006 in Korea collected through the online newspaper search database (www.kinds.or.kr). Due to the limits of the database, it was not possible to find reports published before 1990. But given the fact that the media coverage of environmental education was related to key events such as the Rio Earth Summit (1992) and the Environment curriculum developments in Korea (mid 90s), the time limit does not seem significant. Among the total of 322 articles (301 located by the keyword 'environmental education' and 21 by 'ecological education'), those reports that specifically focus on teachers (either with a focus on teacher(s) or environmental education activities and approaches in schools), were selected for analysis. Some examples are as follows:

Table 4-4 Samples of newspaper coverage on school environmental education in Korea

Date	Newspaper	Author (on whom)	Title	Keywords
93-11-22	The Hangyerae	Journalist (teacher)	Primary school teacher published a book for EE	Book title - "We are environmental guards", action and practice
94-01-26	Seoul-sinmun	Journalist	EE still yet to take root (1)	A need for EE in schools; a lack of policy support; rhetoric-reality gap, exemplary cases
94-01-27	Seoul-sinmun	Journalist	EE still yet to take root (2)	German cases
94-01-28	Seoul-sinmun	Educational expert	EE still yet to take root (3)	A need for educational approaches to long-term solutions to environmental problems, educator's role, a call for policy
94-05-26	Chosun-ilbo	Journalist (head teacher)	'Our special teacher'	Special stories about one head teacher, an initiative on environment sponsoring saving account
94-06-27	Segye-ilbo	Journalist (academics)	Strong focus on EE needed	ESSD, curriculum change in schools and higher education
94-09-08	Chosun-ilbo	Journalist (parents)	"Save water, mom"	An exemplary story of one preschool's EE
94-09-10	Chosun-ilbo	Journalist (teacher group)	600 teachers gather for EE group	Science teachers, practice-centred research, campaigning
95-11-13	Hanguk-ilbo	Journalist (teacher group)	Seoul EE research group	Love of nature, beyond knowledge, a head teacher's passion
95-11-15	Seoul-sinmun	teacher	"Walk the talk is real EE" said a primary teacher.	Action, practice, more than slogans
95-12-13	Seoul-sinmun	EE academic	EE leads to future for all	EE is the ultimate solution to environmental issues, a call for policy support
96-06-04	Donga-ilbo	Education academic	The crisis of civilisation and EE	a call for capacity building for overcoming environmental crisis through education
96-06-24	Donga-ilbo	Journalist	Ms.Go's hands-on EE	teacher's belief, greenscout; experience and action based EE
96-07-15	Donga-ilbo	Journalist	The 15th Citizens' Forum	"green education", alternative life styles, alternative community movement
96-08-05	Donga-ilbo	Journalist	Development or Environment?	Malaysia, Singapore, Thailand, Vietnam, Phillipines, Korean students' study trip to

			Asia's problem	South Africa
96-08-19	Donga-ilbo	Education academic	Exam hell leads to environmental illiteracy	EE curriculum space in schools, shortage of qualified teachers, policy failure
96-09-20	Donga-ilbo	EE academic	An urgent call for EE	EE in crisis, governmental budget cut

Chapter 7: What are pedagogical meanings of the environment given the role of cultural narratives?

Six curricular topics illustrate different modes in repertoire-making processes in which prioritising, selecting, rehearsing, and practising take place dialectically, and a teacher's sense of competence or efficacy appear to varying degrees. In this, the role of cultural narratives seems dual-fold: teachers actively use cultural 'resources' from their own (critical) perspectives to address current environmental issues, but teachers' thinking and action is also impinged upon by culturally available options. For example, media coverage of environmental issues afford environment-related subject matter that address pupils' everyday concerns, such as food or health. However, using real cases of environmental issues also seem to constrain ways of developing pedagogical approaches, for instance, teachers' repertoires of pupil-centred, inquiry-based learning tend to be grounded in simple framings of environment vs. development, rather than other possibilities such as historical and cultural understanding of environmental issues. The analysis of different curriculum repertoires then shows how difficult it is to define 'relevant' pedagogic meanings concerning the environment, given the uncertainties and risks that science and environmental knowledge entail, and the dynamic cultural processes that produce dominant frames and messages as interpretive tools. From a teacher's point of view, repertoire-making requires engaging with instances of hybridity in discourses or interdiscursivity, and the depth and diversity of repertoires vary, depending on a teacher's personal interests or subject expertise.

This raises further questions about "*how teachers can become effective in teaching?*", in the sense that repertoire-making entails teachers' capabilities of dealing with the complexities involved in meanings and meaning construction tools. Recognising that there is no easy way to conceptualise effective or exemplary teaching, teachers' stories of curriculum may offer alternative meanings, or analytic tools for problematising ways in which terms such as 'quality', 'effectiveness', or the 'exemplary teacher' are defined in the current school context. In this regard, the recent initiatives on quality classroom teaching seemed to provide relevant materials. The key document I chose is the report on government-funded research project (KICE, 2002a, b) that was conducted as a means to responding to public concerns about the quality of public education since mid-90s, widely

discussed in terms of ‘school collapse’ (see 2.2.2). The analysis of key characteristics of exemplary science teaching based on interviews with exemplary teachers (KICE, 2002a) also enables an interesting contrast with the teacher narratives in this study, in terms of ways of constructing stories about teachers’ curriculum practice by weaving common story elements (see below) into a plot of ‘exemplary teaching’, amongst other possibilities for framings:

Table 4-5 Story elements in exemplary teaching

What they are ‘exemplary’ about:	Story elements in each teacher’s stories are:
<ul style="list-style-type: none"> ▪ Cooperative learning ▪ The use of ICT ▪ Hands-on activities ▪ Pupil-centred inquiry ▪ Real-life issues ▪ Pupils’ curiosity and interest ▪ Teacher collaboration 	<ul style="list-style-type: none"> ▪ Teacher profile ▪ Teacher conceptions on science education practice ▪ Key characteristics (Teacher’s definition of good teaching, curriculum and contents, instruction methods, evaluation, professional development, etc.) ▪ Motivational factors

Table 4-6 outlines key ideas of data analysis methods in this study that are based on two data sources (teachers’ stories as main, and others as supplementary) and three foci:

Table 4-6 Linking personal narratives to other narratives of teachers

How can teachers' stories be read differently?	The main point in teachers' stories	The use of stories about teachers
	1. What does engaging in environmental education mean to teachers themselves?	
	Five teachers' life stories	Students' reading of stories
	Teachers' sense-making about their engagement in environmental education in terms of their lives and careers, e.g. 'vision'(s), and personal and professional identity formation.	What might be other ways of reading teachers' stories, and what are necessary to read teachers' stories as if they mattered to teachers themselves?
	2. What does it mean to be/become an environmental education teacher in the current educational context in Korea?	
	Three groups of subject teachers (science, humanity and Environment)	Newspaper articles on school environmental education in Korea
	Teacher professionalism as reflexive identity work by which teachers engage in constructing meanings	What are prevailing narratives of what is environmental education and who is environmental education teacher, and how they may be deconstructed?
	3. What are pedagogical meanings of the environment given the role of cultural narratives?	
	All eleven teachers' curriculum stories – six topics	A research project report on exemplary science teaching
	Environment-related curriculum as an act of repertoire-making or expanding, but also mediated and constrained by cultural narratives	What issues are raised by teachers' curriculum stories in constructing exemplary teacher discourse?
	<p style="text-align: center;">←-----→</p> <p>What aspects of values, voices, or perspectives can be explored or illuminated from the interpretation of stories?</p>	

Developing these methods of analysis in ways that address the specific issues raised by reading through/beyond teachers' stories has been the study's unique contribution to an understanding and exploring of the value of teacher narratives. In this, individual teachers' stories were read differently and thus integrated into different themes of analysis, as in the case of Han's story in Figure 4-2.

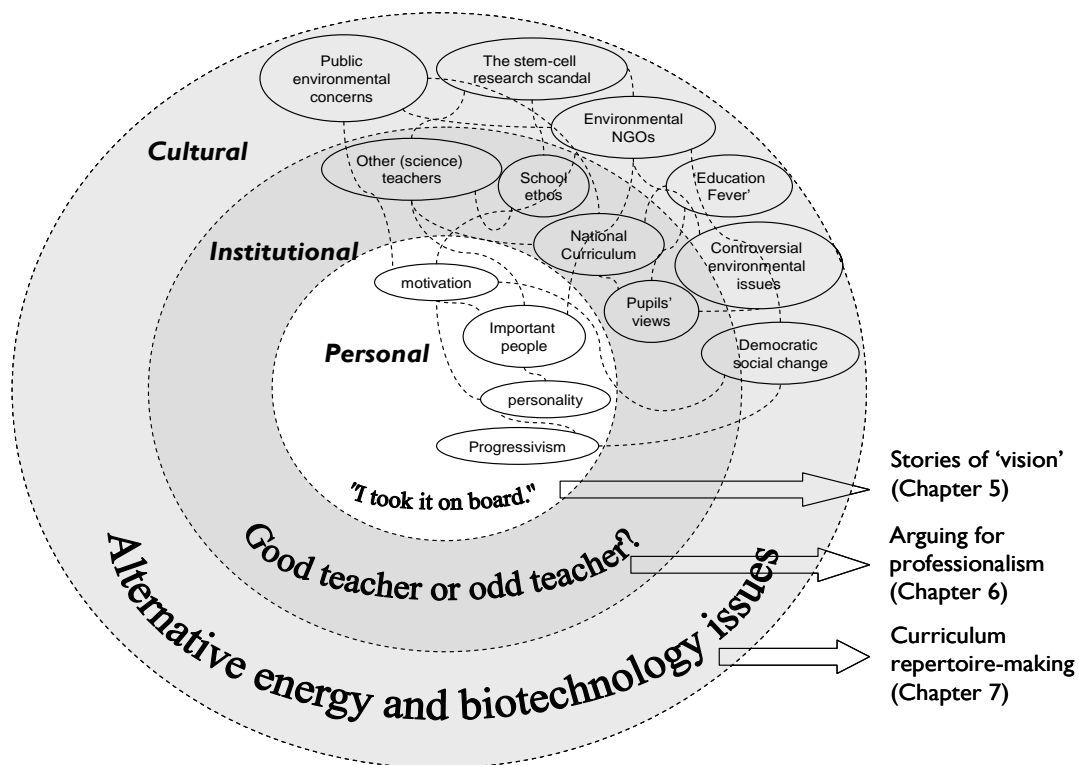


Figure 4-2 Making sense of teachers' stories (Han's case)

Prior to moving on to three analysis chapters developed based on this framework, a brief introduction to the role of each analysis chapter in crafting the study's main arguments seems necessary. Chapter 5 serves an introductory role in data analysis, through the sketches of five teachers' 'vision(s)', told and understood as stories by which teachers' personal and professional identities are fashioned. Rather than being 'analytical', the inquiry in Chapter 5 focuses on understanding teachers' narration during interviews and the context in which asking "why" to teachers concerning their motivations for environmental education prompted particular ways of making sense of teachers' environmental education - that is concerned with their vision of lives and careers. The vision narratives then serve to identify and exemplify the value of stories. Then, the two following chapters further develop a critical investigation into discursive practices into school institutional context and curriculum development, by examining what meaningful actions are enabled through teachers' living their stories, therefore what are further issues raised by these stories as well as how stories are shaped and limited.

Chapter 5. An introduction to teachers' stories of vision: blurring personal and professional identities

❖ Chapter introduction

Chapter 5 is the first of three narrative analysis chapters, and sets out a series of understandings of teachers' stories as formative narratives of teachers' environmental education. At their core, these stories of environment-related experiences illustrate diverse senses of agency and vision. Five teachers' short stories are presented via framings of their plots ("vision") and key narrative themes, with a focus on the teacher's own ways of making sense of their environment-related experiences by 'blurring' the boundaries between personal identities and professional role as teachers. This introductory part of the analysis then identifies the significance of telling stories that are meaningful to teachers themselves in furthering the investigation of the value of teacher narratives, and prepares the ground for addressing the discursive practices of teacher professionalism and curriculum development that the subsequent two chapters are concerned with, respectively.

The chapter discusses four main themes:

- the process of developing formative narratives with a focus on the storyline;
- five teachers' stories alongside the researcher's interpretations and reflections;
- the implications of vision narratives in understanding teachers' theories of action; and,
- discussion of ways of understanding teachers' narratives through authentic and critical engagement with the stories.

5.1. Emplotting a vision

A story describes a sequence of actions and experiences done or undergone by a certain number of people, whether real or imaginary. These people are presented either in situations that change or as reacting to such change. In turn, these changes reveal hidden aspects of the situation and the people involved, and engender a new predicament which calls for thought, action, or both. This response to the new situation leads the story toward its conclusion (Ricoeur, 1984, p.150, in using Gallie's (1964) idea of story).

People tell others who they are, but even more importantly, they tell themselves and they try to act as though they are who they say they are. These self-understandings, especially those with strong emotional resonance for the teller, are what we refer to as identities (Holland, Lachicotte, Skinner & Cain, 1998, p.3).

The utterances about actions and changes relating to participation in environmental education in the interview texts are rich and diverse, as are their explications of their motivations. Although the ‘stories’ were not automatically generated in direct accord with Ricœur’s conceptualisation noted above, narrating their own histories of environmental education did entail teachers engaging in a search for, and articulation of, meanings and identities concerning action taking and decision making, and this typically required the invoking of significant critical memories from the course of their professional and personal journeys.

Thus, this chapter presents teachers’ stories of ‘being’ and ‘becoming’ somebody, e.g. a science teacher, concerned citizen, parent, environmentalist, etc. - their stories of ‘vision’ - and as such, it serves to illustrate how teachers’ self-understandings can begin to unfold in and through their narratives. Firstly, ‘fragmented narratives’ (later developed into the text in the boxes below) in the ‘raw data’ make it possible to capture a sense of ‘direction’. Secondly, formative narratives can then be elaborated in terms of those narrative features that suggest signification within the teachers’ own understandings of their lives, i.e. talk on more reflective, identity, and futures-oriented matters. As will be shown below, this includes storylines of teachers’ motivation for participating and sustaining environment-related activities that revolve around notions of “plans”, “the second round of life”, a “guide”, or a “compass”, and where their tone of voice was often inflected with a sense of resolution or conviction.

We can thus read the teacher narratives in this chapter as stories of ‘progress’ that relate trajectories in teachers’ personal and professional identity development²³. Some teachers were able to bring ‘for the first time’ memories of their participation, e.g. meeting with significant colleagues, while others more naturally focused their talk on actions in the present and on future plans. In common, their stories contain elements of ‘critical stories’ that “shake” their sense of identity (Sfard & Prusak, 2005, p.18; Hart, 2007a, p.204). Some of these stories and episodes were easily identifiable from their tone of voice and emotionally charged narration, while others invoked curiosity and required clarification through follow-up discussion. The short narratives in the boxes were

²³ But this idea needs a caution. The idea of a ‘progressive’ version of life story does not entail the correspondent changes in actual life course, and the essentialist claim of a relationship between narrative structure and identity ‘development’ (Labov & Waletzky, 1967; Riessman, 1993), which is a typical storyline of a Modernist tale (Plummer, 1995).

constructed from such material, followed by a fleshing-out of narrative segments involving their beliefs and values, personal life context and interests, and activities and actions related to environmental education. However, it is noted that this approach to interpretation inevitably subjects each narrative to a twofold reduction: of the richness of the actual storytelling process, and its vicariousness. This is in spite of any attempt to keep narrative voice and nuance as close as possible to the spoken word.

To encourage both a liberal as well as a guided reading, the presentation format that follows includes three layers of polyvocality (see 3.1.2): Each teacher story begins with a brief introduction to the context and foci in order to prepare readers for the main story (in the box) through the use of the teacher's own words (although translation and editing are involved). The follow-up narratives present my engagement with the narratives, via reflection on the themes that comprise the plot of vision, such as 'learning' (Young), 'taste' (June), 'compass' (Lee), 'progressivism' (Han), and 'ideal' (Kim), to organise my thinking and understanding of a whole story. The developed narratives then invite the reader to gain an understanding of what it means to be a teacher who wants to do environmental education in relation to particular personal and cultural situations. Thus, the narratives encourage acts of identification and differentiation from one's own point of view, as we often do in reading novels. For Elbaz (1991, p.6), while such ways of representing teachers' stories constitute part of the experimental endeavour, they should be undertaken via forms that involve less of a risk of "taking teachers' stories out of their hands". The vision narratives are then discussed in terms of their significance on understanding teachers' environmental education with personal and professional identity formation processes at its core.

5.2. Making sense of vision: five teachers' life stories

❖ Lee's story: 'compass'

Lee has engaged with an environmental education teachers' group (termed throughout, the 'EE Group'; a nationwide network of environmentally conscious teachers) since the early years of the mid nineties, and now works as a leader of the local sector?. Like the other teachers in this study, he was not convinced whether he could fit with the criteria for this research, especially with the focus on 'teaching'. On his reply to my invitation to be interviewed, he wanted to be clear if it would still be okay to talk about activities that were 'beyond' the school fence. Therefore, our conversation centred on his experiences in the EE Group, and how he understood these might have influenced his ideas about education and the environment.

In the early years, when the group remained small, the members of the group used to go on field trips through which they could build capacity for developing outdoor education programmes. He met his wife during this time; she was also actively involved in the group. Now his major concern as a leader was how the group as a whole could envision their identity and sustain their passions, namely, how they could “blossom” beyond conventional activities and approaches. He felt strongly responsible for this but remained unconvinced and uncertain what to do. Furthermore, he and the members had become less devoted than before, largely due to childcare responsibilities. The year of the study, they had a loose year plan, and their main project would be to review educational programmes and materials in Germany, with support from one teacher who recently went on a study trip there.

In fact, Lee’s teaching narrative was weak in the sense that he felt the things he could do in a high school were very limited. Having worked at a private school his entire teaching career, he found the school ethos rather “quiet” compared with that of a state school. In the classroom, he characterised his instruction style as “free-range” rather than “strict”. In recent years, he had begun to create his own “database” on pupils’ perspectives of environmental issues, and wanted to see how pupils’ ideas and perspectives might change through the two years of the biology classes he taught. However this plan was to be obstructed the year of the study, as the new head teacher’s plan would reshuffle him to year 3 (the final year in high school) classes, where all his energy and efforts should be directed towards preparing students for the university entrance examination.

Teaching environmental education in high schools is extremely challenging and limited. So I’m not convinced whether I’m the appropriate person you’re looking for. I strive to make the most of curriculum space. Since last year I’ve attempted to compile a database on the ways that pupils make decisions on local environmental issues. Generally pupils seem to approve of ideas like protection or conservation without deliberative processes. I wonder whether this sort of disposition comes from their relative affluent background in this region. In this way, I can try to understand, if only vaguely, what this young generation thinks about their environment. But apart from this, there’s not much space for environmental education.

I became a leader of the local section of the EE Group several years ago. The members’ efforts produced a series of environmental education materials, and this year we planned to work on food-related issues. But it’s not easy to bring people together and sustain activities. We discussed the identity of the group lately. This is not a ‘club’ type of group

activity, and we need something that links us together. I'm not sure what it might be. Doing things feels as natural as water-flow. In an earlier period, the group was united. Now we work on a local basis, and teachers' interests have diversified. For example there are a small number of teachers in the group who have been working on theoretical development of green education, and they seem to get on very well. The group in general perhaps needs some sort of new generation who can drive change. But we cannot guarantee some sort of a strong identity or training opportunities to new members as we proceed by updating previous activities. At the national level, there are some collective activities when big issues come up. However, we (the environmentalist side) have been losing to the 'development' side in every case these days. There was also a 'No Golf Declaration'²⁴ by teachers. I am not very actively engaged in these big issues. I am rather like a 'shadow person' lately.

I don't have too many special memories about my childhood and school days. I can only recall that in those days students were forced to sit and study day and night. As if nothing was more important, and as if no anxiety about life issues beyond it existed. Although social movements had a big impact, high school students had nowhere to go. All the media were under the government's control. Few things were available when one sought to know. No help came from outside. And it was even my teacher who decided my study subject at university. I went to university in 1987, when demonstrating was a daily event, and most people around me were involved in it. It was such a discovery of a totally different world. After graduation, and military service, I had to decide what to do for a living. Perhaps I am not a teacher material given my personality. But anyway I became a teacher, and it was during my early years of teaching when I got involved in the EE Group, by the invitation of a colleague. The motivation at the beginning might be rather accidental. But later I realised this was something I genuinely wished to do in my heart.

It could be during this time when I felt I eventually found some sort of compass. Something I could lean upon. Sort of a firm conviction. As if it just clicked. So if somebody talks about it, I just can't agree more. It was about redirecting my future, and now, my child's future and the earth's future. In the end, this became the one I will pursue more than anything else. Surely it could not be the case if I had not been engaging with this group. I might say by now, [rather sarcastically] "science is almighty!" There are in fact those teachers who come to us to request teaching know-how. I could be one of them as well. But I was very fortunate at that time to meet these great science teacher colleagues who said, "Hey, why

²⁴ Golf has become a very popular sport in Korea since late 90s and the government's relaxation of planning regulations led to the marked increase in the number of golf course in recent years. Environmentalists have raised serious objections to the plans, and led an anti-golf campaign. More than 2000 school teachers and 30 MPs signed up for 'No Golf Declaration' in 2004.

don't you join us? We can be your compass!" ((Laugh)) And they turned out to be harmless and just wonderful. Thanks to them I was able to steer my life in the right direction with philosophies to live up to. And I became aware of must and mustn't as I matured, which I had never recognised before university. Central to this is doing more than is required at school. Now I know I can do more. I met a good guide on to the right road. It's as if somebody warned, "That will destroy the earth", at the right time when it mattered to me too, and I started to be able to look around the world. I don't want to live the way most of us live. I should live differently even if by myself.

- Lee, "As if I've got a compass."

Lee's voice tone expresses cautiousness and awareness of contingency. As he tried to reflect on the last ten years, his EE Group experience began to take on unique meanings related to his 'transformation' as a teacher. It was about shaping a "character" as a "good person". As he recalled, he would have led a different life if his colleague had not invited him to the group. It was accidental, but turned out to be very powerful and positive. He is the kind of a person who "listens", and this may have characterised the decisions in his life as less intentional or resolute, as with his university subject and the teaching profession. Probably the decision to engage in the group was made as simply as that. But this time, it was a breakthrough that later determined his lived philosophy that guided him onto "the right road", like "a compass". Fortunately, he has managed to carry this through so far, and does not want to lose it in the future.

"Compass" is a compelling metaphor. What does this mean exactly? Lee was rather firm in expressing his opinions about current environmental issues, as often identifying "we" in referring to like-minded teachers. As such, he was very much oriented to sustainable lifestyles, and wanted to develop teaching materials regarding this issue. But he sees himself as "soft" rather than strong-minded; as he puts it, "a shadow person". He might not be able to live in the way he wishes, but he keeps walking, however slowly, on "the right road".

❖ *Young's story: 'learning'*

Young specialised in biology (and science) education at university, and in 1999, passed the teacher examination that qualified her to teach general science and biology at a secondary school. Since then, she has taught biology at a middle school, and since 2000, following the invitation of a

teacher colleague with whom she worked at a previous school, she has been part of a Teachers' STS (Science-Technology-Society) Group.

While I knew Young personally, it was coincidence that I had the chance to meet her again during this study. She was two years senior to me at the department of biology education, but we had not met since 1998. I accidentally found her name among the authors of the book that Han (another interview participant) had given me. The book deals with teaching materials and curriculum approaches that could help teachers address value-laden issues in science classes, and it was written by the Teachers' STS Group. I was intrigued to know what motivated her to get engaged in the group and with the STS approach. My vague memory was she was a hardworking student, and as far as I knew, she did not seem to be very actively engaged in other activities at university. Considering my preconception that teachers' participation in environmental education tended to be related to participation in NGOs or student movements, to now recognise Young as an environmental education teacher came as something of a surprise to me, which was precisely the point for conducting an interview with her.

Young wasn't sure whether she would be the 'right person' for my research, afraid that she did not know very much about 'environmental education', but she was willing to accept an invitation to be interviewed. My initial intention for meeting her was to see how she understood the influence of the STS group experiences on her ideas about science teaching and environment-related ideas. An interesting comparison with Han's case (see below) might then be expected in the way that their different personal values and dispositions may have come to shape their own distinctive ways of experiencing and interpreting a shared experience, namely engaging with the STS group.

In fact the STS approach was not an entirely new idea for science teachers, as Young recalled, as it had been covered in the university curriculum. However, she only started to "grasp" what it really meant in practice since she had been engaged in the STS group. From her point of view, the gist of STS approaches is "to look at things from a different point of view". As her understandings and experiences deepened, the notion of 'change' became apparent for her in reflecting on her past teaching experiences and personal life, as she likened the former to a "formula" as a guiding rule that led to conformity in her life decisions and attitudes. Now she saw herself as a "learner" who learns, in large part, by listening to other experienced teachers. In picturing self-images in a future-oriented sense, she believed that nurturing a "critical eye" (or insight), i.e. looking at social phenomena more critically and insightfully, is crucial for what it takes to be a 'good science teacher'. As such, her interests were largely concerned with integrating value issues into science classes in which environmental education, or environment-related topics, could be part of the

teaching. In fact, her growing concern about healthy eating and sustainable lifestyles was noticeable in her talk about her everyday life context, especially about her child. However, developing this concern into a curricular theme remained at the level of ‘potential’, as she found difficulties in matching it with pupils’ own interests and concerns.

One thing I really wish to develop for my teaching is critical insight, so that I can teach things from various perspectives, if not eloquently. Then I can tell pupils such stories as, a science-related issue can be viewed from this angle but it can also be viewed differently from another. I wish to study more - read books to be able to do such things as media analysis, for example. So, in later years, when pupils recall me, they might think of me as, “The teacher who taught us something different”, rather than as just a common-or-garden biology subject teacher. I hope pupils will be able to think of science from different perspectives, for example, by considering ethics or values. Science is bound up with society. When the media deals with science in a certain way, pupils should be able to take this further and seek available alternatives. But I don’t think I can go as far as to say I do this well right now. I need to learn more.

Looking back, my life has tended to follow the rules and the steps as they’re given. And my teaching has as well, by mainly focusing on addressing curricular content in a textbook, rather than testing new approaches through my own initiative. But I have found myself slowly developing a critical eye on the ‘taken-for-granted’ things and this enables me to think from a different perspective. It seems to me that an STS approach can be as effective for teachers as it is to pupils, and in this way, I have found my own perspective or attitude changed.

I am also interested in devising experiments to teach science with more fun, and this group of teachers is well-known for such activities. However, it seems that too much is required of members if they are working for a big organisation. Doing extra besides one’s current commitments is burdening and can become unmanageable. If I did, [jokingly] I might be expelled from the house!

I am sometimes in a puzzle as to what to teach to pupils. School education disguises how our society actually works – as if it is driven by some invisible power relationship or political economy that persistently conveys false messages of morale and innocence. I believe pupils will also feel puzzled as they see the actual workings of the society betray how they’re supposed to be. Thus, I ask myself, what should I tell them as a member of this society?

It seems to take a long time and constant effort for people to develop their own value systems, let alone make changes in them! People need various experiences and constant exposure to the unknown. They can't do this on their own. It demands that they meet somebody to learn from, do something different, and confront new challenges. Then change will come. I still need more experiences. It sometimes feels stressful and difficult to sustain this mindset. However, I won't stop because it is helpful to overcoming my weaknesses. Having said that, I now believe that the teaching profession demands persistent learning. It seems crucial to keep up not only with subject knowledge but more importantly, deep insights as to how society works. This is what makes me continue in activities in the teacher group and with self-study, to increase my knowledge and to teach better than before. The members of the group have created a special bond since we have worked together for a long time. I am more of a listener than a speaker there, so I gain a lot of help from hearing about their experiences and perspectives.

- Young, "I'm a slow learner"

For Young, learning is valuable in the sense that it brings about improvements in teaching, and participation in the STS group was a way of engaging with learning and change. In contrast, strong beliefs and values concerning environment and education (potentially developed from an STS approach) do not appear to have a definite role in progressing her concerns and motivations. This was made clear when she began to reflect on her ideas about the 'good teacher'. Her concern has been to become more able, that is, 'learn' to be competent, in helping pupils engage with a critical, inquiry-based, learning process. Here, Young sees the role of a teacher as requiring the best of their efforts, to "listen to" pupils first rather than direct them, in order to understand their interests and concerns. She illustrated one pupil's case in her tutor group, describing how she felt rewarded in seeing improvements in his learning attitude and behaviour after her yearlong efforts in personal tutoring sessions. Furthermore, as she tried to make sense of what she wanted to achieve, her personal philosophy was understood more in terms of a teacher/pupil relationship than of any specific teaching approach or environment-related topic. In this way, her story could tightly interweave two spheres of concern: 'science' teaching and becoming a 'good' teacher. As in Lee's case, a 'contrastive narrative' relating to self-images was distinctive as she re-organises memories. But Young emphasises a 'learner' identity whereas Lee goes further to manifest his environmentalist orientation.

❖ *June's story: 'taste'*

I was introduced to June by a former colleague on the postgraduate programme. June had just experienced the first term of the Master's course at the time of her interview. Our conversation began with my question, "What motivated you to study in that programme?" Without hesitation, she said, smiling, "I wanted to start the second round of my life!" She has been teaching science in a middle school for fifteen years. She very much enjoyed teaching, and wanted to always be a "charming" teacher to her pupils. But envisaging what it would be like, as she got older, she was afraid of a big age gap with pupils that she did not see as easy to overcome. She planned an early retirement and dreamt of living as an environmental educator in later life. A Master's degree was one of the things she thought necessary to prepare for this "second" round of life.

Filled with confidence and certainty during the interviews (compared to Lee and Young), she was able to articulate what she wanted to do for environmental education. Her descriptions and argumentation about environment-related teaching approaches were vivid and clear. She also detailed one curricular topic she had developed, concerning how to guide pupils in their reflections on food issues, in terms of critical awareness on consumerism and scientific knowledge. She wanted to pursue 'consumer education' for her doctoral research. Given that her environment-related teaching experiences had been largely personal rather than a group activity or collaboration based, what she had achieved was very impressive. I became more and more curious about where this confidence and capacity came from.

She was not participating in any teacher groups, thus, her motivation for environmental education seemed to grow from her own thinking and experiences about ways of linking environmental concern with education. She attributed her ecological thinking to a naturally emerging disposition from outdoor experiences. She used to live in a traditional, wood-built house in the countryside, and often enjoyed family picnics in the outdoors nearby. She had a lifelong enthusiasm for mountaineering, and she enjoyed talking vividly about her experiences in the mountains: small and large, easy and difficult, summer and winter, and so on. Meanwhile, experiences of 'student movements' remained critical in maintaining her advocacy for social justice. In her view, 'consumer education' needed to integrate environmental issues with political economy, and "sociological knowledge" was helpful in this regard. Her daily life was full of reflection and action. She enjoyed discussions with her husband who shared similar concerns, and who had "expert" knowledge in sociology. Daily experiences such as cooking, housework, hobbies, etc. had become rich resources that inspired her ideas about environmental education.

In my view, environmental education is not about teaching specific topics, but about attitudes. Taking sceptical attitudes towards things addressed in the newspapers. For example, I consider analysis of advertisements very effective for pupils' learning. 'Well-being' is becoming a popular trend today, so when an advertisement says, "This is good for health", then people might just buy it without suspicion. But pupils should be able to question, for example, "Why is it good?" "What is the benefit of silver nanotechnology?" "How is it pro-environmental?" I think this is of paramount importance to a scientific attitude, and to environmental education. We should have a sceptical attitude towards everything, and not believe what advertisements say is things as they really are. For example, when teaching about food and digestion in the biology curriculum, pupils are encouraged to analyse the ingredients of 'well-being' milk. They are shocked when they find out that it contains excessive sugars, and is therefore even less healthy than normal milk. In this way, they realise there are myths hidden in advertisements, and they find it very exciting. This is what my teaching aims for: to encourage pupils to question, and if things are not trustworthy, then go on to ask, "How can we investigate the truth?"

I believe that in this way, pupils can change their attitudes toward the environment, most desirably toward a 'Small is beautiful' mindset. For pupils, developing good communication skills is a crucial learning process, and this probably requires more than conventional environmental education. This can be achieved through social studies or Korean classes too. But I think this attitude will eventually be contributory to so-called 'education for the environment'. It doesn't matter that pupils wouldn't choose environment-related professions in the future. However, the bottom line is, they have to be able to question every matter, such as, "Why should things be done this way?" "On what evidence does the government argue for this?"

I've been working for environmental education on my own. In fact, I was interested in the activities of the teacher union, but I didn't like the prevailing silence that disables the members being self-critical of teaching qualities. Teacher assessment has been a critical issue lately, prompting severe resistance from the union. In my opinion, it is only afraid of the criticism from the outside without conviction about social responsibilities for delivering quality education. However, I feel morally responsible for participatory action. I am very much individualistic rather than collaborative with other teachers. One of reasons I started the Master's course this year was to find a way of working with others by sharing my ideas that I've developed through experience. This is also the preparation for the second round of my life after I retire. My plan is to work for an NGO, offering my expertise and professionalism. I think my life has been very much privileged in terms of my family and every aspect. So, I feel morally compelled to do my bit for our society.

Although I'm inclined to work collaboratively, I find a rather significant difference in terms of orientation or 'taste', if you like. Environmental education groups tend to put too much emphasis on acting 'for' the environment. I can't agree with some of the arguments they make. I'm most interested in 'teaching' above anything else, and they're not very helpful to me in this respect. They seem to assume there's something that we can consider as intrinsic to environmental value, so what we do is promote this value. In contrast, my interest as a teacher lies in engaging pupils in critical debate through a rational communication process.

I grew up surrounded by beautiful nature, and mountaineering is my favourite hobby. I just love enjoying the aesthetic beauty of nature – walking in fresh air without too much concern for knowledge about trees and flowers. In daily life, 'small is beautiful' is the philosophy that I try to live up to. Of course, I can't just consider environmental value as the utmost priority in every matter. The aesthetic aspects of things are also important to me. But it seems aesthetic taste is gradually changing toward valuing the smaller as more beautiful.

I believe a good deal of sociological knowledge is required for wherever I work. To have some knowledge of Marxism if not believe in it, makes people view things totally differently from those who don't know at all. But it's not about what Marxism says, but about there being alternative views that enable us to perceive the realities. Then we can go about further pursuing being able to critically think about where the conventions are rooted and how. This is why I am intent on studying the field of sociology. Most importantly, it has been so delightful to live up to this attitude, feeling just right, as if my life progresses toward that which our society does, rather than pursuing selfish goals. This is how I like my life to become!

- June, "I do what I want to do"

"Taste" is a recurring and ambiguous theme in June's disposition. She regarded her fondness of nature as a matter of personal "taste", no more valuable than many other different ways of appreciating things, and little more than a matter of personal, subjective valuing, rather than a universal value that is integral to ecological thinking. Interestingly, she was rather sceptical about the formative influences of 'nature experience' in developing ecological awareness, even though for her, the experience was positive. This is not to dismiss the potential educational value of 'nature experience', but to represent her sceptical attitude toward a totalising discourse of environmental education.

June also knew she was an “individualistic” person. In contrast, collectivism - so called ‘we-ism’ - as interdependent consciousness, is deeply rooted in Korean culture. She often experienced this cultural atmosphere clashing with her values and lifestyle. She disliked the cultural ethos that imposes after-work social gatherings on teachers as if it was a duty. She often refused to join when she wants to go home to enjoy her own free time. Her point was clear. “I do things when I believe it is either enjoyable or necessary. And that belonged to none of these two.” This strong character was also distinctive in terms of professionalism. Admitting to the benefits of the engagement with the teachers’ group, she joined some conferences and visited some teachers’ groups, but only found it rather disappointing or experienced differences in orientation. In her view, to be able to help pupils to engage in a “rational communication process” requires teachers’ developing insights into the nature of science and controversial issues, and it also demands that they are able to teach beyond instructing environmental values. For now she wants to stay working on her own through self-study, thinking “there is a long way to go for the second round of my life.”

These tales of taste illustrate June’s strong self-belief, and seemed to provide a clue to understanding her story of environmental education as moving toward that of “I do what I want to do”. In this way, this particular environmental education story evolves through continuous effort to match personal dispositions with professionalism, in ways that make her feel “just right”.

❖ *Han’s story: ‘progressivism’*

Han was the first participant I met for the interviews. She was a leader of the teachers’ STS group, and was one of the early members in an Alternative Energy NGO. She had a Master’s degree in education, and her thesis focused on an eco-feminist approach to science education. Asked to be a research participant, she accepted the request, but rather wearily, remembering her previous experience of being interviewed during which she had found it emotionally hard to bring back memories and talk about them.

Like many other interview participants, Han showed an interest in the purpose of my study and the use of teacher interviews. Still at the initial stage of the study at the time, I could only give her a rough idea about my interest in teachers’ own perspectives about environmental education to examine or critique current ways of defining environmental education. She asked, “So, you will also address *the aims* of environmental education too, right?” I have come to ponder what this question means. I think this was a crucial moment in our conversation which changed the way she

spoke about her experiences, and the way I engaged with it. It was about adding a critical dimension to the amplexness of her experiences by which both of us became able to become more deeply engaged with teachers' consciousness of what it means to deliver environmental education, namely, a self-understanding about the question of "What to teach as a science teacher".

As a leader of the group with many years involvement in various activities, Han was interested in how to make things happen or how to bring about change. What she found "interesting" about the way things work in the teacher group lay with the ways in which the members reached agreement in the process of developing and designing STS materials "without vigorous debate" or argument. The teachers used to convene and study the sociology of science. This was a new area for them as science teachers, but provided the background knowledge and perspectives for understanding the value-laden nature of scientific knowledge concerning biotechnology or environmental issues. For her, the study of this area "fitted" with the "progressive" perspective that she supported and had pursued since university. However, she felt it rather "interesting" the other teachers without those "backgrounds" could still be actively engaged with the group's activities. She remained reticent rather than judgemental about the teachers' different perspectives that may contradict her own point of view, especially when it came to political orientation. What she firmly believed was that "value issues" were something she wanted to address in teaching, and this was the way she could live up to her "worldview".

I have been engaging in the STS group with a couple of science teachers. The idea was put forward initially by Dr Kim who was a former colleague. Although there are some criticisms and dismissal of the ideas of STS, I believed in its potential. Recently the group published one book that deals with how to teach value issues through science. This kind of activity may not be too promising or attractive because people don't easily find it interesting or fun. In addition, one may challenge its legitimacy as science education even though we are convinced. This sort of content is neither compulsory nor straightforward to teach. So it is very hard to encourage teachers to develop an interest in this, although I believe it should be taken seriously. The number of members of the group remains more or less the same, and we don't expect we would bring a phenomenal success or anything beyond routine activities in the future. Among us, there seems a considerable difference in terms of our backgrounds and interest. For example, it is not true that all the teachers are politically progressive. But it is very interesting that serious debates or conflicts never occur when it comes to decision-making processes on the orientation of the teaching materials. It is probably because we are not used to sociological thinking, and so, tend to take a less critical attitude toward the knowledge of the sociology of science. I don't think

this is desirable, but it seems understandable given that we are all learners and not experts.

Did I think it was a progressive idea or an absolutely vital thing to do? Well, either way, I believe it led me to realise there is some room for manoeuvre in that I can teach something different. Earth science needs a sort of holistic insight or knowledge of humanities compared to other science subjects, when it comes to the history or trends in the changes of the earth and nature. Up until this point, it is analogous to those of society. The textbook addresses the history of earth science as briefly as a few paragraphs, but I extend it into two hours to give pupils the idea that science is flexible and subject to changes. Before then I had taught only the theories and knowledge. The current development process in the National Curriculum in no way considers teachers' own views. In fact, teachers don't like to teach just as it mandates. I used to ask myself, "What indeed should I teach in the earth science class?" The situation is even harsher in high schools because of the university entrance exam. I dislike finding myself cramming knowledge for examination, repeatedly saying to pupils, "This is very important, so make sure you memorise it." What am I doing? This is the most difficult part in teaching. What should I teach? Personally I am interested in teaching about alternative energy. The conventional approach tends to put too much emphasis on energy saving, whereas it is more crucial to transform the forms of energy, and to raise awareness that renewable energies are attainable.

How many colours do you think that environmentalism divides into? [Researcher: sort of rainbow colours?] Well, my colour? Would it be grey? I'm radical in thought, but not so much in behaviour. In my opinion, sustainable development is nonsense, and it is 'their' plot, so to speak. All those agendas (including sustainable development) only serve 'their' meaning. Thus, I wonder whether we have any more options other than destroying all current civilisations and going back to the past. I mean the only thing we can do might be to consume less, and live less materialistically. On top of this, we must consider feminism and spirituality, etc. But I can't make clear what kind of colour this is. I don't know. However I am certainly keen to work with people. Work proactively. Once problems are identified, I am very quick to respond and grapple with them to find solutions whereas others may want to ponder them over for a little while. Then, I aim to make things happen, considering people's capacity and role. The National Education Information System (NEIS)²⁵ was a big issue lately, and I was furious about the idea and I thought science teachers must take this seriously since it raises an ethical issue concerning personal

²⁵ The NEIS is a governmental administrative system and service that connects schools, local educational office, and the Ministry into one network, which met a severe objection from Teachers' Union and other civil sectors due to personal information security issues.

information. This is when I act rather firmly. I want to act once I am convinced that it is meaningful.

Looking back, I believe environmentalism coincided with my worldview that I developed through my student movement experiences. I realised this is the very thing that I wanted to teach about. I can say it was sort of a personal breakthrough as a teacher. What kind of science I should teach, rather than how I teach, has been my main concern since I started teaching. Then I happened to know Dr Kim and entered into the STS field. I took it on board, working on it seriously, and it extended into a value issue, as it became central to the work of our group now.

- Han, "I took it on board."

The idea of "progressivism" is a recurring theme in Han's attempts to make sense of the origins of her passions for STS education. She was awakened to social justice issues at university. When she became a teacher, a relatively privileged profession, she was afraid she might lose a cause and her activist burden. But because of Dr Kim, who introduced her to an STS approach, she was able to continue her orientation in science teaching. With her clear advocacy for political progressivism, she was able to give a critical appraisal of the 'sustainable development' discourse, and some other environment- and science-related political issues. Thus, even before the stem cell research scandal was revealed, she had "observed" the troubling ethical issues concerning egg extraction, and with colleagues, had developed teaching materials that dealt with this. She was also concerned about a younger generation whose cultural experiences were different to hers. For example, those pupils who lived in a less privileged background seemed susceptible to an uncritical acceptance of a neo-liberalist social order. She also saw young teachers of my age leaning toward "liberalism", by which she meant apolitical and individualistic stances²⁶.

But Han's advocacy and orientation tended to unearth challenges about how to put this into action. She wanted to have more confidence and a strong sense of belief about what she held to be important things to do. Recent engagement with the NGO activities on alternative energy education signals her endeavours to do this, which convinced her to believe that "there are solutions" through

²⁶ It might be asked whether this concern arose out of Han's leftist disposition. While it might be the case, the generational difference in Korea has in fact been a hot issue in recent years, in terms of the prevailing economic conservatism among young people, famously termed the "880,000 won generation" – an equivalent term to the 1,000 euro generation in Europe, who are propelled toward "winner-takes-all" battles by the increasingly neo-liberalist dominance over the economic and social order in Korean society (Woo & Park, 2007).

which a more sustainable society could be achieved. At the last school festival, members of the Solar Energy Club had successfully showcased rice cooking through solar energy. In teaching environmental issues through her science class, she realised it is very difficult to motivate pupils to think critically. Knowing how hard it is to make things happen, she was ambivalent about being able to make clear the “colour” of her activism (in paragraph 4). As her stories of ‘action’ continued, the idea of progressivism is dressed in multiple colours.

❖ *Kim’s story: ‘ideal’*

I knew Kim by his paper before I met him. He was a member of the Green Education Study Group in the EE Group. Reading the paper in which he discussed the principal ideas of ‘green education curriculum’, I got the impression that he would be a ‘theory person’. He recalled the first time that he came to be interested in environmental education. His colleague once said, “The environmental problem is a matter of economics.” He did not understand what he meant by that; however, it motivated him to study “intently”. His approach to environmental education was rather “theoretical” or academic, compared to other teachers, such as the art teacher he knew, who took an “emotional” approach that aimed at nurturing creative expressions and feelings about nature.

Kim drew on Kant’s aesthetic philosophy (“*Critique of Judgement*”, 1790) in reflecting on deep consciousness, as the sort of “origins” of his disposition for ecological thinking. His early childhood in the countryside might have affected the formation of this consciousness, which remained dormant until he realised it, but he saw it as corresponding with the implications of Kant’s theory. He believed that the mindset and consciousness that children these days have is fundamentally different to that of his generation. “Ecological education” or “green education”, terms he used interchangeably, should aim at restoring or nurturing the very fundamental consciousness of sense and sensitivity. But he realised that his knowledge was limited and superficial as he engaged in more activities including research projects, and thus he decided to get a Master’s degree.

He recognised a growing interest in environmental education in schools. At the teachers’ conference last year, environmental education was one of the biggest sessions. He and the members of the EE Group put forward an ‘ecological perspective’ as one of the principles of an ‘Alternative Curriculum’ which was currently being debated by the Teachers’ Union. The discussion on the Alternative Curriculum began with the criticism of the 7th National Curriculum that was introduced in secondary schools in 2001, and despite a lack of in-depth research, he saw this

process as an opportunity for raising teachers' awareness about the need to re-direct the school curriculum towards ecological education.

Yet when it comes to 'teaching', it takes so much effort to substantiate his theories. As a science (and physics) teacher, he opined, the key principle for teaching is "not to be deceived into" believing false and ugly science. Scientific knowledge and research cannot be value-free. Other teachers may criticise his idea, saying, "How can you say this as a science teacher?" For him, that was just patent "ignorance" of modern physics that proclaimed the principle of uncertainty, as formulated by the German physicist, Heisenberg, in the Copenhagen interpretation of quantum mechanics. Likewise, environmental education is not about (in the conventional term) science education, but about "worldview".

I address environment-related topics in science class. A sort of hidden curriculum if you like. The curriculum can be taught differently depending on the teacher's interpretation. But pupils might get fed up or complain, wondering how it's related to science if it comes up too often. The major aim of science education should be, I believe, to enhance the capacity to see through illusions. There're public delusions or misconceptions about scientific knowledge, promoted especially by the media. Since only a handful of pupils will become scientists, school science should focus on general scientific literacy, and crucially, address meta-perspectives on scientific development. EE seems to get growing attention at school. Old teachers show keen interest in school farms or Buddhist eating practices. But I do have a clash with teachers, sometimes. It's a matter of worldview, in the end. I doubt younger teachers would be different. The current teacher examination system has resulted in a reward-driven teacher culture. They don't ponder value issues.

Personal interest and focus areas seem to diversify among EE teachers. I'm keen on theoretical knowledge rather than outdoor education, for example. I grew up in the countryside, and I had this vague memory in nature, playing with my brother, surrounded by these bright, fragrant azaleas in spring. I couldn't make out the strong feelings this memory brings until I came across the ideas about sense and sensitivity as fundamental sources in developing environmental attitudes. I realised the inexplicable feelings I experienced might be the very origin that led me to environmental concern. In recent years, I've attempted to develop theoretical work on ecological education. And I decided to start a Master's course this year, realising I need to structure my ideas into academic work.

In the days when the student movement was powerful, individual difference was still

apparent in the spectrum of participation and political ideologies. In fact, I didn't feel I belonged to any of the extreme positions. As I have deepened my thoughts through a good amount of reading on ecologism, I can now figure out why I was reluctant to be deeply involved in radical actions at that time. It was at best an ideology of hero worship, I could argue. But then what about ordinary people who are not that brave, just like me? Speaking in my own defence, ecologism did seem to imply a compromise between those strong ideologies, the Left and Right. However, the greatest thing about it is it empowers ordinary people when they join their efforts, little by little. I believe environmental education can be empowering this way. One of the old prejudices against environmental education is the tendency of extremism. People dismiss the efforts by challenging, "Probably that's a good thing to do. Then, are you intending to go and live in the countryside?" or, "Am I evil since I have a car and use a shampoo?" But I believe consciousness-raising is up to ourselves, that is to say, we can make changes, however little, if we really want to do so. Little changes can become enormously powerful when brought together. Environmental education would impose a sense of guilt if it aims for too ambitious an ideal. Just as old Leftists thought, as if we could create a utopia once we got rid of the enemy. But this is destined to fail. Rather, we need a vision with small steps so that people can feel it is doable. In my view, the first step can be initiated by nurturing ecological sensitivity, which then may help people change their behaviour and ultimately participate in political action.

Since I am a teacher, my teaching practice must substantialise this idea after all. It certainly takes a good deal of effort to be able to have confidence. Ten books might end up with just one idea for teaching. It's a long and slow process. And the tricks are, pupils are not supposed to notice that I'm talking about something very different, but think I'm doing my job. This would be one of invaluable qualities for what takes it to be a teacher, however, it's just so hard!

- Kim, "This is my ideal."

Before I met Kim again for the second interview, I listened to the interview recordings to prepare questions, and got the impressions that his voice sounded strong and resolute, but not very self-critical. I wondered whether I could encourage him to become aware of this narrative style. At the beginning of the next interview, I cautiously commented that I wanted to know more about the origins of his strong belief and passion. Unexpectedly, he was rather modest by admitting that he knew he sometimes spoke "too strongly", and this style wasn't instructive to pupils who are gullible, who are not always capable of being critical of what he says. This self-critique was a relief

to me. I was then able to take a more critical attitude throughout the interview process and in understanding the interview texts.

In repeated readings of the interview texts, I began to capture some elements of an idealistic discourse. Ironically, his strong narrative style seemed to effectively reveal the gaps and the dialectics between his “theories” and action. His approach to self-study was theory driven and reading based, which in turn provided him with some knowledge and understandings for making sense of his past experiences and to develop his arguments (e.g. nature experiences in the childhood and student movement experiences). But to the extent to which the ideals that theories aim to achieve cannot be always congruent with reality and experience, his advocacy and argument seem to be subject to the criticism of being impractical. His interpretation of past experiences in the outdoors and in the student movement was driven by his knowledge about ecological philosophy, which is an ongoing subject of study, rather than well-established. Thus, learning to realise this gap and to apply the ideas to teaching, beyond gaining theoretical knowledge, is “slow” and “painstaking” as he admitted. Will Kim’s “theories” develop in a way such that more critical re-interpretation of experiences and practices may follow?

5.3. Stories of vision and ‘environmental education teacher’ identities

The storytelling process during the interviews intended to involve teachers in reflectively thinking about their self-images concerning what kind of teacher they were in the past, they are now, and they want to be in the future. ‘Critical stories’ with recurring remarks on orientation, disposition, taste, and personality that teachers tended to attribute to the fundamentals of their motivations for sustaining environment-related activities represent teachers’ narrative strategies for achieving correspondence between their lives and career, and between what they want to do and what they can do. Understanding the narrative construction of identity in this way shifts us into looking at the ways in which people constantly engage in a hermeneutics of experience, where they go through challenges and try out actions. In this respect, this section discusses the significance of narrative devices with which teachers’ stories unfold a sense of continuity as a feature of identity building or the pursuit of an identity, through the notion of ‘vision’, in understanding teachers’ environmental education.

As described in 5.1, teachers’ narratives were presented with a main plot and the storylines in teachers’ narratives, through which the teachers (and the researcher) attended to sense-making

processes concerning how teachers' self-concepts emerge, develop, or might be transformed through their interpretations of environment-related experiences. The notion of 'vision' was not only a core theme here, but also a useful heuristic in looking at the ways in which narrative threads are integrated into a plot.

Among the five teachers, the stories of Han and June feature a more coherent pattern in weaving their personal and professional experiences into narratives of environment-related teaching that exhibit stronger support for the reasons why they are participating in environmental education. Both of them had a strong belief and sense of political advocacy that became rhetorical resources in justifying their perspectives on, values in, and enhancing skills for, environment-related teaching. But the ways in which they expressed it were unique: 'progressivism' and 'taste'. Han's progressivism seems to be a prime motive for action. She remained ambivalent in making clear what this idea of 'progressivism' is about (paragraph 2 in the box), and what 'colour' of environmentalism her view supports (paragraph 3 in the box). But she was able to associate this motive with her action-oriented personality²⁷. In contrast, for June 'taste' represented her individualistic character in the styles of her action. And it was often used to differentiate her personal and professional values from others, including EE teachers (paragraph 4 in the box), other science teachers who tend to have a naïve view toward science, and a general culture of teachers. Thus, themes such as 'progressivism' and 'taste' became the cause for continuing environment-related activities.

In contrast, for Young ('learning') and Lee ('compass'), their teaching narratives were not very elaborated in that their recognition of limits and constraint were more obvious. Young's voice was cautious, and often confused when she attempted to reflect on her own ideas about education and science-related environmental issues. Lee was more self-convinced of his environmentalist identity; however, he recognised he became a 'shadow person' rather than actively engaged with environment-related activities. Meanwhile, Kim's narrative of an 'ideal' exhibits the gaps in his thinking and action, and thus, his teaching narratives are imbued with a sense of irony: of both conviction and confusion.

In such ways, the narrative devices for weaving the narratives exhibit a sense of continuity for action in teachers' identity projects through themes like 'learning', 'progressivism', 'taste',

²⁷ The NEIS case (paragraph 3, in the box) illustrates this, but other episodes include her attempts to get used to using environmentally-friendly cotton-made sanitary towels, and discussing this with teacher colleagues, which brought about not only an interesting discussion but also a cynical response from one male teacher colleague. Through such episodes on 'other teachers', her style of action came to be understood more clearly.

‘compass’, and ‘ideal’. These stories of vision were thus imbued with a strong sense of teachers’ reflection on the teaching profession. Finding a “compass”, as Lee put it, is a compelling metaphor. Young’s story also brings into focus a sense of growth as a learner when she deepens her reflections on her past teaching experiences and personal life, as she likened them to a “formula”, a guiding rule that led to conformity in her life decisions and attitudes in the past. Indeed, for many teachers, talking about how they came to be engaged in environmental education invoked reflective engagement with alternative and sometimes competing histories of their teaching careers, and this in turn can help them re-interpret their present environment-related experiences in light of a future-oriented sense of vision. Such storying of deep self-understandings illuminates the constituted realities of education in their own lifeworlds where they often face problems and tensions, and ‘succeed’ or ‘fail’ to overcome them. In this, social and cultural norms and institutional rules that work upon teachers’ identity constructions are exposed at the point of teachers’ own self recognitions, providing them with opportunities to evolve their stories as they reflect on or resist them. Understood this way, stories of vision are stories of ‘action’ that teachers can choose to live by, acting to maintain or re-awaken teachers’ sense of agency and identity.

In this respect, a notion of vision needs to be understood in a more holistic sense: teachers’ sense of vision can encompass their personal *and* professional identities, although the pursuit of one might not be congruent with that of another. But stories will be retold as life goes on, acquiring new meanings or becoming the ‘fictions’ we live by (Gough, 1999). Thus the idea of vision can be understood as a metaphorical heuristic, in that it guides teachers into thinking about and ‘planning’ what they wish to do to be a ‘good teacher’. It is in this sense that we can assume that life and narrative are mutually constitutive (Ricoeur, 1988) in the way one (in)forms the other. In telling their visions of education, environmental education, and their lives, what can be facilitated is teachers choosing to act and live up to what they have just told. In this process, teachers’ narrative identities are constructed as they engage in giving “an answer to the question of who you are”, which entails “an ethical engagement” and “an act of the will” (Verhesschen, 2003, pp.454-455, based on Ricoeur, 1988). Here, an organising metaphor of “vision”, or indeed, “compass”, alongside (re-)interpretation processes, can facilitate ‘narrative invention’ in generating a sense of continuity in a life (Bruner, 2001, p.28). In other words, teachers’ ongoing endeavour to match their lives with a progressive sense of vision is the key to understanding formative narratives.

Understanding teachers’ visions in this way, their implications for environmental education can be discussed in terms of the idea of an ‘environmental education teacher’. To begin with, what becomes clear as each narrative develops is how environment-related teaching is deeply implicated (with)in the individual teacher’s life contexts and opportunities, e.g. common to four of the

teachers, except June, was meeting influential teacher colleagues. Teachers' life stories present ways in which teachers aspire to develop a sense of the 'good teacher', rather than accept the category as being socially imputed, as a role and set of responsibilities, that addresses ideas and perspectives related to the environment. At the juncture of both tensions and formative influences the diversity of environment-related teaching practice emerges, and we find a difference in the notion of environmental education teacher identities. For example, Young's story gives significance to reflective learning processes, i.e. "teachers should learn to do...", while Lee's story does so normatively, i.e. "teachers should do environmental education" (whatever the definition is). In common, teachers' thinking cannot be understood without recourse to stories of their identities reflexively constructed.

Hart's (2003) narrative inquiry into teachers' thinking in environmental education echoes this in emphasising a sense of 'care' at the core of teacher identity formation. The analysis in this chapter emphasises the ways in which teachers' sense of continuity for action emerges through telling their 'vision' of lives and career. Arguably the heart of such an analysis lies with teachers' narratives of the forming and transforming of their 'beliefs about self and the teaching role' amongst other dimensions in the conception of teacher beliefs (Calderhead, 1996), while previous studies of teachers' beliefs about environmental education (see 2.2.1) have focused on pedagogical beliefs and orientations (e.g. Cho, 2002; Cotton, 2006). Indeed, the study's main question related to teachers' environmental education - "Why do teachers engage in environmental education?" (see 1.1.1) - became central in understanding the nature of teachers' environmental education in terms of their identities: taking environmental concerns and issues into account in envisioning their personal and professional future (cf. Figure 2-1).

In this, four of the teachers' narratives (except Young's) display how significant events such as the student movement and democratic changes in Korea, as four teachers experienced them, acquire retrospective meanings by facilitating teachers' sense of continuity and theories of action, e.g. through 'preserving' the significance of the event as it was to them in the past. Indeed, we might argue that those cultural histories did play a part in shaping teachers' vision and environmental education, which can be differentiated from Hart's (2003) study in a Canadian context (see 4.2.1). While capturing this interplay between individuals' stories and 'larger' cultural narratives helps understanding some 'characters' of teachers' motivation for action and environmental education and their vision, we also note individual teachers' different interpretations of their experiences, either in terms of point of view: Han's progressivism and Kim's ideal, or personal identity: Lee's "conviction" and June's "feeling right", which seems to have become part of their ongoing

endeavour to define teacher ‘professionalism’ by seeking other meanings of being science teachers (see 6.2.1).

How then does such a focus on teacher identity enable an understanding of environmental education? We can elaborate the notion of vision with a view to comparison with other discourses of teacher identity. For example, Estola *et al.*’s (Estola, Erkkilä & Syrjälä, 2003) narrative study of Finnish school teachers brings unique ways of story telling into view via the notion of ‘vocation’, which is often in conflict with other discourses. The initial idea that understanding teachers’ narrative identities with a notion of vision other than anything else originates from the ways in which teachers give significance to the impact of their encounters with environment-related ideas and practices, such as “breakthrough”, “compass”, and “guide”, something which prompts, leads, and encourages them to continue in ongoing reflections on what teaching can be, and has to be, like. In this way, teachers’ thinking and practice in environmental education was generally about “doing things more and doing differently”, by displaying ongoing reflexivity in their practice and action. Therefore, vision narratives exemplify the ways in which teachers’ life experiences become meaningful sources of stories, the stories that enable hearing *and* seeing teachers’ environmental education as part of their identity formation and struggle by recognising and challenging the boundaries and standards in defining what it means to be teacher, and therefore, can serve as an epistemological base for elucidating the meanings of personal narratives as ‘small’ stories in terms of a critiquing role regarding surrounding, ‘larger’ institutional and cultural narratives – the theme that will be investigated through two further cases in subsequent chapters.

5.4. Understanding teachers’ meaningful stories

Having read the stories and my interpretations, how can one make sense of the teachers’ visions? They hopefully capture something of the ambiguities as well as certainties in the complexity of ideas and voices, as well as offer grounds for understanding and developing sympathy with the teachers’ aspirations, passions, senses of responsibility, and struggles in developing their own sense of vision in their personal lives and work. The reading of the stories so far represents the ‘focalisation’ of the story by the researcher. But of course, it was not assumed that this should be ‘the’ version of story that represents the implied meanings. Narration of the interview situation and subsequent reflection illustrates my attempt to write teachers’ stories in a more open-ended and contextualised, and less deterministic, abstracted way. This section addresses some entry points at which understanding teachers’ meaningful stories and their identities begins to occur through the engagement of reflective thinking on one’s own frame of reference.

It seems that my own experience of such reflective dialogue offers pertinent contexts. As briefly introduced in 4.4.2, as a way of developing intersubjective zones for the interpretation process, the discussions with two groups of students stimulated our ways of understanding the stories from different perspectives (Korean undergraduate students and fellow research students, both at the University of Bath; see Appendix 4.3.1. for further details about the procedures and contexts). The conversation with two Korean undergraduate students (identified as KU1 and KU2) illuminated our everyday-in-use frames of reference on the meanings of teachers' work and responsibility, especially concerning the culture of education in Korea. In encouraging them to make sense of two teachers' stories through the full interview scripts (Young and June, anonymised as A and B, respectively), whilst attempting to compare and contrast them in light of their own schooling experiences, I aimed to expose and come to be self-aware of some of our, often unconscious, values and perspectives that guide us to identify and interpret meanings, which may be beyond or incongruent with what the teachers intended to mean.

The students tried to grasp the teachers' personal philosophies that underpinned their environment-related teaching approaches, and commented:

Because our educational system drives an all-in approach to the university exam (the teachers must encounter difficulties in the realities.) ... Are these (teachers' approaches) called 'alternative education'? It must be very difficult to implement this idea. To be honest, I think it is rather risky. They must be very brave. I can say they are doing the right things because I am a university student now. If I were their students, I might be worried if learning in this way would help. (KU1)

In such ways, the students began to make connections with teachers' stories and their own thinking and experiences, through which themes such as the exam-driven educational culture, teachers' inertia in relation to trying innovative pedagogical methods, and the effectiveness of teaching in comparison with private tutoring, emerged. From my standpoint, the students' comments were distinctively evaluative. Indeed they often tried to make judgements on the teaching approaches, and teachers' values and attitudes, by putting them into the binary concept of good/bad teaching. For them, the teachers' commitment and unique approaches to environmental education felt "impressive" and "extraordinary". However, responses such as awe and praise were accompanied with the stereotypical categorisation, through which a rather normative discourse of the teacher's role and responsibilities stood out. This is understandable given their dominant point of view in reading the stories, i.e. as students. In fact, through our discussions, the students exchanged their

opinions and suggestions on how teaching can become more imaginative and innovative in ways that meets students' needs.

The teachers' narratives in this chapter purposefully focused on teachers' 'personal' space where teachers' embedded experiences are told, in making the case for teachers' life experiences as a legitimate source that contributes to sense-making of environmental education (see 4.4.1). For the students, this way of telling teachers' stories seemed to be unfamiliar but gradually understandable:

KU2: I thought that the purpose of the interview was about what teachers think and do in relation to the environmental issues, but there seemed to be some digressions in conversation.

Researcher: Digressions?

KU1: To my mind, talking about them (teachers' everyday life contexts) was to do with (exploring) what teachers' mindsets would be like... in terms of teachers' real life experiences...

Researcher: For the interview, I did not assume that ideas about environmental education would be fixed, and wanted to listen about what teachers think and experience. And this led to the broader perspective of what we talked about teaching.

KU2: Both teachers [Young and June] seemed to pursue ecological lifestyles. It would be good if they can bring these ideas into classroom teaching. Food, bazaar, recycling, stuff like that.

In contrast, fellow research students' interpretations seemed to naturally include teachers' life contexts into their understanding of what environmental education means to the teachers. 'Significant life experience' (see *Environmental Education Research*, 1998, 4(4)) was the main theoretical frame brought to bear in that particular interpretation process. These discussions often focused on identifying the personal and cultural resources that motivated teacher participation in environment-related activities in their personal and professional lives, by attempting to trace some trajectories that would enable teachers to weave the formative narratives. In a way, this process also provoked the discussion on the Korean cultural situations that both enabled and limited teachers' initiatives towards taking more radical action. But it was noticeable that there were no easy ways in understanding teacher identities, and this was evidenced by the discussion on the title of each individual teachers' stories, on which agreement was hard to reach.

This elusiveness in crafting teacher narratives seems to offer a reflective context in narrative inquiry. Theoretical frames that researchers implicitly or explicitly hold may lead to the image of teacher subjectivity as entirely conscious or the claim that we can access consciousness directly through narratives. In fact, some science teachers' overt identification of their preferred educational view with the ideals of a STS (Science-Technology-Society) approach or a 'critical' perspective, seem to have an affinity with a particular theory of environmental education (Robottom & Hart, 1993). Indeed, during the discussion with the research students, as students of this 'research field' they often strived to figure out what teachers meant by 'critical' as this was a recurring word, as in "critical eye". But understanding teachers' 'critical' perspectives seemed to require us to think 'beyond' theoretical frames and categories. This was because, although the phrases that included the word 'critical' seemed to penetrate some of the 'essences' in teachers' personal philosophies that underpinned their practices, the term was also conceptualised differently in teachers' narratives and among the teachers. For example, it encompassed a teacher's embodied insightful knowledge and perceptiveness (Young), a pupil's capabilities for critical thinking on science issues (Young, June), and a teacher's political disposition to social justice (June).

In such ways, the processes of reading the stories and sharing ideas through the discussions recognised 'identification' as a crucial part in 'understanding' teachers' stories. Even though we do not have full access to teachers' thoughts and practices about environmental education, and therefore teachers' stories are bound to be re-interpreted through our own frames of reference (i.e. theoretically and experientially), the process engaged us in revealing and further examining our own frames and preconceptions about what teachers do and who they are. In relation to this, one of the Korean students commented:

I might have believed that what teachers do is just teaching. However, reading these teachers' stories, maybe because they are enthusiastic about their work, though, I noted many dilemmas they're recognising. In the case of A's [Young] story, she mentioned she felt "puzzled" about the mismatch between how school education imposes such a naïve idea of morality, and how society actually works – then this may puzzle pupils too. She was confused about what she has to do. I felt very sympathetic with her at this point. (KU1)

Probably it is this 'sympathy work' that can lead us to find better ways of understanding teachers' stories. In this vignette, the student could identify with teacher A [Young] in thinking about the rift between the naivety of school education and the harsh reality of society. As a student of our education, he primarily read the stories from a pupil's point of view; however, he also became able to see that behind 'normal' teaching and learning practice as he experienced, there are actually teachers who have dilemmas and get confused, just like everybody does in their lives. Whether or

not he and others as readers agree with the teachers' perspectives on education and environmental education, some truths of stories can still be pursued through searching for identification at a moment that "rings true" to them (Blumenfeld-Jones, 1995; see also 4.4.1).

To conclude this section, understanding teachers' stories as something meaningful for teachers themselves entails engaging stories authentically and ethically. While the work of understanding teacher identities is necessarily inconclusive, we can understand the various ways in which teachers develop their own sense of environmental education teacher identities, and this can blur the boundaries of the teachers' roles, imposed by culturally dominant models of good teacher and theoretically driven frames of interpretation.

Indeed, the process of, and the journey into, becoming a teacher who is concerned about the environment and who incorporates this concern into his or her teaching, involves a complicated process of learning, through which his or her own way of teaching begins to shape (up) professional identities, and characterise their curriculum repertoires (the themes that will be further developed in Chapters 6 and 7) in ways that create cracks and ruptures in school education. This is a fundamentally personalised version of vision that they gradually, but also instantaneously, become aware of in the course of their life trajectories. June's story illustrates this well as she keeps her distance from "other" teachers and teacher groups. With vision being characterised as individualised, not shared, as far as its boundary remains within a group of like-minded teachers, it implies the possibility of conflicting stories rather than complementary ones in their actual teaching practice. This requires a careful reading 'between the lines' of utterances charged with emotions, particularly those associated with hesitation, uncertainty, and concern, in order to understand other dimensions of teacher story – that is, institutionally based, curriculum stories. It is in this vein that the next two chapters develop an investigation into discursive practices, in which teachers' stories and their personal narratives of teaching practice are critically examined in connection with the institutional context of schooling in Korea and cultural narratives of the environment.

Chapter 6. Arguing for teacher professionalism: good teacher or odd teacher?

❖ Chapter introduction

Through the stories of vision in Chapter 5, I described teachers' sense-making of their environment-related experiences as relating to personal theories of action and a sense of continuity in one's own life. Whereas this approach to teachers' stories illuminates the formative characteristic of autobiographical narratives, through a holistic understanding of a 'person' and his or her life, fragments of a life that comprise the actualities of the everyday context denote that meanings of being or becoming someone depend on a particular discursive context. In Davies and Harré's (1990) terms:

We take on the discursive practices and storylines as if they were our own and make sense of them in terms of our own particular experiences. The sense of continuity that we have in relation to being a particular person is compounded out of continued embodiment and so of spatio-temporal continuity and shared interpretations of the subject positions and storylines available within them. How to do being a particular non-contradictory person within a consistent storyline is learned both through textual and lived narratives. (Davies & Harré, 1990, p.59)

It is in this vein that the analysis in this chapter illuminates another 'location' of teacher narratives, or a particular discursive context - the institutional context of schooling in Korea, by developing an analysis of argumentative narratives that exhibit various scenes and modes in ongoing identity construction processes that teachers get involved in as a sense-making process of their professionalism - the 'environmental education teacher'. The chapter consists of three parts, as follows:

- Argumentative narratives for analysing teachers' identity construction processes;
- Three cases of narrative analysis: science, humanity, and Environment teachers; and,
- A discussion on environmental education teacher identity.

6.1. Argumentative narratives and professional identity construction

6.1.1. Argumentative feature in identity talk

Since I am a teacher, my teaching practice must substantiate this idea after all. It certainly takes a good deal of effort to be able to have confidence. Ten books might end up with just one idea for teaching. It's a long and slow process. And the tricks are, pupils are not supposed to notice that I'm talking about something very different, but think I'm doing my job. This would be one of invaluable qualities for what takes it to be a teacher, however, it's just so hard! (Kim, Kim2; also in 5.2)

When environment-related experiences become formative sources for a teacher's vision and personal theories of action, how do teachers actually develop and maintain professionalism? While to connect 'environmental' to 'education' or in Kim's word, to "substantiate", involves teachers doing things "more" and doing "differently", it also means further attending to reflexive professional identity construction processes by engaging possibilities for action and praxis. Kim's story of the 'ideal' in 5.2 seems to suggest gaps between theories and actual teaching. But what else do teachers' stories of dilemmas and struggles 'do', or 'mean', particularly in terms of teachers' professional identities? For example, how 'permissive' are teachers' environmental identities to their science teacher identities? While identities are not directly "read off" from stories, they seem to help account for some forms of narrative characteristics and styles (e.g. Mill, 2001), and teachers' self-understandings as environmental education teacher were identifiable in relation to four major themes:

- Sense of identity, individual ('me') or collective ('us');
- Images and stereotypes attributed by, or to other teachers;
- Images and stereotypes attributed by pupils; and
- Teacher culture in schools and in the Korean context.

In this, narrative analysis drew upon the perspective that storytelling can be viewed as taking part in 'identity work' (see 3.2.1) in ways that particularly make visible identity talk as evincing a discourse of (not) belonging, similarity and difference (Barker & Galasiski, 2001). More specifically to matters of identities and identity construction, such themes bring attention to the ways in which teachers identify (embrace) or dis-identify (distance) with available identity positions in the everyday institutional context of schooling, as represented by images or stereotypes, or that are distinguishable through a sense of belonging in making sense of what they think they do

and who they are by doing “more” things and doing “differently”. In this, teacher narratives were not just formative but also distinctively ‘argumentative’, in that their rhetorical features are imbued with a sense of arguing and/or persuading oneself and others of some goal, case, or claim, for example, in attempting to answer the question, “what should science teacher’s environmental education look like?”

MacLure (1993, p.316) also identifies teachers’ identity claims as a form of ‘argument’, “as devices for justifying, explaining and making sense of one’s conduct, career, values and circumstances”, through which diverse argumentative identities are produced, and where ‘opposition’ rhetoric is often a prominent feature. In other words, teachers’ argumentative narratives appear to exhibit various sense-making tools and elements that are necessary for answering the question of “what does it mean to be/become an environmental education teacher in the current educational context in Korea?”

With this assumption then, I introduce some examples of narrative segments that illustrate more directly argumentative features of narratives. Some codes of transcription were devised in order to deliver contextualised meanings:

- () are used to refer to my addition of the words to contextualise the meaning.
- (()) are used to mark my description of the event in talk, e.g. ((laugh))
- [...] are used to mark the deletion of the words because of the irrelevance in the current context of interpretation.
- [] are used to refer to my description of the conversation context, or my question or comment.
- Italics are my emphasis, while underlining is used for teacher’s emphasis.

Also, excerpts were reduced from original transcripts to a more compressed form to serve the purposes of interpretation. When the interaction between the researcher and the teacher(s) was more active in producing shared meanings, the narrative segment is presented as a form of dialogue. The following excerpts are examples in each theme, which will recur in the continuing sections in this chapter.

Sense of self-identity

As was the main focus of Chapter 5, engaging in environmental education entails mobilising aspects of a teacher’s ongoing personal identity project:

I was not familiar with this area (environmental education). I hadn't thought about it before. I just seized the opportunity when it came to me. But I didn't think (at the time), "This is it!" People might be just easy to influence, or some people would get curious. Or, they might say, "That's not my interest." Anyway, I probably had an impressionable mind, and I carried on so far. It was something that impacted upon my way of thinking, and now I know how important it is. I wouldn't give up on it, because it is about the fundamentals of human lives. (Lee, L2)

In the case of Environment teachers, reflections on what would be the essence of the environment subject – the identity of the subject are noticeable:

[Commenting on the marginalised status of the Environment subject in schools] But all we can do is, in the end, do our best in the place where we work. [...] Now it is 6 years since the curriculum was introduced, the teacher's career in total on average is only 3 years. It is too short a period of time to establish the framework. Then we just need to carry on. So I believe that the future depends on the in-service teachers, although the adoption rate is still significant to stabilise the curriculum in schools. Therefore, it is down to our efforts, our professional capabilities. (Nam, F1)

This 'group identity', or sense of belonging is also evident among other subject teachers in projecting their own images into the group identity to different extents:

At first sight, I don't appear to look like the colleagues in our group. Their personalities tend to be soft, not radical. (Kim, K1)

I joined in our group when it was in bud. 'Let's do something... even though we don't yet what it is going to be', that was the spirit. And gradually things have grown and become clearer. [...] Now, they might want to work on their own in their schools without belonging, and actually there are teachers who individually work. (Lee, L3)

Other teachers

Notions of identity are represented not just by self-understanding or belonging, but also by differences among other teachers, e.g. in the following, other science group teachers, and teachers who are not interested in environmental education, respectively:

I don't agree with a 'Fun Science' approach. How could science be just fun? But of course, I respect those teachers' passion. (Kim, K1)

{In the context of school ethos including other teachers' attitudes toward environmental education} I am more like a defiant type, whereas XX is trying to be more persuasive. But the thing is, people (Environment teachers) don't want to be bothered to talk with the teacher sitting next to them. I don't want to talk to my colleagues about why we need environmental education. However, there seems to be no other way than convincing teachers. My point is, we shouldn't need to persuade teachers why we need environmental education in schools, but other teachers would know if I work with conviction by myself, or whether I am satisfied with my teaching. (Sue, F1)

Then, 'collaboration' among teachers appears to be the key to successful curriculum practice, but constraints are evident:

I make the full use of discretion as much as I can. Then I sometimes skip some content in the textbook, if I think it is okay. But a problem occurs when I share the curriculum unit with other teachers. In this case, we need an agreement. At my previous school, the teacher and I were a great team, and we taught the whole year class. So, it was possible to teach on our own plan. Teaching differently, or changing teaching topic is impossible without collaboration with other teachers. (June, J1)

Pupils

Teachers' concerns about pupils' responses to environmental education, either favourable or stereotypical, are observed:

I don't do any environment-related activities in my club. Students don't usually have a good image about an "environmental club". It seems to me that 'environment' invokes moral duty, or suggests things you have to do although you don't want to do. Like some sort of "ethics textbook". (June, J1)

It was rather after I became a teacher that I realised I've got to work really hard. It was because of the pupils. Their expectation on 'Environment teacher' was huge. "She would do something different", sort of feelings. (Yun, F1)

The problem is that kids these days don't like outdoor activities. They seem to be so used to sit all day playing computer games. I almost have to pull them along. (Hong, H1)

Teacher culture

To envisage a more supportive ethos for environmental education in schools raises fundamental

questions concerning teachers' attitudes and mindsets, and the teacher culture through which ideas and aspirations about professionalism can be shared and nurtured:

When I became a teacher, my hope was to become able to say, "This is my theory of education," in front of junior teachers when I turn 40. (Kim, K2)

Environmentalism is about self-consciousness. They have to think what's going on first. The ways of engagement or commitment will vary. But then, the mindset will gradually change. There would no few junior teachers who from the outset would say, "I'm an environmental education teacher." (Lee, L3)

I used to fight against the principal when I was younger. But now I would advise young teachers not to fight. Campaign for it, but don't fight against. It doesn't mean that you become docile. But it is about doing two things. Firstly, move people's minds, rather than persuade through logic. Secondly, try to learn more since you've just embarked on the career, and therefore you have a long way to go. (Min, M1)

Briefly introducing the main features of the three different teachers' groups, the science teachers' stories displayed various modes of identification and dis-identification as they attended to sense-making about the 'good teacher' and teacher professionalism as science teachers, and hence featured various argumentative characteristics and rhetoric styles. In contrast, in the two humanity teachers' stories, these dynamic processes were less notable, in that 'environmental education teacher' identities were more easily taken up, while the Environment teachers' narratives also displayed identity work processes in ways that suggested struggles with paradoxical demands. Prior to detailed analysis of the teacher narratives of three groups, the next section demonstrates the ways in which a teacher engages in reflexive identity work through examples from Han's case.

6.1.2. Reading ambivalence

One immediate feature of the argumentative narratives illustrated above is that the process of 'social categorisation', e.g. norms and moral rules that comprise the 'proper' teacher, or 'science teacher', is not always recognisable nor are the boundaries of its operation fixed. In fact, personal narratives are basically more concerned with a teacher's own point of view and "Who am I?"-type questions; thus they do not necessarily display cultural and social processes *per se* that are more structurally involved in the constitution of teaching practice as confined by the teacher's 'role', and which hence make identity construction as much a macro as micro process (see 3.3.2). Therefore, it

is important to remember that narrative analysis can appear to stress the more ‘active’ aspects of identity construction and various modes of identity negotiation through social interactions, rather than any deterministic characteristics of particular discourses.

Also, crucially, considering a teacher’s identity work as the activities through which the teacher engages constantly with discursive practices through everyday social interactions in schools, it must be noted that a teacher’s subjectivity, or a property of being a teacher, cannot be totally fixed; therefore, the analysis is concerned with specifying the modes and processes involved in ‘construction’, rather than attempting to pin down categories of environmental education teacher identities. In this view, my interest lies in understanding ways in which discursive spaces are formed within the discourse of teachers, in the ways that teachers envision their professional identities in order to do “more” things and do “differently”. In other words, what new or other meanings of teacher identity and professionalism appear through teachers’ identity construction and negotiation processes?

In this, the inquiry needs to scrutinise discursive practices in which dominant discourses and cultural knowledge come into play and are (partly) evidenced in teacher’s narratives, or may otherwise (wrongly) represent (simply) ‘personal’, ‘enthusiastic’ stories. This perspective seems to be well supported by examples of ‘ambivalence’ in the teachers’ argumentative narratives. Ambivalence was notable in Han’s narratives whose science and environmental education could be easily regarded as that of exemplary teaching or the radical teacher: it refers to the coexistence of ‘critical’ and ‘moderate’ voice tones (also in Appendix. 4.1.2).

Our school was one of the so-called ‘model schools of environmental protection’. But the school took all the trash bins out of the classroom to reduce garbage, and then distributed plastic bags to pupils and forced them to take their own trash home. Such violence! I thought it gave only bad impressions of environmental education to pupils - such a tighten-your-belt ideology!

Positioning her teaching subjectivity in opposition to a conventional role that serves an outcome-driven educational ideology, and persisting with an “action-driven” style in her own words (also in her story in Chapter 5), Han generally maintained a strong, sometimes radical voice in advocating her teaching approach to values issues and criticising traditional environmental education. However, this sharpness was toned down when it came to the more general ethos in the culture of teaching:

It is very *interesting* that we've never been so keen on debates, examining our own ideologies, never. [...] A *funny* thing is there's even one person who has never studied the sociology of science before. (Han, H2)

Nobody seems to disagree with the idea of environmentalism. When I talk of animal rights, vegetarianism, they usually mumble: "Yeah, you're right. I see your point." But here's the thing: nuclear energy, "It's indispensable, and absolutely safe!" Their voice would get stronger. Then, it's likely to become a dispute. On that issue, many teachers object to me. *After all, I just accept the difference.* (Han, H1)

These are her comments on the teacher colleagues in the study group and in the school, respectively. When she acknowledged a prevailing silence rather than an active debate on environment-related issues, even among like-minded teachers ("we"), let alone a hostile response in the everyday school context, her voice took a more moderate tone by using the qualifiers such as "interesting" and "funny". She might have to refrain from judging the perspectives of colleagues by insisting that she is right, while still making clear her own position of advocacy, especially about the importance of teaching alternative energy. In this way, the shifting of narrative voice seems to suggest an acute moment in the discursive practices where the teacher's point of view may collide with others, for example, on probably culturally and institutionally more acceptable or favoured ways of thinking about and implementing education. While the tension in voice makes it difficult to pin down Han's identity to explicate her passion and professionalism, ambivalence seems to show that even the teaching practice of an experienced teacher like Han is bound up with contradictions in professionalism, roles, and norms.

It should be noted that ambivalence is not as visible in other teachers' narrative voices as in Han's. Indeed, teachers' voices can be characterised differently according to the utterances that display a teacher's unique rhetorical styles or ways of producing argumentative identities. For example, as addressed in 5.2, Lee and June appear to be very contrasting in their voices: modesty vs. assertion. However, what matters is not how strong the voice is, but what kinds of rhetoric appear by managing contradictions.

In Han's case, her story proceeds with her active involvement in the alternative energy NGO and the teachers' STS group where she constantly gains the sources of learning and professionalism in developing the curriculum for earth science teaching. It is through this richness in experience that she felt like she achieved a "breakthrough" (in her words), by pursuing the answer to the very fundamental question about teacher's work, that is, "what teachers should teach":

[H1]

Researcher: What do you find most challenging in engaging in environment-related activities?

Han: About what to teach... I mean, since the curriculum was not introduced through the consensus with teachers... But they (teachers) don't like doing given things. What should I teach at my earth science class then? [...] This is the most crucial issue to me.

Researcher: The teachers' group should be helpful then?

Han: Sure. I feel I need *agreement* of the members, since I can't entirely feel *conviction* by doing things alone.

Han's struggles and obstacles are still evident, but in her story they appear to be the very sites of identity work through which she pursues a sense of "conviction" that she does the right thing, living through the contradictions. Based on the perspective that teacher narratives display ongoing identity work processes by managing contradictions and pursuing teacher professionalism, the next section presents three cases of narrative analysis, as examples of possible dynamics and features of becoming/being environmental education teacher in the everyday institutional context of schooling in Korea²⁸.

6.2. Arguing for teacher professionalism

6.2.1. Good teacher or odd teacher? (five science teachers' stories)

❖ *I am (not) odd*

I can say that we are people of *anti-perspective*! ((both laugh)) (Young, Y1)

[K1]

Researcher: What do you think makes you keep engaged in those activities you talked about so far?

²⁸ In presenting teacher narratives to serve the analytic purpose, choice of extracts was inevitable; however, interpretation sought to ensure a comprehensive reading and maintenance of an holistic understanding.

Kim: Hmm... Maybe we are always... we tend to be critical of *mainstream* views. I am the kind of person who cannot say “no”, and am always busy. But I think that more fundamentally living in the mainstream in our society often troubles one's *conscience*. Probably it's got to do with my personality. I want to make things happen.

Both Kim and Young's vignettes illustrate how teachers often distinguish themselves or more collectively, like-minded teachers from other teachers, in making sense of their engagement in the environment-related activities that are beyond those mandated as the teacher's role. During the interview, both Young and I laughed since we knew that 'anti-perspective' is not the kind of word that Young would use frequently. But it was also true that the STS group members (“we”) can be regarded as “anti-perspective”, especially when a big issue such as the stem cell research scandal illustrated that their views were in the minority in society and among teachers. Likewise, Kim also distanced his 'disposition' from that of other teachers, and the stories were illustrated with episodes about some teachers in the school who appeared to be eager for a managerial career position:

Perhaps I cannot say it is the 'reason', but there seems to be a certain 'disposition' that leads to a teacher's lack of motivation (for environmental education, or doing things differently). It's about their dispositions after all. It seems to be very difficult to change one's own disposition as an adult. Good learning opportunities then are vital. For me, I had some excellent experiences, and especially people around me were absolutely powerful influences. I met lots of amazing people since I began teaching. Although they appeared to be ordinary, I learnt so much from them. (Kim, K1)

To him, environmental education (which he often terms “green education” – see 7.2) is about forming those dispositions, and not just about science education. It also became his ideal for education. But then I challenged him:

[K1]

Researcher: But then it is science that you teach, isn't it?

Kim: Science is a hobby to me ((laugh)). But of course, I can't study science just as a hobby. Studying science needs professional training, whereas it seems easier to study other areas by myself. So, I think it is a relief that I trained as a science teacher. That's my *justification*.

Indeed, whatever a teacher's ideal is, a teacher's thinking must be put into teaching if it is to be real.

[K1]

Researcher: What kind of activities do you do at school?

Kim: [...] I address some science-related issues through my teaching. They call it the 'hidden curriculum'? The curriculum can be taught differently by teacher's interpretation. That's how I add issues. But they shouldn't be too many. Because... pupils might get fed up, or complaining, "What is he doing at science class?" So, I should be careful. ((Both laugh))

Researcher: You need some sort of trick?

Kim: That's it.

Here we can notice that his vision of education meets and collides with pupils' expectations of what science teaching is to be. The actual teaching practices are mediated by constant effort, such as a trick to re-package the intended curriculum as the "hidden curriculum". His use of the term 'hidden curriculum' is interesting, given that its academic use typically refers to the particular function of public education that is more than just transmitting knowledge through the official curriculum but maintaining dominant social values through a socialisation process (Jackson, 1968). Indeed, his appropriation of the term reverses the power relation between the state and teachers by stressing the teacher's ownership of the curriculum, and can suggest a sense of interpellation rather than socialisation in discourse. However, there is another meaning attached to the word 'hidden' in the following sentence when he addresses pupils' possible resistance, i.e. "What is he doing in the science class?" Thus, to achieve the goal of teaching that is directed toward critical scientific literacy seems to demand that he takes a more "careful" attitude, by making his messages "hidden".

[K1]

Kim: Teaching is about what can be actually taught, at the end of the day. [...] Telling the same stories all the time can't get pupils' attention. Good lesson planning is essential in substantiating ecological ideas through teaching. A good deal of reading and thinking is required in this. Even to talk about one thing (topic or idea) entails reading ten books. Then, it is a slow process. [...] But it is not effective to talk about it all the time... [...] and it needs sort of control. Pupils should feel it is teaching rather than just stories or digressions. This is what it takes to be a good teacher. However, it is so hard!

Researcher: It seems it needs lots of effort?

Kim: Precisely. Moreover, these days there are various versions of textbook. So the teacher has got more things to consider.

His tone of voice was rather strong in attempting to argue that his teaching should be well planned and delivered. However, when it comes to the actual teaching, the use of the square brackets - [...] - here specifically refers to mumblings that indicate his difficulties in finding the right word to express his thought. His story continued with criticism of other teachers' teaching styles and learning objectives by arguing that good teaching requires constant learning, and it is not just about 'techniques'.

The style of narration in Kim's story exhibits his struggle to actualise his idea of science teaching in a way that it is well received by pupils as well as satisfactory to himself. But of course, there appears to be discrepancies and contradictions, which makes his story rhetorical. Prominently in his narrative style is a wariness of getting stereotyped as an 'odd' teacher who talks 'beyond' the mandated curriculum too often in the science class. Whether or not he takes up or resists the stereotype, it seems to make his identity work become more reflexive by arguing for and attempting to match up with the personal belief about 'good teaching'.

❖ *It's about good teaching, whether environment-related or not*

Whereas 'odd' teacher discourse represents a rather passive form of identity rhetoric, teachers' stories often display more active rhetorical styles by arguing for teachers' own ideas about 'good teaching'.

[J2]

Researcher: How do pupils like issue-based learning?

June: Er... generally, 'good' is their response. But their complaint is... it is good to learn about current social issues, and to know that science is not detached from society... but it's worrying that other pupils taught by other teachers learn more through the textbook, then they might get behind when they move to an upper year. The point is, they like my teaching style itself, but worry about examination.

Researcher: How do you respond then?

June: I would rather ask them, "Did you recall all the contents you memorised for the exam? Rote learning is not effective anyway, then it is much better to have a clear understanding about important concepts (based on issues)". Actually, there were pupils who visited me after graduation, and told me that for them, my teaching style worked quite well as they looked back, and that made a lot easier to study high school science now.

In this vignette, June was able to justify that her issue-based science teaching approach is in fact more effective than 'rote learning', by convincing herself and her pupils. June's argument seems more convincing to pupils than Kim's 'hidden curriculum' approach whereby he does not necessarily try to convince pupils; instead, he focuses on how his teaching style should look like 'normal' science teaching. It is often the case that teachers justified their teaching approaches as concurring with generally accepted good teaching methods that are not just, or beyond rote learning or content-based learning, and therefore not an 'odd' thing to do: 'It is about good or more effective teaching that counts', whether environment-related or not:

[In the context of her teaching style that encourages discussion and inquiries, Researcher: how do you teach in (not environment) science class?]

I use the same approach. In earth science (not overtly related to the environment), by using technologies or activity sheets, I try to encourage pupils to attend to the thinking process. To my mind, children these days study harder than they used to, but their academic ability is no better. I think it is because their learning style is too dependent (on teacher's explanation). (Han, H1)

[In making a contrast to private tutoring] In my teaching, pupils' presentation is the important part. If teaching is the teacher's one-way instruction style, pupils might think that they don't need to listen to me since they learnt about it at the cram school. (Young, Y1)

As illustrated in these vignettes, teachers often mentioned the problems of rote learning and private tutoring (or cram school; 'hak-won') that prevail over pupils' learning attitudes. For teachers, it is not easy to overcome this problem since pupils actually need this style of so-called 'spoon-fed' (the same expression in Korean) teaching, given the overloaded learning objectives and fiercely competitive exam-centred culture. Kang (2006) also points out this tension as a prominent pedagogic process in classroom interaction, in explaining why a geography teacher - the study's key informant - should opt out of environment-related contents that she apparently wanted to introduce.

It was not until long after I found my teaching had been upgraded. Three or four years ago... The SATIS²⁹ book was definitive. I was so fascinated. I was longing for such teaching. But it seemed to me that to do so, teachers should be able to lead class sophisticatedly. It was since after I came to be more confident about teaching and controlling pupils, and to become more knowledgeable about social issues and making links to the science teaching context. Having said that, I might as well think that a good teacher is made by the ability to deliver the knowledge effectively... so that pupils gain good scores in exams. That was my goal for a couple of years. Since I reached that level, I began to think about what to teach, and whether it is good to teach as directed in the textbook. (June, J1)

In this vignette, June recalled how her idea about ‘good teaching’ had changed. Teachers would be able to resist conventional teaching and learning methods in different ways, according to circumstances and experiences. Han’s teaching method, either environment-related or not, is based on her ideas about good teaching that sometimes go against the pupils’ study routines:

[H1]

Han: I can be quite demanding in class, trying to make pupils do something on their own. For example I use activity sheets with which pupils work on the task. They should think and write about their own ideas, and have discussions with peers. Then pupils would moan, saying, “There are no more spaces to write on!” I am this kind of teacher.

Researcher: How do you teach (usual) science?

Han: I do the same thing. [...] These days, kids seem to spend more time in studying than we used to do in our school days. However, their academic achievements are no better than before. I believe that it is because their learning method is too much dependency-based. Then less able pupils rather prefer the spoon-feeding method so that they can grasp things without too much brain work. But I would not teach as they wanted.

In fact, the teachers’ environmental education is only part of science teaching, but the idea is grounded in integrating teachers’ ideas about ‘good teaching’ in general as a science teacher. Kim seems to attempt to go further to ‘reverse’ the prevailing practices by using environment-related learning as a way of achieving the goal that a new assessment approach premises:

²⁹ “Science and Technology in Society” textbook series were published through the STS curriculum development project launched in Britain in 1986.

[K1]

Researcher: Given the various activities you have involved in so far, do you have any plans in the future, or things you want to do?

Kim: I have been interested in teaching through reading tasks in the most recent couple of years. It seems to go with the current trend in that essay writing has been stressed (as an assessment method). [...] In fact, it is really important. Since we now have performance assessment... (I want to) encourage pupils to read books or essays that are concerned with science issues, and to think about their own ideas. Also... to think about environmental values... [...] Writing seems to be very important (as a tool to express one's thought.) Not only an academic style of writing, but also short notes (can be effective). I believe that writing is a basic human activity. I am considering introducing essay writing to my science class. For instance, writing 100 words about environmental topics can be an easy task for girls since they like exchanging letters with friends. There were many instruction methods I tried before, but it seems just too demanding to create new ideas for teaching. But writing can be very effective. [...]

'Performance assessment' is a new assessment method introduced since the 7th National Curriculum, in order to diversify teaching and learning methods by mandating that a certain proportion of the assessment is qualitative, e.g. cooperative projects or portfolios, as a complementary measure to the conventional paper examination (mainly multi choice- and short answer- based). Kim seemed to consider a strategic use of this assessment to facilitate pupils' environmental learning in science classes, and importantly, in a more acceptable way.

❖ *It is not just, or beyond 'environmental education'*

When teachers' stories about environment-related teaching extend into the notion of good teaching and good teacher, teachers also attend to sense-making about environmental education - aims, definitions, approaches, contents, etc. - in ways that make conceptions about environmental education varied or ambiguous. In Han's story, tensions among the conflicting positions are obvious, whereas in Kim's story, the tensions are used to support his thoughts:

[H1]

Researcher: It seems fair to say that not all teachers are interested in environmental education. Do you ever talk about environmental education with colleagues in the school?

Han: Well, this is the thing. Nobody would object to environment(-alism) and environmental education, right? So, there is no conflict about it. There is this all-of-sudden well-being trend too. I recently read “Animal Liberation” by Peter Singer. How horrendous! It was really shocking and I have talked about the book to teachers. At the time I was also interested in vegetarianism since I never really liked meat. Talking about this, everybody seemed to give credit. (continued to nuclear power issue at p.201, in 6.1.2)

[K2]

Researcher: How do you think other teachers see environmental education?

Kim: Well, the responses are generally positive. The typical activities at school will be gardening: growing tomatoes etc. or field trips to streams, and so on. I can say, environmental education is in fashion recently. It attracts quite a lot of interest from teachers. Maybe it is because teachers don't know much about what to do. Sometimes I help them find some educational materials. There was an NGO's “Empty Plates” initiative that was developed from the Buddhist practice. I gave the programme instruction to the teachers who were interested. Since senior teachers are keen on eating habits, they find this programme very educative.

In recognising that environmental education was gaining currency in schools, Han and Kim seemed to have observed how other teachers or pupils get on with the languages and practices, through “typical” or topical activities and issues such as well-being and health. In this way, teachers' perceptions about environmental education or environment-related issues, values, and behaviours present ways in which teachers selectively take up available meanings, in making sense of what can and should be regarded as educational approaches. The following vignette shows one straightforward rhetorical style in ways that environmental meanings are negated by a stripping of the ‘labels’:

[J2]

Researcher: Have you been to Cheonggyecheon?

June: Yes. I just passed by the other day.

Researcher: How did you like it?

June: Cheonggyecheon? I see it as a big artificial pond.

Researcher: Lots of people seem to visit there in such cold weather lately.

June: I think it is simply anti-environmental. ((both laugh)) To be most generous, it might have some aesthetic values as far as it is not covered by concrete anymore, and water can flow now.

Researcher: I found it worrying. Since it was advertised as an ecological restoration...

June: That's my point. That is why we need a 'life-cycle' approach, to make the invisible visible.

Researcher: I thought what if they ran an 'environmental education' programme there?

June: Then, it would be just about knowledge – knowing some names of insects, stuff like that, only except that it takes place in outdoors.

'Cheonggyecheon', the stream flowing through the downtown of Seoul that has been covered by concrete, but recently uncovered and restored after controversy (see Appendix 4.2.3), seemed to be very interesting subject matters for questioning what it means for something to be of environmental value. We both criticised the ecological images that it seemingly stood for. Moreover, June was able to make a case for "life-cycle" approach to teaching about environmental issues that considers any related environmental processes and consequences, by "mak(ing) the invisible visible". Furthermore, outdoor programmes in Cheonggyecheon appeared to be void of meaning in that neither 'environmental' nor 'educational' values can be justified. Indeed, uncritical use of 'environmental' 'education' worried her:

I am very concerned about the economical dilemma that seems to be central to organic food issues. I say to pupils not to eat junk food because it's not healthy. However, when pupils want to buy some snacks at school, for example, the choice will be limited because of the pocket money that pupils get. So, I need to say more than telling them what is healthy or unhealthy. Furthermore, we can't always put environmental value at the top of the agenda in every single matter. People have their own priorities that may butt up against environmental values. If too much emphasis is placed on the environment, pupils may end up with a negative perception about it, complaining that we can't do anything because of the environment. We can't help but make a compromise at some point. (June, J1)

June seems to embrace the idea of healthy eating as providing opportunities to address environment-related issues. However, its educational meaning was only partially valid without

further examination of the political economy of agriculture and food production. When a health issue is reduced to making a right choice, the value of education is only given through the frame of pro-environmental behaviour, i.e. the “ethics textbook” approach:

I don't do any environment-related activities in my club. Students don't usually have a good image about the “environmental club”. It seems to me that ‘environment’ invokes moral duty, or suggests things you have to do although you don't want to do. Like some sort of “ethics textbook”. (June, J1; also in 5.2)

Not all teachers expressed as highly critical or even negative concerns about ‘environmental education’ as June. But June’s strong voice appears to well represent the manner in which meanings of ‘environment’ and ‘environmental education’ are subject to contestation, and as such, illustrates how more spaces can be created that teachers can fill with their own terms and arguments, rather than regarding either as incontestable. Given the flexibility and contestation of meanings that are available to the terms ‘environment’ and ‘environmental education’, in both response and contribution to debate, teachers’ identity work is likely - indeed might be expected - to take place, and continue, given the open-ended nature of the concepts.

❖ *This is (not) my priority.*

But then, what kinds of meanings do science teachers generate in such open discursive spaces? Teachers’ views, knowledge, and their teaching focus vary, as the discourses of scientific literacy and the role of science in society produce multiple positions that science teachers can and should take (see 2.3.2). While Chapter 7 will develop perspectives on teachers’ diverse ideas and experiences in terms of curriculum repertoire, what was most prominent in the teachers’ rhetoric was the various extents to which they maintained distance from those other approaches to science teaching that are usually more popular among teachers and pupils, in making sense of their own views and priorities.

The next vignette was extracted from the very first interview situation in which my questions led Han to make sense of how her earth science teaching evolved in ways that consider environmental issues as a ‘natural’ subject matter:

[H1]

Researcher: How did you come to be interested in the environment?

Han: Since I started teaching... when my interest in environmental issues began to grow up...

Researcher: Was it a natural thing to do?

Han: Hmm.... Because I was teaching about the environment at times... Perhaps, it was a very natural thing to do.

Researcher: But not all teachers do so.

Han: Would it be then because I thought that I had to be progressive?, or "Oh! This is absolutely crucial!"? Hmm... Well, I certainly felt that it gave *room* to talk about other things than formal knowledge about science.

Researcher: Would science teachers want to teach scientific knowledge, or awaken pupils' curiosity about science... how amazing science is? *Aren't these different, from your view?*

Han: *I don't have those 'amazing' scientific facts.* ((my laugh)) I don't really feel that way, teaching science. Nothing feels new any longer. Having said that, earth science is concerned more about a sort of holistic insight into things than part of things which biology, chemistry and physics seem to be concerned with. In fact, earth science does not give clear-cut answers. It tends to say, "This is what we know about how things have been so far." Changes in nature are not clear-cut. So, in some sense, it has affinity to social science or history.

This dialogue illustrates the first instance of where I noted that the use of opposition helped teachers to make justifications of why and how their preferred teaching approaches were useful and necessary (e.g. Earth science vs. other science subjects, her pedagogic priority vs. 'Fun Science approach'). Other teachers tended to express a more overt oppositional rhetoric, of which 'Fun Science' is a prominent case in point:

There are many chemistry teachers in the 'Fun Science' group. They argue that if it is not fun, it is not science. But how could science be just fun? I don't agree with that. But of course, I deeply appreciate those teachers' passion. However, it is subject to a value-neutral view of science. My point is that science is not objective, but value-laden. Those teachers should be able to think about this. (Kim, K1)

We have one teacher at school who is the member of the group. Since it is about (science teacher's) professionalism, I would feel a little bit jealous. He is a chemistry teacher and

works really hard. What his shows look brilliant, and that's it really. I say, "It does not seem to apply to biology?" But then he goes, "No! There are many things you can do in biology too!" ((Both laugh)) So... for me, *it is not my thing*. [...] I think it makes teaching as if it was performance. (Lee, L3)

'Fun Science' approaches can be broadly understood as a specific teaching method that prioritise pupils' interest and concerns as the key factor for effective learning, in ways that go beyond traditional theory- and concept- based learning. Such an approach can be named differently, but I used the term 'Fun Science' because teachers in the study often pointed to the 'Fun Science' teachers' group as representing the pedagogic approach. In fact, as a pedagogic approach, it is beyond the group's initiative, as it is broadly shared in terms of good science teaching practice (KICE, 2002; see also 4.3.2 and 7.3.), in particular, in order to enhance the affective domain of learning that Korean students have scored poorly against in international assessments, TIMSS - Trends in International Mathematics and Science Study (KICE, 2004). In these vignettes Kim and Lee pointed to a science teachers' group (called "Fun Science") that has been active in developing and practising new teaching approaches. In spite of different tones of voice, oppositional views are clear in both narratives. Young and June seemed to use slightly different rhetoric:

I am also interested in 'Fun Science' group. But I am not very willing to join the group because I have heard about the group becoming too big and demanding teachers to produce visible outcomes. I don't want to have that pressure. The things I am doing now are teaching at school and my family... and the STS group... *these are enough for me*. Their group's activities... they are little bit demanding for me. (Young, Y1)

I sometimes give a change in learning objectives. For example, as a service for the pupils who are not really studious, or enthusiastic about science, I would do an experiment. The learning objective then will be just fun. But some other times, I say at the beginning, "Today's class is for able students, so don't get frustrated if you don't understand well." ((both laugh)) (June, J1)

Rather than opposing the idea itself, both teachers seemed to recognise the potential contribution to science teachers' professional development and pupil learning, despite difference in their sense of competence in the actual implementation. However, both teachers seemed to embrace the idea only partially. Young was able to see the problems of such an outcome-driven approach, while for June, the idea was taken for strategic purposes, not as a priority in itself. In this way, comments on Fun Science serve a rhetorical purpose in making clear a teacher's own priority or advocacy:

Frog dissection is the case. In fact, I did dissection this year (because it is mandated), even though I disliked doing it. I can't agree with killing living animals. But in the training course, I learnt the alternative method: cow eyes. They say that eyes are the only part that is discarded. I actually enjoyed the dissection. Up to this point, some aspects are useful for pupils' learning in a particular age group. But I still believe that value issues should be considered. (Kim, K1)

The 'Fun Science' group seems to stress how to teach effectively. It seems to me that they don't ponder issues about *why* we should teach. [...] (Instead) I stress the question of "What is a scientific attitude?". I even say to pupils, "Don't believe in everything I say, and don't believe in the textbook, either. Instead, ask questions." The experiments in the textbook are rather like cooking recipes. In my class, I often instruct pupils not to open the textbook. Then, I begin with a question, "How can we solve this problem?" Especially in the case of introductory sessions (to topics, concepts, etc.), I teach without the textbook for two or three sessions. I ask one question, and get pupils to talk about their own ideas, just like brainstorming, if you like. (June, J1)

In these vignettes, Kim and June illustrate their own advocacy for particular pedagogical priorities: value issues and scepticism, respectively, in ways that make evident that which is not their priority. It is through this rhetorical feature that teachers' conceptualisation of the contribution of environment-related teaching to pupils' science learning appear, such as an "STS approach" (Han and Young), "science and value" (Han, Kim, June, and Young), and "critical eye" (Young), all of which suggest that science teaching should consider the social embeddedness of science and scientific knowledge.

❖ *A brief conclusion*

In this section, four main rhetorical features in science teachers' narratives illustrate teachers' sense-making of their environment-related teaching approaches, why it is important and how it contributes to pupils' learning. Through the reflexive process of *embracing/distancing*, e.g. prioritising pedagogic approaches, and *clarifying/blurring the boundary of ideas*, e.g. good/odd teacher, science teachers' environmental education illustrates an engagement with a dynamic identity work process in ways that create discursive spaces for teacher professionalism, i.e. how 'permeable' science teachers' professional identities are to environment-related teaching.

6.2.2. Wearing an ‘environmental’ badge (two humanity teachers’ stories)

In this subsection I present two humanity teachers’ stories, with respect to their experiences of outdoor education. Owing to their rich experiences, they were known as ‘environmental education teachers’. Provided that the two teachers’ stories are presented autobiographically as in 5.2, codes of transcription are not used in this section.

❖ *“I am just like those environmental folks” (Hong’s story)*

Hong is a history teacher who has engaged in outdoor education. He was the most experienced of the eleven teachers, with twenty-four years’ teaching experience.

It was about ten years ago that I became involved in outdoor education. For a long time, I was in charge of pupils’ safety and behaviour when we were on school trips. After I resigned from that, I wanted to do something related to outdoor activities. Since other teachers were already in charge of leading clubs like Boy Scouts, Girl Scouts, and RCY (Red Cross Youth), I didn’t seem to have many choices. Moreover, other clubs like Marine Boys, Space Explorers... I didn’t have expert knowledge in such areas as a history teacher. Then I happened to go to the Green Scout teacher workshop, and I became involved with that since then. In terms of organisational structure, the Green Scout programme had more adult members than other Scouts, and the teachers in the group used to work together through the ‘Green Net’ network. But we encountered many problems, and the ‘environmental’ title seemed to confine the activities we could do. So, we changed into Korean Youth Union, and are now engaging in other youth-related activities as well as environmental activities.

When asked to tell his environment-related experiences, Hong’s story began with a detailed account of the history of the NGO that he is currently engaged in. As illustrated in this vignette, his narrative in general displayed more ‘descriptive features’ than other teachers’ narratives. In general, his story tended to focus on ‘activities’: what he has done so far, or “projects” as he often called them³⁰.

³⁰ In fact during the interview in the staff room in his school, as our focus moved along the activities he used to engage with, he often stopped talking and started to search around the related materials on his computer and desk, such as programme materials, administrative documents, year plan sheets, and so on. He also invited me to the first general meeting of Korean Youth Union, which was due to be held in a few days.

I was the key person in developing the Water Diary Initiative. The project was initiated by the city council, and it was my idea that the council decided to distribute the diary to every single pupil in Year 4 in all primary schools in Seoul. I was also involved in developing education programmes in the environmental establishments, since civil servants knew little about education.

Indeed, his experiences seemed to be very wide-ranging: as a leader in the group he had many opportunities to work with other educational and environmental authorities as teacher representatives. He also won an award from Seoul city council for his achievements.

But the problem now is that there are not many new teacher members. Here is the thing. If the teacher works for this kind of activity, he often has to sacrifice weekends for no rewards. Well, 'reward' sounds a bit awkward. Winning an award from the authorities might be the most recognisable one. So, the teacher should genuinely like doing it. As for the current members now, I expect that we all would continue until we retire, since nobody has quitted so far.

It seems to me that I just like outdoor activities and doing things with kids, rather than I am particularly concerned about environmental issues. If teaching at school is all I do, it must be so boring. But then, since outdoor activities are environment-related, I find it educative to observe that pupils become more engaged with environmental issues.

When I asked him about what he thought made him stay engaged in such various outdoor programmes, his accent seemed to be on more 'outdoor' activities than the environment-related. It was also linked to his experiences as a history teacher:

Before I was engaging in Green Net, I led a cultural heritage club. We used to go to fieldtrips during school vacations. I also enjoyed leading other school trips. The problem is that kids these days don't like outdoor activities. They seem to be so used to sitting all day playing computer games. I almost have to pull them along.

As the story continued with the different content of the activities, the teacher's own beliefs and perspectives became less visible. Asked about the educational aims of outdoor programmes, he stressed teachers' self-motivations and passion, and how important these were to keep things happening, rather than clarifying any particular perspectives that shaped the programmes as more educational or relevant to environmental issues:

Since it is about the environment, our focus will be on conservation side. But it seems that making any conclusions on environmental issues (development or conservation) seems to be more complicated, although we tend to stress conservation bit to pupils. Among the teachers, we often ended up in debates. But I am just like those environmental folks. I would support the conservation side.

What does he mean by “those environmental folks”? There would be wide-ranging groups and positions that can define such an identity. His focus on supporting a conservation side is one of the possible positions. Compared to science teachers’ rhetoric in arguing that “it is not just, or beyond ‘environmental education’”, which shows critical appraisal of the meanings of ‘environmental’ ‘education’, Hong’s identification with “environmental folks” seems to suggest his professional identity being more comfortably defined as that of an environmental education teacher.

❖ *People call me “environmental education teacher”.*

Min is an art teacher with seventeen years’ teaching experience. Whereas Hong’s outdoor education focuses on taking pupils outside the school fence, Min’s is on how he changed the school environment. As I mentioned earlier in Chapter 4 (see p.134), his story can be easily read as a short autobiography, including the vivid depictions of different geographical and cultural scenes in the different schools in which he worked.

My first school was located in the island. In there, it was pricey to send rubbish by ship, so I became interested in recycling, then the environment, naturally. I had a fantastic time in those days! I taught a small class, and we had so much fun. To me, it was great to have a mountain just nearby. Then I moved into this city where I have been working ever since. The environment was totally different, and kids were so much keener on academic achievement. I felt that kids here were far too lacking in sensitivity, and then began to take them outdoors. I started a wildflower class and made a darkroom in the school to develop photographs. Thinking back, this was the time I worked most hard as an art teacher. Then I moved into a newly opened school in town, surrounded by the apartment buildings forests. The place was so bleak, and even the playground wasn’t yet built. So I thought, “Change the school environment!” where pupils spend their most time, rather than take pupils outside.

Some teachers in the study knew Min as an environmental education teacher. Recently he published a book, titled “Toads in the rice field”, which was chosen as one of Outstanding Books by the Ministry of Culture and Tourism. He has also been writing a column in a teacher magazine.

He was currently leading a community-based group³¹ with colleagues at the EE Group and with environmentally concerned community members. Small-scale rice farming was one of the main activities that members were devoted to. Min argued that farming should be integrated into education in that securing staple foods is the core sustainability issue for future generations in Korea. His book aimed to bring attention to those issues, and in this way his interest could widen beyond “ecology-related” outdoor activities.

I am not a radical activist or something. On some issues, I am so confused that I can't decide my position. I believe that environmentalism is not a religious faith. There is no such 'right thing' that lasts forever. We have to make best efforts to make the best decision. We have to respect different points of view, and listen to them. Some teachers would be too impatient. I would say to them not to get so anxious about changes, but to make every effort so that people are moved from their hearts. Looking back, I was blessed to have such valuable experiences.

To have “people moved from the heart” is his ideal and he thinks this is an important mindset for teachers who want to make changes in schools. He must encounter barriers in making changes in the school, and moving people from the heart seems to be the practical wisdom gained throughout the experiences:

One thing good about working in a high school is that nobody is concerned about whatever I do. They are only interested in test scores. I was able to do everything, digging everywhere. Yet, it was different in middle school. Because I am a member of the Teachers' Union, they kept watching me if I did some odd thing, and I had to obtain an official approval for doing anything. I hate that process. I rather like doing things on a whim.

We need to ask more philosophical questions about why we think environmental education is necessary. It is not as simple a logic as everybody should be an environmentalist. Just like I don't expect that all pupils will become artists through my art class. I believe environmental education is fundamentally about making kids' lives happier, not just individually, but also collectively in the society and for the earth.

One teacher in the study called Min “infectious” in that his passion for environmental education has spread out in the school and community, inspiring young teachers and contributing to the

³¹ The interview was conducted at the group's meeting place that is open to anybody in the community, and at the time of interview, two primary school teachers were “hanging around”, sometimes joining our conversation.

accreditation of environmental education. He was being recognised as and called an “environmental education teacher.”

❖ *A brief conclusion*

In contrast to the science teachers’ stories, teacher professionalism in the humanity teachers’ stories appears to be less in tension with their subject teaching. Hong’s focus was on extra-curricular outdoor activities and his work outside the school, while for Min, integrating environmental topics into art class does not entail many dilemmas. The fact that both teachers apparently brought ‘recognition’ to their schools might contribute to their environmental education becoming more acceptable, and the teachers are well positioned in schools as environmental education teachers. Therefore, argumentative features in both narratives were less notable, and teachers could wear an environmental badge as their professional identity. Indeed, oppositional rhetoric, teacher isolation or stereotypes about environmental education, seldom appeared in their narratives. But then, does this mean that they sit comfortably in the school with an environmental title? Probably they do; however, given their rich and diverse experiences of environmental education that span almost all the years of their teaching careers, wearing an environmental badge appears to be hard worn, in that it requires individual teacher’s devotion and self-motivation. The next section considers whether this applies to all the teachers in the study.

6.2.3. Beyond survival (Environment teachers’ stories)

The analysis in this section was developed from the focus group interview with four Environment teachers. They were all fully qualified Environment teachers having passed the teacher examination, unlike most Environment teachers who changed their subject with or without training experiences (see Table 2-3). Four Environment teachers were invited to the interview. The focus group with the Environment teachers aimed at generating a shared sense of teacher professional identity through accounts of and reflections on their own teaching experiences. The fact that the four teachers had already known each other for a while through the Environment teachers’ meetings and collaborations helped the dialogue become mutually supportive and reflective. While some questions were used to initiate the dialogue, teachers were encouraged to talk, exchange and interrupt freely. Some narrative features representing the four categories of narratives in 6.1.1 suggest the distinct storytelling process and stories generated through the dialogue:

- *Sense of identity, individual ('me') or collective ('us');* both individual and collective senses of identity seemed to be better captured with the word 'vulnerable' while a sense of growing confidence and competence was also noticeable.
- *Images and stereotypes attributed by, or to other teachers;* three categories of 'other teachers' were observed – 'exemplary' environmental education teachers, 'unsupportive' other teachers, and 'powerful' teachers.
- *Images and stereotypes attributed by pupils;* more straightforward responses and comments from pupils, e.g. 'oasis' metaphor.
- *Teacher culture in schools and in the Korean context;* while collaboration/individualisation is the key concern in other subject teacher's narratives, to take root their own professional status in the existing teacher culture and system, "ethos" was considered as the priority in the collective concerns of the Environment teachers.

These narrative features can be indexed to the 'ontological' status of these Environment teachers: that is, as 'new comers' teaching a low status subject. Also the fact that the four teachers' careers were as short as 2-3 years seemed to add to their stories being less assertive and the prevalence of more vulnerable voices. Collective storytelling of their everyday lives as Environment teachers created the unique storyline of 'survival', in the way that their existential predicaments shaped their stories of teaching experiences so far³².

❖ *Surviving through the paradoxical demands*

Whereas the dialogue with other subject teachers began with my question, "How did you come to be engaged in environmental education?", in the focus group interview I initiated the dialogue by asking "How did you come to become an Environment teacher?" The stories opened with accounts of each individual teacher's decisions to take the teacher training course either through undergraduate study (Yun and Hee) or postgraduate study (Sue and Nam), with reflection on the why. A sense of the lack of conviction about the nature of environmental education was shared, given the short history of the curriculum subject (introduced since 1997; see 2.1.2 & 2.2.2). Stories about their training experience and initial teaching experiences took them further into engaging in

³² Survival stories can be further understood in comparison to vision stories told by other experienced teachers. Vision stories are the stories told in the teacher's 'personal' space in which the teacher's embodied experiences and interpretation of a sense of personal and professional identity development are woven together by means of formative narrative devices such as 'compass' and 'progressivism'. In contrast, formative elements in Environment teacher's narratives, i.e. becoming somebody/teacher, were mostly concerned with an 'institutional' space of meaning-making systems and processes, including their teacher training course, teacher examination, and actual teaching experiences.

memory work, including some special memories imbued with a sense of both enlightenment or awakening, e.g. “Wow” moments (Yun and Hee), and frustration or feeling “lost” (Nam) that would form their own expectations or self-awareness on what it means to be an Environment teacher. The following excerpts illustrate recollections of their very first experiences when they actually became a teacher:

It was after I became a teacher that I once again realised I've got to work really hard. It was because of the pupils. Their expectations of an 'Environment teacher' were huge. “She would do something different”, sort of feelings. [Researcher: From teachers as well?] Yes. It was not only because of their expectations but also because I wanted to show something. To make changes in pupils' attitudes. But it seems to require a hard process to become a *true* Environment teacher. (Yun, F1)

I was given full autonomy from my coaching teacher. In fact, Environment was not his major, thus he seemed to expect me to do very well. I didn't think it was fair, however, it made me realise how heavy my responsibility is. I thought I had really got to work harder. I studied hard to pass the teacher exam, and eventually passed. But then I found something was wrong in the school. I was *treated differently* from other teachers even though we all had the same qualification and passed the examination. I had to face the realities of academic schools. I had many frustrating experiences. It is shameful to say, but I felt I was *shrinking* more and more as time went on. (Hee, F1)

Both teachers mentioned how the expectation from pupils and teachers foregrounded their primary responsibility: to be a ‘true’ teacher. Among the four participants, Yun was the only teacher who worked at a middle school where a teacher's pursuit of autonomy can receive more support than at high schools. She in fact found her school ethos very supportive of environmental education as opposed to other teachers' experiences in their schools. Hee's “unfair” experience during her teaching practicum when she was given full autonomy (unlike the usual practices in which the student teacher work closely with his or her coach) might be just the beginning of the stories regarding how environmental education is perceived in schools. Environment teachers' predicaments are not in doubt, given the low status of the curriculum and the general school ethos that drives teachers and pupils hard at academic accomplishment - so-called “examination hell” or “examination war”. As such, Environment teaching appears to be almost “mission impossible” when it comes to teaching high school Year 3 pupils who are just close to the university entrance exam:

Having the Environment class in high schools virtually means not to teach, but to allow free study time to pupils. ((Hee: dry laugh)) Especially Year 3 class. (Nam, F1)

Three teachers who were working at a high school had stories about the ‘Year 3 classes’, and Nam’s short comment here epitomises the severity of the circumstances which were collectively shared among teachers, while Hee’s ‘dry laugh’ expresses sympathy. Teachers’ stories proceeded with their own experiences of the ‘obstacles’ that they had to encounter in managing to work within the given condition that is in fact “stressful” (Sue), and even “distressing” (Nam) or “furious” (Hee) when the school ethos was severe and unsupportive of environmental education.

With this severe working condition on the one hand, it is the parallel narratives of the ‘expectation’ and ‘marginalisation’ on the other that can make the Environment teacher’s work paradoxical:

Environment teacher? I think they (their overall behaviour and attitudes) should be environmentally friendly. I mean... their lives should be *exemplary*... and their attitudes and philosophies should be clear (clearly oriented to environmentalism). (Han, H2)

I wonder whether there can be such an independent area as the ‘environment’. I doubt it. [...] It (Environment subject) is simply about ethics. More than anything else, it is not one of the core subjects. Pupils don’t take it seriously. (June, J1)

Teachers tend to expect that we have some kind of expert knowledge. Although we want to think about the environment beyond our profession, others don’t see us in this way. Their expectation is... “Since you majored in environmental education, you should be able to talk in depth about the environment.” However, in my mind, I feel I should learn from them. [...] I just hope teachers don’t see us as if we are so different. I think we are in the same place in the sense that we all try to take the environment into consideration, to think beyond science and (dominant) social values, as well as we haven’t got any absolute answers but we try to work out what should be done. (Nam, F1)

Two teachers’ comments on Environment teachers seem to reveal the paradox in the nature of the work of Environment teachers: while demanding “exemplary” behaviour is required, their actual status is vulnerable. In contrast, Nam’s story shows the other side of the story: a need for more collaboration with and support from the teachers who are sympathetic to environmental education. Environment teachers’ stories about other teachers who are engaged in environmental education out of their own interest, like other teachers in this study, seemed to display their lack of confidence compared to those exemplary, inspiring teachers:

I met many environmental education group teachers at the conference. Some science teachers introduced the teaching method that uses a decision-making process in addressing

biotechnology issues. When I was talking with these teachers, I felt like, "Wow... I was so narrow-minded!" I don't know how to explain the feeling clearly... But maybe we (Environment teachers) are so intent on our own position (in schools)... as if we were in *battle*... We have to *convince* pupils... On the contrary, these teachers (don't have to)... For example, there is one teacher who is interested in bird watching, he would go to the field during every school holidays... and later tell the stories to pupils... It looks natural to call him an environmental education teacher, without the need to struggle to teach something. [...] It seems there are some differences (between them and us), and it makes me wonder, "Why can't we have such an easy attitude as they do?" I don't know why but it seems for me that they think big. (Yun, F1)

There are some teachers who are interested in environmental education in my school. Interesting enough, they would come to me for help since they don't know what to do or it is difficult for them to think beyond their subjects. I believe that this is desirable. It seems for them that (teaching about) the environment is already in their mindset. In contrast, it is about responsibility and a duty for us. Even I used to feel as if I had to pick up litter in the corridor ((All laugh loudly)). That is the difference. For them they can enjoy doing things (environment-related activities). But for us it is our profession, therefore we feel it as less enjoyable. (Yun, F1)

In the first vignette, the stories of the "natural" environmental education teacher starkly contrast with "battle" stories of Yun's struggles. Sue found "the pressure to set an example in every matter" made her work more "stressful":

It seems to me that those teachers are able to talk very *persuasively* to pupils... such as "I did this, and it worked very well."... Or they are very knowledgeable since they have had many experiences. Then pupils can feel that they are *convincing*, since it is who they are in their daily lives. However, pupils don't see us this way. They would think because I am an Environment teacher, I should live in an environmentally friendly way. But if something is not congruent... for example, if the teacher has got their hair permed or dyed, pupils would ask, "How can do you that after you said it is not good for the environment?" This is how pupils see us. For other teachers, they can be competent about talking about their interest. But we have more pressure to set an example in every matter, out of our own sense of responsibility and due to pupils' expectations. In fact, it is stressful. (Sue, F1)

One Environment teacher once told me that he was afraid of talking about environmental issues. I asked why, and he said that it was because Environment teachers should be environmentally friendly from their hearts and that was how people looked at him. Then he confessed that because he did not have such a strong belief in himself, he is not confident.

He is the one who had the longest teaching experience among us. Even the experienced teacher like him feels that way, how come could I be *confident*? (Sue, F1)

Sue's feeling of being "speechless", both literally and rhetorically, gets to the heart of this lack of confidence:

[Researcher: What are pupils' opinions about Environment?] "Why should we learn this?" Some pupils ask like that, if they are in Year 3. I become *speechless* if I get this question at the first lesson of the year. But it leads to self-reflection. Asked such a question, I should be able to talk clearly; however, I am not prepared to give persuasive answers. (Sue, F1)

❖ *From surviving toward professionalism*

Then, I had to work out the reason. And I feel more relaxed recently... since I tried hard to learn... I used to visit many environmental education sites such as NGOs, or through study trips to Japan and UK. Then I realised that there are no reasons for why I was so self-doubting. I just needed to know how much I could do for pupils. I believe that if I could become brave and began to do things properly, pupils and other teachers wouldn't belittle environmental education. The belief in that a little seed can make a big difference was really self-encouraging... to the extent that I can persuade people that environmental education is so crucial for (securing) our future. [...] Then, I became well-motivated... since I am now *self-convinced* and then *I want to make people convinced. This is where I am now.* (Hee, F1)

I don't think I've got my own character. No... Instead, I rather like to look at how other teachers teach. From Yun's teaching approaches for example, I thought that some parts can work really well in my teaching. This is perhaps an occupational obsession but I keep thinking about how I can apply things to my teaching, for example when I watch films. Then, I would like to learn from other teachers' approaches by integrating their characteristics into mine. This would be my own character if you like. Then, I just need to learn more like every teacher does. Sometimes I would fail. But then the thing is I must not fear failing. That was what my teacher taught me: I shall have failures and frustrations in the first three years. For myself, I extended it into five years. So I am ready to endure frustrations and tears for at least five years... And I am not afraid of failures. Just keep trying to listen to pupils so that if they don't like my class, I should be able to say, "Sorry". *This is where I am now. Then I might be able to have some kind of a framework after all these in five years' time.* (Nam, F1)

These vignettes - stories about 'persuading myself' - present the teacher's sense of professional development in the way that the journey requires a "brave" attitude and the enduring of "failures". Hee's growing mindset as a mature teacher who "wants to make people convinced" was related to a

personal need to get over humiliation (“belittle”) at school (“treated differently”). To do so, required convincing herself that she could address the fundamental question of teaching: why (continue to) teach. Nam’s search for his own “character” echoes this (see below) and seems to be another way of building professional identity. Interestingly both teachers said, “This is where I am now”, which suggests a futures-oriented attitude.

However, Environment teachers seemed to be left to themselves in taking responsibility for developing a professionalism of their own. Their stories about training experiences were imbued with a lack of satisfaction and conviction in envisaging their career as Environment teachers. In fact, many problems in the curriculum of the training system including a focus on engineering disciplines and a lack of educational perspectives, which were imputed to be the individual teacher’s responsibility.

I am still confused about what my professionalism is as an Environment teacher. Did I really major in environmental education? (During the teacher training course) It was all down to self-study. The coursework was shallow in general, and when it goes in-depth, it is all about engineering, not environmental education. Then when I was doing the teaching practicum, I found there was a huge gap in lesson planning between undergraduate trainees and us. Theirs had everything planned in a more systematic way from the beginning to the end. On the contrary, my lesson plan had no structures. I tried hard to overcome this shortcoming, but it was difficult at the beginning. (Nam, F1)

I was very sceptical about whether these professors could teach us to be prepared as Environment teachers. Moreover, the teacher examination seemed to be more appropriate for engineering students and I doubted if it can genuinely qualify as an environmental education teacher. [...] Then, we had a new tutor in the second year of the study and he made us feel “Wow, that’s it!” It was like we began to have an appetite whereas there was this lingering doubt: “what is the big picture?” I still don’t know what it is. (Hee, F1)

Hee’s “Wow” moment did not last long while she still had “doubt” about the “big picture”. In fact, the new tutor who inspired students was the first person in the department whose specialism was environmental education. But her “appetite” was not satisfied until she personally “worked out the reason” and began to have self-conviction as her experiences grew. Her recognition of the Environment class as an “oasis” to pupils seems to suggest a practical positioning of the subject as less academic but still a worthwhile subject to teach and learn:

I found this line from one book very inspiring: teachers not only do lectures but also guide pupil’s learning throughout the year. In other words, teachers should make pupils like the

teachers and their teaching. I was like... "This is the answer!" My problems will be every teacher's problems, and I believe the more experiences I have, the more skilful I become. But more fundamentally, I need to learn how to develop mutual understandings (between the teacher and pupils). Without them, pupils just don't switch on their interest. In fact, pupils tend to see the Environment class as a sort of 'Oasis' for them. Especially for Year 3, since they study all about the same thing. But then my class is distinctive. I found that Year 3 pupils liked two approaches in particular: the one that gives them a reason to express their own views, and the one that matches up with their daily concerns. Perhaps it is because that they are in fact excluded in the learning process, and it is through the Environment class in which they can express their opinions and make decisions for themselves. (Hee, F1)

I think we need a more subtle approach to teaching. Environmental education is about value, but we still need to respect pupils' own perspectives and choices. When I taught Year 3, I emphasised to them not to have too much pressure. I said, "It's like having a taste of coffee". I would be just happy if pupils had fun and released exam stress. They may develop an interest later when they go to university or become a professional. They might find my environmental education of help. I used the Internet blog as the second classroom where pupils feel easier in talking about my teaching. I don't necessarily talk about environment-related issues. Pupils were invited to post anything that they wanted to say. Teenage girls have their own concerns. I would reply sincerely to them. Then, some of them began to speak about the environment. I don't want to impose any grand ideas or visions about their future, but I can still give some practical advice based on my perspectives and experiences. It seems to me it is so important to meet with pupils 'outside' the classroom. School is too conservative a place, and teachers tend to be very pushy. So I go in reverse. I let pupils talk freely considering that my class is the only space that allows for them to do so. Why not talk loudly when it is supposed to be 'discussion'? Of course I got some criticism from teachers. However, the thing is, this is something that pupils needs: speaking loudly, or studying outdoors. And then this (style) seems to work to gain pupils' credit on the environment subject. (Nam, F1)

Despite their efforts to become competent teachers, stories about other Environment teachers who decided to change their subject to others were frustrating. Together with a low adoption rate of the subject in schools which became more worrying in recent years with no new appointed Environment teachers in 2005, the future of the subject in the National Curriculum didn't seem bright.

Since I didn't do a minor degree I must say this is my last straw. However, I believe that a couple would decide to marry because they love each other, not the other way around. In the same logic, we are Environment teachers, not just teachers. Since we are Environment

teachers, 'environment' must be the big part in our job. At least, we should be able to say that Environment subject does make a difference in pupils' learning. Little practices can still be powerful. [...] If the teacher deliberates why he or she became a teacher in the first place, they should be able to work to achieve the purpose. (Nam, F1)

Changing the subject through in-service training might be tempting. Without a minor in his degree, Nam had no choice but to pursue working as Environment teacher. The four teachers in the study did not consider such an option yet, trying to consolidate their collective mindset and develop teacher professionalism:

To my mind, it seems to take a long time to be able to share my sources. I tend to feel a little bit shy, but once I get used to it I can show my passion. Now I feel like I can do it. I believe that other teachers feel in the way I do. At the beginning, we struggle to share something in public or feel frustrated thinking that others do better than I do. Then, as more and more people start to share, they will become more confident. This is how it happened to me. (Hee, F1)

I got phone calls from teachers since my sources were uploaded. Then, it made me rethink why I developed this lesson in the first place. In this way, I feel like I am growing. (Nam, F1)

I remember that we fought so much over whether our primary concern should be teacher quota or curriculum. It is still going on. Some teacher believed that a teacher's competence should be represented by his or her academic papers. Ideas being scattering around, there seems no way to go forward. (Nam, F1)

As a collective response, there has been an "Environmental Education Fair" in recent years and the setting up of the Environment Teachers Association. In these vignettes, teachers recounted the experiences of sharing their professional skills - "sources" with others - through various meetings and activities. However, identity - priority over status or professionalism - seems to be an unresolved issue among the Environment teachers in the paradoxical relationship between marginalisation and expectation. While status problems are seen to be beyond the individual teacher's power, narratives of 'persuasion' seem to provide ways of looking at an individual teacher's personal strategies in pursuing professionalism in their own context. In this, persuasion of 'other teachers' seems to be difficult depending on the different ethos in schools and characters of the teachers:

[In the context of the school ethos including other teachers' attitudes toward environmental education] I can be defiant and express my opinion strongly, whereas XX is trying to be more

persuasive. But the thing is, people (Environment teachers) don't want to be bothered with talking with the teacher sitting next to them. I don't want to talk about why we need environmental education to my colleagues. However, there seems to be no other way than convincing teachers. My point is, we don't need to persuade every single teacher about why we need environmental education in schools, but convince them by showing that I work with confidence and competence. (Sue, F1)

My school is generally supportive of environmental education. But here is the thing. There was pupils' environmental campaigning when the teaching was about an 'issue'. And pupils put up some posters on the wall. But since schools are generally keen on cleanliness in the school buildings, I got a complaint from one teacher. But anyway I did not care... ((All laugh)) [Nam: This is why I admire her!] Because I believed that this activity was so important. But it was also backed by colleagues. Of course, not everything goes well in the way I want it to, and maybe it is not only a problem of environmental education. (Yun, F1)

Both teachers emphasised their strong mindset in keeping the security of their work and persuading other teachers as well as themselves. However, a teacher's own strong mindset or character appears to need more practical 'power':

I felt many times some sort of restriction imposed. Once I was told by one teacher that the head of Year 3 did not want outdoor activities to happen. The reason was plain. I was so furious. They can't just say what to do to me. But then once A advised me, "Don't show your anger to him. It only makes him see it in an even more negative light. Instead, try to persuade him in the long term so that he gets to think that you are right." I thought, "This is the answer!" But then it is really difficult in Year 3. I need to strike a balance. (Hee, F1)

My experiences are telling me that we should persuade more powerful people. Otherwise, it is difficult for us as junior teachers to persuade people who have no interest since they tend to adhere to their own views. (Hee, F1)

Hee was struggling to keep her Year 3 class in spite of the teachers' and pupils' resistance. Then, she wanted to strike a balance between securing her curriculum space and meeting pupils' practical needs. However, she could not avoid the personal humiliation on her own. In fact, she found the overall ethos of the school supportive of environmental education, and it was teacher A who made the difference through his passion and achievement in environmental education. A is in fact a well-known figure in the environmental education field who contributed to the school's 'recognition' among educational administrators and even internationally. Yun was experiencing that this "easier" approach worked:

Since Environment teachers are bound to be less powerful in schools, we cannot stop this from happening. It is really frustrating. Therefore, it seems to me that what needs to be done is to show some outcomes, rather than just do one's job quietly. ((Laughs)) Win an award or write a report on pupils' learning achievement... so that the principal and the vice principal get to know about it. Thinking back, I believe that I became more confident at school since I made them "wow". Of course it is not the aim that we have to achieve. But in reality, I believe it makes things easier. Thinking in this way makes me really frustrated, though. (Yun, F1)

❖ *A brief conclusion*

The ontological status associated with their assigned professional identity as 'Environment teacher' seemed to be a definitive 'condition' in which the narratives of 'expectation' and 'marginalisation' are concurrently produced in a paradoxical way. Indeed, (lack of) 'confidence' and 'persuasion' became the organising devices for these teachers, evolving stories of survival toward professionalism by seeking to carry out personal and collective strategies that would secure their personal and professional survival.

6.3. Environmental education teacher identities and teacher agency

So far, the narrative analysis has illustrated how individual teachers engage in forms of identity work as teachers who are concerned about the environment, that primarily display the argumentative features of the stories they construct and tell about their experiences and struggles in developing a sense of teacher professionalism. While the narratives are distinctively concerned with individual teachers' voices and self-understandings, their own ways of constructing identities also reveal a sense of the normative practices of teaching and the paradoxical demands that circumscribe and confine teacher stories of environmental education.

This perspective is far from representing teacher agency as heroic or extraordinary, as is often preferred in the public narratives of education on the role of teachers. Newspapers, for example, are one of the media³³ through which public narratives of education are constructed and circulated.

³³ As the focus of analysis lies in teachers' stories and how they can be understood for educational possibilities, the presentation of the media stories is limited to the extent to which it is relevant to the discussion led by the analysis of the teacher narratives in the previous sections; therefore, the full development of a media analysis is beyond the purpose in this section.

Although the societal aspirations and demands for school education are often a complex of incompatible values and ideologies, media stories do not always reveal those complexities and paradoxes which condition teaching and learning practices. A brief review of newspaper articles on school environmental education in Korea will serve to illustrate the ways in which the idealistic discourse of the role of school education is produced through the storyline of problems and resolutions.

The media popularisation of the idea of environmental education in the mid-90s in Korea was related to key major national and international events: for example, the Rio Declaration on Environment and Development in 1992, the largest water pollution accident in Nak-dong River in 1994 in Korea, and the introduction of the new Environment subject curriculum into schools in Korea since mid-90s. Moreover, some national daily newspapers were leading environmental campaigns in this period with growing public concerns about environmental issues, e.g. “Green Scout” campaign by *Donga Ilbo* (1994) and “Thinking Green” series by *The Hangyerae* (1994. 04. 06-1994. 08. 31), and the coverage on environmental education has benefitted from this mood.

Media stories of environmental education seem to impute the role of education as solely that of instrumentalism over any alternative ways of telling educational stories. The popularisation of the term environmental education was indeed attempted in one voice from different social groups, including journalists, academics, policy makers and teachers.

[...] Together with the role of media in enlightening people, educational approaches should be considered. The reasons for environmental education are as follows. [...] in order to prevent from the irrecoverable impact of environmental problems, education approaches are the most urgent call. [...] The fundamental solution to environmental problems can be only sought through education. [...] (Column by an educational expert, *Seoul Sinmun*, 26 January 1994)

While the message is clear: “environmental education should be part of the school education”, the stories often feature the rhetoric of the role of education with three main themes: (i) ‘system’, (ii) ‘exemplary cases’, and (iii) ‘eccentric teachers making real changes’ that the following excerpts illustrate, in turn:

[...] Although environmental education was introduced since the early 80s, it is still yet to take root in schools, or remains only as slogan, therefore, it is at the moment far from nurturing future generation’s environmental values and worldview. In fact, school environmental education relies solely on the individual teacher’s personal enthusiasm, or only a handful of model schools that are supported by the Environmental office, not the Ministry of Education. [...] Environmental education in schools is no more than a rare event or

one-off conservation or clean-up campaign. In secondary schools, circumstances are even worse. The head teacher from a high school in Seoul says, "I am aware of the importance of environmental education, frankly speaking however, it is impossible to allot time for environmental education because it is not related to university entrance exams." (*Seoul Sinmun*, 26 January 1994)

[...] Environmental education is "Open Education" that encourages critical thinking and awareness on environmental issues. [...] With this trend spreading out, environmental education is increasingly of interest to parents. [...] The 'Wildflower Club' and 'Environmental Club' are some of the most popular clubs in this school. There is even competition to become a member at the beginning of the term. [...] (*The Hangyerae*, 06 February 1994)

[...] "My environmental education is based on the belief that the environment in which we live now is borrowed from future generations. Therefore my aim is to make pupils aware that the future is in their hands rather than to teach something special.", says Ms. Go, a primary school teacher in Kimpo about her belief about environmental education. [...] Hands-on experience and activity is her special interest. She and the members of Green Scouts in the school have carried out fieldwork in the local stream for last five months, and they completed an environmental pollution map of the region. [...] Through her instruction, the members learned to make handmade soaps from used cooking oils. They are very concerned about environmental issues. [...] Ms. Go won the first-grade "Green Flag" award for her environmental education research essays based on her year-long experience, from the Korean Federation of Teachers' Association. (*Donga Ilbo*, 24 June 1996)

Through these main themes, the storyline of school environmental education is typified by a strong sense of instrumentalism, shaping the ideas of environmental education as the "fundamental road" to making real changes in people's mindsets so that the ecological crisis can be overcome. In fact, the purpose of analysing the media stories is less concerned with criticising how environmental education is represented through the media, provided that media texts perform certain roles in the public domain, e.g. agenda-setting. Rather the story genre in the media is associated more with slogans and rhetoric than critical analysis of the stories themselves; at least the newspaper articles that were reviewed seemed to fall within this frame. But the stories about environmental education such as those above are not only limited to the media, they seem to be repeated in other public narratives as part of a repertoire on the role of education, e.g. environmental education as fairy tale (Harré, *et al.*, 1999; see also 1.2.1). In these stories, teachers are often described with stereotypical images such as "eccentric" characters or having "extraordinary" enthusiasm that leads to innovative approaches or real changes in schools. But then, how did teachers in this chapter tell different stories for going beyond the instrumentalist discourse of education?

As was most prominent in the case of the science teachers, the teachers' rhetoric about the 'good teacher' was a way of positioning themselves as environmental education teachers, not only by challenging more prevalent teaching and learning methods such as rote learning and 'fun science', but also by making the science teachers' role more 'permeable' to that of the environmental education teacher. The limit in pushing the boundary is also evident in terms of the extent to which teachers embrace an 'odd' teacher identity, which may put them into rather vulnerable situation in which their professionalism is challenged by pupils and other teachers, and the media and public discourse. Thus, teachers' professionalism requires ongoing reflexive identity work in the way that teachers present their identities and position themselves in various storylines that are other than, most notably, the unitary and non-contradictory 'hero'. In other groups of teachers' narratives, such dynamic identity work and rhetorical features were less visible, in that humanity teachers could quite comfortably wear an 'environmental' badge, whereas for Environment teachers, their vulnerable status obstructed active identity development. However, their relatively 'explicit' identity process still defies reading their stories from a single-storyline of teachers' becoming environmental educators, in that there can exist many unique and different metaphors and plots that stories can be identified as teachers live through their stories, as observed in Hee's "oasis" (see p.226), as well as live with "other exemplary teachers" stories.

This perspective is distinct from previous studies, such as a poststructuralist conception of 'agency' (Barrett, 2007; see 2.2.1) and an interpretivist analysis of 'optimization' strategies (Kang, 2007; see 2.2.2), particularly in theorising individual teachers' action as beyond 'barrier' tales and that of a 'heroic' teacher discourse. Both perspectives stress the limits in teachers' action: while poststructuralist notions of agency are more concerned with the power of dominant discourses that impinge on teachers' experiences and stories feeding into teachers' action, 'optimization' captures the state where a teacher's actual teaching behaviours and activities are determined through striking the balance between a teacher's pedagogical beliefs and the pupils' and curricular demands. The teacher narratives in this chapter could be read through either of these theoretical frames, if the focus of analysis was, in this instance, that of pinning down where limits to action or real changes lie. Instead, teachers' rhetorical work in arguing for their professionalism shifts us into looking at the flexible manners in which teachers manage contradictions, e.g. through 'ambivalence' (see 6.1.2). In this symbolic process, boundary-crossing or shifting through teachers' identity work is not just a matter of recognising and resisting dominant discourses (e.g. rote learning), but also capitalising on the discursive space that they allow (e.g. June's embracing of 'fun science' approaches; see p.213).

In common, the stories suggest that for these teachers, environmental education is not primarily about problem-fixing, but about teachers' living with and through institutional paradoxes. While eleven teachers' stories about their environmental education experiences in this study denote more struggles than successes in displaying ongoing reflective identity work in envisioning their professional identities and professionalism as environmental education teachers, institutional barriers and recognised 'gaps' were the very sites where such reflection and learning took place. In this, the analytic focus on identity construction processes rather than on particular identities enables us to interpret the stories of three different groups in terms of continuous learning processes of seeking other and possible meanings of teacher identity and professionalism:

- By moving in-between spaces of good/odd teacher (science teachers);
- By gaining a niche status (humanity teachers); and,
- By seeking a new kind of specialism (Environment teachers).

In this, what is viewed as 'niche' and 'specialism' can be varied, therefore, these three 'cases' are illustrative of many possible ways of understanding environmental education teacher professionalism. To conclude, understanding teaching practice through the argumentative features of teacher narratives suggests that a common strategy sought by all teachers is a concern with the question of "What is possible?". This requires engaging in signifying activities through the active (and on some occasions, critical) search of meanings available, e.g. by defining, giving names for, and challenging other names ascribed to their teaching activities related to the environment, and these ascriptions can be elicited and produced through narrative inquiry. The surfacing and circulating of such meanings, can also help diversify the range of environmental education teacher identities available to the teachers, and in the literature; another layer of which is explored in the following chapter, on pedagogical meaning construction of the environment-related subject matters.

Chapter 7. In search of curriculum repertoires: teaching under contingency and complexity

❖ Chapter introduction

Chapter 6 discussed how different groups of subject teachers came to be engaged in different forms of professional development, whether through opening up spaces in their subject (science teachers), or pursuing the achievement of a new kind of specialism and status in schools (others). Importantly to the research methods, teacher identities were framed as (being) constantly constructed through dynamic processes between multiple discourses, such as of the ‘proper’, ‘good’, ‘science’ teacher that make cultural norms, resources, and subject positions available, and of teachers’ taking up those meanings and interpretations. How then does this perspective help analyse the ‘content’ of teachers’ environmental education, such as their environmental and curriculum knowledge?

As the third chapter of data analysis, this chapter provides an analysis of six curricular topics based on all eleven teachers’ stories, illuminating the individual teachers’ repertoire-making processes via their curriculum narratives.

The chapter consists of three parts as follows:

- Perspectives on curriculum repertoire for analysing key processes involved in teachers’ environment-related curriculum development;
- Analysis of six curricular topics; and,
- Discussion of contingency and complexity in repertoire-making processes and a critique of exemplary teacher discourse.

7.1. Perspectives on curriculum repertoire

7.1.1. Environmental education as an act of repertoire-making

I still have this conflict – if I stick to this particular part, wouldn't I then miss any other part? But my colleague advised me, "*Find your own theme since you can't teach everything*. If you keep pursuing certain areas, you will find out your own answer." To be honest, I am not entirely sure about this. I wish some research could conclude that environmental education is effective to pupils' (behaviour) change in the long term, so that I am able to say to pupils, "See, this is why you have to get environmental education." But in fact, there is no such thing like that. Moreover, it is almost nonsense to teach about the environment when the university examination is at hand. (Hee, F1)

Hee's question about finding her own 'theme' might be mainly concerned with the vulnerable status of Environment teachers and the optional curriculum subject in schools. Yet other subject teachers' stories, their environmental education becoming concerned with re-envisioning their professionalism as doing things more and doing differently, also seemed to exhibit the degrees to which teachers sought their own themes or specialism, either grounded in their subject areas such as science, or in particular environment-related concerns.

[Y1]

Young: Since I teach middle school biology, there is not much space for introducing environmental topics³⁴.

Researcher: Are there any topics you want to teach although it is not part of the curriculum?

Young: Hmm, the topics that I would like to teach about? 'Ecological lifestyles'... have recently been aired on television. It would be difficult to put those ideas into practice, but I would like to give pupils opportunities to think about the significance of such ideas, because they are not part of the everyday issues that pupils would talk about. I would use some video clips or documentary films. However, it is not easy to find time for that, moreover, I don't think that pupils will find it very interesting. Since their thinking skills

³⁴ In middle school science curriculum, topics that directly address environmental issues appear more in physical sciences than biology.

are not as mature as high school students', it is a little too much to expect those pupils to think about those issues.

Young's idea about 'ecological lifestyles' illustrates how a teacher's consideration into curricular topics about the environment would begin. Her personal interest in life style issues was related to her concerns about child-raising, by contemplating how living away from urban lifestyles can help her child's development. Owing to a lack of time and knowledge, the idea has not yet been enacted in her teaching, whereas other teachers were able to elaborate their knowledge and concerns and develop 'well-being' and health – related curricular topics (see below).

Environment teachers, for the sake of a subject specialism that covers multidisciplinary knowledge, do need an extensive range of curriculum repertoires. Yet as a novice teacher, Sue's, and the other Environment teachers' primary concern, was to gain confidence in teaching, by sticking to more traditional approaches and methods rather than experimenting with new ones.

Until now, I made a lot of effort to awaken pupils' curiosity so that they listened to me. I used to tell how some behaviours will cause environmental pollution, and then I found pupils listening more and showing interest. However, now I wonder in doing so, pupils only get negative impressions about the environment. I also wanted to use news articles to introduce current environmental issues, however, I found myself focusing on things like water pollution or environmental hormones amongst others. There might be other areas to be developed, such as issues-based inquiry, but I don't feel confident teaching this. I would like to get some help from other teachers. Now that I have taught for two years, I came to realise that teaching should be more than just satisfying pupils' curiosity and interest. (Sue, F1)

Teachers did often address their particular interests and concerns related to the environment, although the curricular topics or skills remained unfledged. In fact, to develop new repertoires seemed to be related to teachers' expertise and teaching experiences.

It was through such understandings that the notion of 'repertoire' can help capture the unique characteristics of the teachers' environmental education curriculum, by illuminating aspects of 'building' and 'expanding' different kinds of curriculum approaches and skills (cf. Joyce & Showers, 1988). Given that the interview methods were limited in eliciting a full version of their curriculum stories, such as including a description of their actual teaching and learning in classroom, the ideas about repertoire developed here are based on the context and process in which six curricular topics were interpreted by teachers. In this, teachers' acts of prioritising, resourcing, rehearsing, and practising emerged as the main theme. The analogy with musical repertoires helps

further understand the teachers' curriculum by highlighting that different teachers would play a different range of repertoires depending on their genres (e.g. curriculum subject) or preference (e.g. particular environmental concerns), except that teachers are not just the 'performer' but also the 'composer' of repertoires. The focus on action also invokes a sense of 'reservoir' and 'resource' (cf. Bernstein, 1996), e.g. the 'reservoir' can be very vast when it comes to knowledge of the environment. For the inquiries, six curricular topics were identified as illustrative cases of teachers' main interest and concerns that characterised the environmental education of these eleven teachers:

- Alternative energy
- Environmental issues
- Health and 'well-being'
- Biotechnology issues
- Outdoor education
- Green education

Importantly, the six curriculum topics are neither exclusive nor exhaustive categories that consist of the eleven teachers' environmental education curriculum practice. Instead, they illustrate the notion of 'repertoire' by depicting various contexts and modes that shape teachers' specialisations or personal pedagogies and topics that are related to the characteristics of environmental education by the teachers – that is, that extend the 'standard' range of curriculum repertoire. In the case of the science teachers, their environment-related curriculum repertoires are likely to be grounded in their capabilities to identify and select relevant resources from science-related contexts. But the scope goes beyond the mandated curriculum areas, e.g. environmental science and ecology. In other words, teachers' knowledge and expertise that consist of such repertoires reflect individual teachers' active engagement with curriculum development, and hence, their interpretive practices of and the dynamics in pedagogical meaning construction.

Among the six topics, some were more concerned with a teacher's unique interest and expertise (e.g. Alternative energy - Han; Green education - Kim), while others were shared among the teachers. Meanwhile, it was difficult to identify curriculum repertoires from Environment teachers' stories, due to their short teaching experiences compared to other teachers in this study, and the time constraint during the interview to elicit in-depth curriculum stories. While still considering that there are 'potential' elements in the curriculum narratives that might be fully developed into a form of repertoire, representing teachers' curriculum in terms of six categories intends to stress the ways in which curricular topics and subject matters reflected temporal, cultural and historical particularities in the construction of pedagogical meaning.

7.1.2. Cultural mediation in repertoire-making

In fact, research into teacher knowledge and professional development has sought to understand how student teachers or novice teachers learn to teach by building and expanding their curriculum repertoires, by conceptualising those domains of knowledge as different ingredients of a teacher's repertoire (e.g. Smith, 1999; Appleton, 2003; Scott, 2003). Narrative inquiries in education also pay attention to the idea of 'teachers as curriculum makers' (see 3.3.3). In this, the notion of repertoire seems to be understood in terms of teacher competency and self-efficacy. Teachers' stories about environmental education seem to do justice to this idea, in that experienced teachers' curriculum stories suggest some degree of 'narrative competence' (Gudmundsdottir, 1991; Carter, 1994) based on their specialism and pedagogical beliefs and convictions.

However, the inquiry into the repertoire-making process for the six curricular topics has led to an alternative way of conceptualising teacher competence to mastery discourse, by taking into account the role of contingency and complexity in the construction of pedagogical meaning. This section elaborates this perspective, by addressing the significance of the cultural processes that operate in shaping and constraining teachers' understandings and interpretation of 'environmental' 'education', and hence, their repertoires.

In developing biographical understandings of teachers' environmental education in Chapter 5, regarding the question of "what does engaging in environmental education mean to teachers themselves?", through themes such as 'learning' (Young), 'progressivism' (Han), 'taste' (June), 'compass' (Lee) and 'ideal' (Kim), the five teachers' stories illuminated the ways in which personal and professional identities can become blurred, and further facilitate teachers' theories of action and sense of continuity of a life. Such self-understandings are not just deeply personal in nature but also intersubjective in that stories evolve through projecting self-images into culturally available ones, e.g. desirable, acceptable, thinkable models and identities. In the same vein, teachers' curriculum repertoires can be understood as ways of manifesting their professionalism, and in this case, their composition mirrors culturally available meanings of the environment. For instance, reading cultural histories through teachers' narratives in 4.2.2 enables an examination of three curricular topics – health and 'well-being', outdoor education and biotechnology issues, as more directly linked to associated cultural phenomena and events. Alongside this, this section further addresses how culture permeates teachers' curriculum practice³⁵.

³⁵ In traditional anthropology, the relationship between education and culture has been theorised in terms of cultural transmission, acquisition, enculturation, or assimilation. But the 'cultural turn' in the social sciences emphasises the

As already suggested in the previous section, the idea of repertoire can denote a relationship between reservoir and resource. While the objective boundary of reservoir might be unknown, the characteristics of teachers' participation in environmental education indicate the cultural boundness of resources and pedagogical opportunities that shape and constrain teachers' interpretation, in terms of three aspects:

- *Teachers' groups and NGOs*: the major sites of professional learning, collective identity formation, and new and experimental ideas about curriculum;
- *School culture and National Curriculum*: the actual site of curriculum practice, constraints of the timetable, examinations, subject divisions, and the individualised cultures of teachers; and,
- *Cultural narratives of the environment*: the media, everyday consumption, environmental concerns, controversial social issues, and environmental policies, etc.

These are meaningful locations where teachers' curriculum repertoires are built and practised, operating as symbolic practices and processes. Concerning this, materials such as lesson plans, teaching guides and programme books represent shared concerns and meanings among the participants in the teachers' groups and NGOs, and hence form a more concrete version of possible repertoires. On the other hand, the relationship between the three locations can be in tension. For example, teachers may find the institutional culture in their schools hamper the actual implementation of the curriculum. Also, cultural narratives of the environment may impinge on the provision for new environmental concerns, e.g. 'well-being' and biotechnology issues, by producing frames of interpretation through the medium of popular culture or particular cultural events. The six curricular topics seem to suggest that there are different ways in which teachers' repertoire making processes are mediated by the cultural processes of pedagogical rendering meanings of the environment, education, and environmental education. Table 7-1 (see next page) summarises the story elements that consist of teachers' curriculum repertoires in ways that indicate different configurations of the mechanisms of representation and relationships among the locations.

As a repertoire, each curricular topic signifies a unique way in which different components of teacher knowledge and beliefs including subject matter knowledge, teaching methods, learning objectives, and philosophy of education, are combined and selected (also suggested in Chapter 6). In this, the focus on six curricular 'topics' intended to investigate how particular environment-

importance of meaning, and therefore, viewing culture as more about symbolic systems, processes and contexts that constitute everyday practices and meanings, and not as determinants of human behaviour (Geertz, 1973; Hall, 1997).

related cultural resources become subject matter, and how teachers ‘translate’ those available resources into pedagogically meaningful stories. In this sense, the purpose of analysis is less concerned with mapping the categories and properties of teacher knowledge and beliefs that are composed of a particular repertoire, and instead, more with examining pedagogical issues represented in each repertoire.

Table 7-1 Story elements of curricular repertoires

Curricular topics	Teachers’ Groups and NGOs	School culture and National Curriculum	Cultural narratives of the environment
Alternative energy:	Programme development experience in an NGO (Han)	Energy club, hands-on activities	Energy crisis, solution, global scale
Environmental issues:	Teaching guides and materials by Teachers’ STS Group and EE Group (all science teachers)	Decision-making focused instruction, teacher neutrality	Conservation side vs. development side opposition in policy cases
Health and ‘well-being’:		School dinner and garden	Consumption and commercial trends
Biotechnology issues:	Teachers’ STS Group (Han, Young)	(Science) teachers’ silence	Stem cell research scandal
Outdoor education:	Teachers’ EE Group (Min), Youth Union (Hong)	The limit of time and space	Appreciation of nature experience
Green education:	Teachers’ Union (Kim)	The culture of teachers, the structure of the National Curriculum	

7.2. Six curriculum narratives as teachers’ repertoires

In this section, teachers’ accounts were presented alongside my interpretation. Compared to Chapter 6 where conversationally dynamics were important to interpret shared meanings, transcription codes were not strictly applied.

❖ *Alternative energy: Finding the ‘answer’?*

My work has been focused on energy issues. It happened to be like that since I was engaging in the Teachers’ STS Group and NGO activities. I am running an alternative energy research club at the school. During the school festival, pupils prepared a booth where

they demonstrated how to cook rice by using a slow cooker and presented the actual working of solar energy. (Han, H3)

‘Alternative energy’ was Han’s unique theme, and the energy club at the school is a testament to her personal devotion. As a science (earth science) teacher, she considers teaching about alternative energy to be essential to achieving her ideal of science education that incorporates science and value issues (see also Appendix 4.2.2). Han’s repertoire then touched on different locations where she reflected on ideas and teaching experiences, including the university curriculum, Teachers’ STS Group, NGO, and school. Participation in developing and teaching educational programmes in an NGO is not usually expected of teacher’s work, but for Han, it became a key site for professional development.

The hands-on experience related to alternative energy can be as valuable an experience as outdoor education is. Fundamentally, it is about nurturing deep sensitivity in pupils’ mindsets. In this way, it can be an alternative approach to the conventional, ‘tighten-your-belt’ type of energy education. Although environmental education is increasingly popular in NGOs, our programme is the unique place to learn about energy issues. The traditional approach in KEMCO³⁶ and school education in general tends to put too much emphasis on ‘saving’. In contrast, our focus lies in alternatives. (Han, H2)

Teaching about alternative energy is not new in the National Curriculum in that the importance and different types of alternative energy are introduced in science syllabus. But Han’s curriculum goes further than that which is mandated in the curriculum, by pursuing the value of hands-on activities through which pupils can see how the alternative energy system really works, and thus learn more than abstract ideas:

I am currently teaching about alternative energy at the NGO during the weekends. We developed and tested a solar energy programme for children through several times of evaluation, and then we are now developing a wind power energy program as a follow-up programme. It seems to work quite well, and I can say that this is a significant achievement because of its unique focus and speciality. The next stage should be about how we can disseminate the approach so that it can be shared with more potential learners. Children seem to like to come around here, probably because the educators are not too strict, and learning is not as demanding as it is at the schools. This programme can be re-packaged as a type of so-called ‘early education’ in the sense it can contribute to nurturing citizenship skills for environmental responsibility as a future consumer which begins with the use of

³⁶ Korea Energy Management Corporation (<http://www.kemco.or.kr/english/index.asp>)

renewable energies in their life contexts. It strategically aims to appeal to a wider range of the parents including the ones who are not probably that much environmentally conscious, but simply interested in 'gifted education'. They would think that the programme serves this interest through hands-on learning of 'high-technology'. (Han, H3)

Han's narrative of her repertoire comprised detailed accounts of the process of developing energy education programmes in the NGO. She was well aware of what may appeal to children and parents. The popular discourses such as "early education" and "gifted education" were drawn upon to provide justifications for the "educational value" of alternative energy education. Interestingly, when she made claims about how the programme can contribute to "early education", in terms of "citizenship skills", the original meaning that is usually associated with parents' obsession with their child's academic talent was twisted. The same rhetoric was applied to "gifted education" and "high-technology".

Han's belief about alternative energy as an effective learning approach was based on her long experiences and commitments in alternative approaches to science teaching, in and outside the school and the curriculum, as was often the case in the teachers' professional development opportunities in this study. As an experienced teacher, Han's repertoires were more extensive than any other teacher in the study, but it was when she was talking about alternative energy that her voice was most full of conviction and passion. Indeed, working with academics and NGO people on energy issues, and STS-related issues in general, "convinced" her to argue that there can be an "answer" to environmental problems, which concurs with her disposition of "progressivism" (see 5.2). This strong sense of conviction appears to be a unique case among teachers' repertoires, as other curriculum narratives display more uncertainty about pedagogical skills and knowledge, and teachers' struggles in transferring environmental topics into educational languages.

Yet still, Han often felt confused about the degree of "expertise" that teachers need to have. In fact, NGO activities were largely run by policy researchers who are the 'thinkers', and education programmes tended to be treated as just "projects". As Han noticed that 'environmental education' is only minor role in the work of the NGOs, the value of education and teacher's knowledge and professionalism appears to be far from fully appreciated or firmly established in actual practice. Han's repertoire of alternative energy then was being practised and re-written through ongoing effort to consolidate the educational significance and meanings of the curriculum in the NGO and the school.

❖ *Environmental issues: limits of learning from real issues*

Teaching socially controversial environmental issues was every teacher participant's concern. But their repertoires do not feature teachers' knowledge and competence in a straightforward way. The pedagogical concern over 'decision-making' represents a case in point. While teachers shared the idea of decision-making processes and debates as a key part of learning about environmental issues, taking either a 'conservation' or 'development' side appears to be a typical instructional frame. The stress on 'decision' in the teachers' repertoires for environmental issues was related to the actual context of environmental policy and social processes, where the extreme divide between the 'conservation' side and 'development' side often appear, the 'Reclamation Project' being a very representative case (see also 4.2.2). But how does learning through real cases help facilitate pupils' learning?

Even though I try to approach environmental issues from the so called 'Two Hats' perspective (Hug, 1977), it doesn't work like that from pupils' perspectives. At the stage of the final decision making after all these debates, pupils seem to try to read my face as if I've got my own preference. Then they say, "I know you are giving me a bad score if I vote for the 'development' side!" ((All laugh)) I mean, pupils already see me as an environmentalist even though I try hard to remain impartial. It seems that more considerations are needed. (Yun, F1)

Indeed, although it might be an easy approach to decision-making, it was not sufficient to facilitate pupils' learning in that pupils already presumed the 'right answer' without critical engagement with their own ideas.

When teaching environmental issues, I focus more on pupils' decision-making processes than knowledge acquisition. The know-how is to set the basic rules that every pupil should follow. For instance, everybody should participate in the discussion, and clarify their own ideas through any forms of presentation. In this, the teacher should prepare as many available resources as possible so that pupils can examine diverse perspectives as well as their own. We (STS Teacher Group) developed a 'Consensus Conference' model to teach the 'Reclamation Project' issue. In the first stage, pupils choose to be one member of the ecosystem including for example, sea shells, and put on a mask that stands for the creature. In this process, they are encouraged to ponder the values and perspectives from the standpoint of the various members of the ecosystem, and represent their points of view through good argumentation. At this point, the teacher shouldn't impose any ideas. Then, they vote to decide whether the reclamation project should proceed. The result can be either pro- or anti- the project, and pupils do not necessarily favour the environmentalist position. I

am caught in a dilemma when the majority of them vote for 'development'. All I can do is to present the arguments from the other side, and encourage them to think whether they have adequately considered alternatives. I believe more research needs to be done to solve this dilemma. This is tricky. I thought I've done enough to encourage them to think carefully. However in fact, they seem to make a decision too easily, or tend to take a very neutral position, not bothering to engage critically. (Han, H2)

Han's "Consensus Conference" model³⁷ aimed to engage pupils with thinking beyond human-centred views by considering what animals would think about the environmental changes that the Reclamation Project could cause. But the story's ending still depended on pupils' decisions. While there are different opinions about teacher neutrality, Han and Yun seemed to share the view that the main objective of instruction should be to develop pupils' critical thinking skills. However, both teachers found it difficult to engage pupils with the learning process itself, as pupils regarded the outcome of the decision as the main focus.

There can be many ways to understand the reasons for the barriers that obstruct pupils' engagement with environmental issues. Probably it is partly because pupils are more used to giving the 'right' answer than expressing their own ideas and taking part in the discussion (also pointed out in 6.2.1). With such conventional learning styles on the one hand, on the other the teachers wanted to know what pupils think about environmental issues more generally. Lee's personal project of "database" (see also 5.2) was concerned with compiling pupils' views of environmental issues:

I get them to discuss about what they would respond as a citizen if a local council comes up with an anti-environmental development plan. The vote tends to be divided fairly equally. When it comes to an anti-environmental facility, they seem to take a 'not in our town' attitude. Generally pupils seem to approve of the ideas such as protection or conservation without critical deliberation. The truth might be that they are not so interested in this kind of stuff, always occupied with the incessant loads of study that even continues after school. But I do wonder whether this sort of pro-environmental disposition comes from their relative affluent background in this region. I want to understand, if only vaguely, what this young generation thinks about their environment. (Lee, L3)

³⁷ "A consensus conference is a forum at which a citizens' panel, selected from members of the public, questions 'experts' (or 'witnesses') on a particular topic, assesses the responses, discusses the issues raised, and reports its conclusions at a press conference" (UK CEED; <http://www.ukceed.org>). The model began first in Denmark in the late 1980s, and the conferences have been held in many countries since then, including Korea.

I wonder whether the pupils' dispositions would become already oriented toward conforming to economic ideologies, as pupils are brought up in a society where economic values outweigh anything else. Also, it might be related to their less affluent living conditions in this area, that push children to adopt the view that being an economically well off person is the (only) desirable future. (Han, H1)

The observations made by Lee and Han suggest that both teachers see pupils' economic background as influential in forming their environmental dispositions. Pupils' living situations and experiences can be formative to some degree, if not the only, or definitive factor. Teachers' understanding of 'larger contexts' such as this might trigger further reflections on simple 'decision-making' approaches in ways that reflect pupils' multiple identities and complex living situations.

Moreover, the actual social and policy context of environmental issues can be understood in terms of the complexity and contingency of social processes. June's and Min's deliberations on a current environmental issue suggest teachers' careful approaches to environmental issues:

The story about the female monk's hunger strike got on my nerves. I don't agree that taking such an extreme action, in the name of acting for the environment, deserves any serious attention. In fact, the issue involves more complexity, thus it shouldn't be approached in that way. It seems to me that the project is inevitable, and thus you can't just argue that this area must be protected at the expense of the destruction of any other areas. I don't think the story is educational at all in that such an extreme situation does not help to facilitate critical thinking required for making a sound judgement. If I introduce the issue to my teaching, my focus will be on the facts and value issues. (June, J2)

To be honest, I don't think that there are better alternatives on Cheonseong Mountain issue, whereas I am pretty confident about my position about the Reclamation Project. If we don't opt for a tunnel and decide on a detour, even more serious environmental destruction can occur in other places. Of course I don't believe that the express train is necessary in this country. However, once the policy decision was already made, there seems no way to reverse the decision. I think her going on hunger strike can rather backfire in public opinion, that the environmental movement ignores realistic options. I hope that teachers do consider this aspect of the issue. (Min, M1)

Both teachers gave the example of the Cheonseong Mountain issue to make the point that environmental issues are not easily transferrable into simple curriculum approaches. The issue was provoked by a governmental plan to build a tunnel that cuts through the mountain, as part of the railways for new express trains, and like other issues, public opinion was divided. But in 2005, the

story entered an unexpected phase when a female monk went on a hunger strike in protest at the flaws of the environmental assessment by calling for a full review. With no compromises made, the tension was high and the media's attention was big. The extreme situation even divided environmentalists. June and Min were aware that some environmentally conscientious teachers were initiating a move to support her campaign. Both teachers showed a critical view: while June dismissed the story itself as not helpful in resolving the controversy, Min argued for a more cautious approach to teachers' action.

To sum up, teachers' reflections on the limit of decision-making methods in teaching about environmental issues illuminate the need for understanding complexity, controversy and political situations involved in the social processes of environment-related decision making, and the potential influences on pupils' preconceptions about environmental issues.

❖ *Health and 'well-being': considering the political economy of everyday lives*

'Well-being' is a cultural phenomenon in Korea, mainly led by commercial trends (see 4.2.2). During the interviews, teachers showed much interest in consumption- and health-related issues as personal as well as pedagogical concerns. June was able to conceptualise "consumer education" in her own words. Having embarked on the Master's course in environmental education at the time of interview, her main interest in environmental education was to develop science teaching approaches that help pupils understand how their everyday life actions and consumptions are related to conflicting values.

I am interested in consumer education that integrates environmental issues. There are no obvious answers when it comes to consumption. Some people would prioritise environmental values, whilst others put their own tastes or health at the top of the list. I want to see how pupils communicate with each other to make a decision by considering conflicting values such as these. It is said that behaviour change is the ultimate goal of environmental education. However, pupils' action is very limited for making big changes. But any kind of behaviour is somehow related to consumption. This is why I think consumer education is very important. (June, J1)

Teaching science in a middle school, she found that the curriculum space to address these issues was limited. But in envisaging that she might be able to find some space when teaching about digestion and circulation in Year 2 biology, she developed a lesson for the assignment at her first term of the Master's study:

I developed a lesson called “What will I buy for a snack?” The lesson begins with pupils’ talking about their experiences of buying snacks after school. Then, the next step is to re-construct their story by considering health issues such as the concept of the ‘life-cycle’ of the food that they selected to buy. So, the gist of this activity is not merely about making a right decision, instead, it aims to put pupils in a conflicting situation so that they can engage in ‘rational communication’. (June, J1)

In the previous section, teachers’ repertoires of environmental issues were also based on learning objectives that encourage pupils to understand different values and perspectives related to the environment and enhance their communication skills by engaging in decision-making processes. But what is distinguishable in June’s consumer education is the emphasis on pupils’ everyday life contexts. The idea of decision-making should be relevant to them and the decision should have a direct impact on their behaviours:

I am very concerned about economic injustice issues. I would tell pupils not to eat junk food because it is not healthy. However, the dilemma is that, when pupils want to buy some snacks at school, for example, the choice will be limited by their pocket money. So, I need to say more than healthy and unhealthy stuff. Furthermore, we can’t always put the environmental value as the top priority in every single matter. People have their own tastes that may come against environmental values. If too much emphasis is placed on the environment, pupils may end up with a negative perception about it, or complain that we can’t do anything because of the environment. We can’t help but to make a compromise at some point. (June, J1; also in 6.2.1)

In this vignette, June deliberates on how pupils might think about the ‘environment’ if environmental values are imposed as a moral duty that pushes them to act ‘for’ the environment. She knew from her own experiences that people cannot just act for the environment only because it is the right thing to do. Buying organic food was a very personal lifestyle action that put June into the dilemma, and she was knowledgeable which items were organic and which not, given all the options and qualities. Confessing that if she always put environment as her top priority it would be so stressful, June believed that pupils would feel the same way, and then the pedagogic focus should lie on the learning process itself. This perspective then made June distanced from some other teachers’ partisan or campaign styles, e.g. encouraging their pupils to sign for a petition against the golf course building project, which she regarded as “pedagogically unsound”.

Here is the case. There are many organic goods imported from Australia lately. It is organic but it takes extra cost and energy in the transportation and packaging. This is where my

question starts. But those teachers seem to assume that there is such an environmental value out there, therefore, what we need to do is to act for it. (June, J2)

In this, June's focus was on asking the question of what is of environmental value before considering acting upon it. And this is the very core question that June expected her pupils to be able to wrestle with through learning about science. Her repertoires then included trendy snacks such as "well-being milk" and "black bean milk" by encouraging pupils to see through the images attached to 'environmental' or 'healthy' labels and to be motivated to seek and know the "truth". "Scepticism" then is a very "scientific attitude" that should be promoted in science education, in order to contribute to environmental education. This is beyond what is conventionally defined as science teachers' work. Recognising the limits in her knowledge, June expected to gain further theoretical understandings from the Master's course to develop new perspectives or reinforce her own beliefs and ideas. The perspectives of "sociology" and "social constructivism" helped her to challenge the "essentialist" assumption that there is a body of knowledge out there that underpins the "transfer" model of curriculum³⁸.

June's repertoire for consumer education then was closely related to the ideals of science for citizenship and the scientific literacy movement (see 3.3.2). Other science teachers also addressed the need to reformulate the role of science and scientific knowledge for investigating the truth behind popular images and commercial goods.

There are popular delusions or misconceptions about scientific knowledge. 'Citizen Science' is the idea that ordinary people can do science. There was an actual case of this: local housewives set out to investigate air pollution and succeeded in disclosing the fact that it was caused by the overproduction of dioxin produced by the local incinerator. (Kim, K1)

Kim's story went further on his observations of the ways in which science was used to promote commercial goods such as vitamin-enriched food and how susceptible people were to advertisements. Indeed, from the perspective of a science teacher, cultural phenomena and narratives appeared to provide many topics and issues to be critically examined through science and about science. In this way, teachers' reflections on their own life styles and actions, together with their observations on cultural phenomena, seem to meet theoretical perspectives and concepts, in ways that lend themselves to supporting teachers in reflexive teaching and learning processes. In this regard, cultural phenomena and trends related to health and well-being became culturally available resources as well as increasing the challenges for teachers to teach science. How can

³⁸ This paragraph epitomises June's vision of education through environmental education (see also June's story in 5.2).

teachers then approach the truth about the role and contribution of science? As June stressed, the pedagogical significance may emerge as teachers extend their repertoires by helping pupils wrestle with issues, deconstructing and reconstructing meanings concerning ideas of ‘science’, ‘health’, ‘well-being’, and ‘environment’.

❖ *Biotechnology issues: how to deal with powerful science stories?*

Concerning the role of science and science teachers, a further question can be asked: is it always possible for teachers to maintain critical perspectives in interpreting and challenging dominant cultural meanings? Whereas teachers’ repertoires of health and ‘well-being’ were bound up with assumptions of teachers’ agency, the stem cell research scandal (see 4.2.2), being such a powerful story that drove a nation into turmoil, is illustrative of other possibilities, by impinging on teachers’ actions and their pedagogical beliefs and conscience. The interviews were conducted just before and after the event unfolded dramatically, and captured a range of responses, such as doubt, criticism, confusion, and frustration over the course of the event:

We were furious about the way the whole situation was shaping up. It seemed there was no one who would raise an ethical issue apart from us. So, we convened to work on it during the summer vacation. We developed teaching materials from feminist and bioethical perspectives. This was before the truth of the scandal was revealed. At the time we just had suspicions on the number of eggs used for the experiments, but didn’t go as far as to doubt the results of the research. When it turned out to be a complete fabrication, we were absolutely shocked. But I now believe that the scandal gives us a lesson, a sort of ‘brake’, by stopping the madness at which the stem cell research was driven, and allowing us time for reflection. (Han, H3)

Han and members in the Teachers’ STS Group had been watching the stem cell research stories since Dr. Hwang’s research turned into a story of heroism through the endorsement of the government and the media, as well as marginalising critical voices demanding strict regulations on bioethics prior to the progression of the research. Before the scandal unravelled, the teachers threw their efforts into addressing the ethical implications of human embryonic stem cell research including egg extraction and controversies about the boundary of life. In fact, biotechnology issues were integrated into the science curriculum, if only sketchily, and so addressing bioethical issues in science classes was not entirely a radical repertoire. But as the story became scandalous and dramatic, the teachers’ repertoires began to show twists and turns:

People's concern was still about whether it was fabrication or not. Since I am a biology teacher, some teachers came to ask me about the truth, looking very disappointed as the truth gained momentum. One day, one kid asked me with serious look, "Is it really true? Then, what will happen to the country?" I just told that there was a serious flaw in the research process, it was ethically wrong, and scientists can't just close the eyes to such issues and get away with it. Not many pupils expressed their concerns openly, but they were aware of the situation. (Young, Y1)

I believe now that nothing else is as important as the truth itself. The media and the public were so much obsessed with heroism, only highlighting the positive aspects. Then everything turned out to be a fake, all of a sudden. I can understand that people would feel blank. I do believe that we would have not faced such turmoil by now if there had been a balance in the different voices, so that people could see things more critically. (Young, Y1)

Young was vividly depicting how the public, pupils and teachers dealt with the dramatic stories themselves, not just the bioethical issues or related scientific knowledge. With accounts of scientific heroism being amplified through the mainstream media, and the silencing of alternative voices, public denial about the truth – the research being a fake, was bound to happen. Facing the dominant ethos over the course of the event, teachers with different views must face isolation and marginalisation:

During the course of the public bewilderment and even denial across the nation as the story unravelled, science teachers in the school didn't seem to be bothered at all, or looked no different as the national atmosphere fluctuating between hopes and fears. I went crazy seeing these people! I doubt the biology teacher sitting next to me knew anything at all about Dr. Hwang's research. They just don't want to know the truth. (June, J1)

The drama and dominant cultural ethos became the tipping point that made the teachers realise their own beliefs as being opposed to the majority of others, which may not appear so obviously in ordinary times. For June, the scandal only confirmed her judgment about teachers in her school – "with no opinions" about any social issues in general. Science teachers in my study all found that they were the minority when it comes to the scandal. But more importantly, teachers' experiences of such a turmoil and feelings of isolation provided them with further reflective resources concerning ways of dealing with powerful science stories.

The mainstream media in fact played a key part in concealing the truth throughout the turmoil. Having said that, I do feel puzzled. School education disguises how our society actually works – driven by some invisible power relationship or political economy, only

persistently conveying false messages of morale and innocence. I believe pupils will also feel puzzled as they see the actual workings of the society betray how they are supposed to be. Then, what should I tell them as an adult of this society? (Young, Y1; also in 5.2)

What I can do through teaching high school biology will be, first of all, related to teaching about cell biology. It can also be addressed in relation to history of science and scientific inquiry which is the introductory section of the curriculum. Indeed, I believe that this person's (Dr Hwang's) story can be applicable to a variety of curriculum areas, such as scientific inquiry and the integrity of scientists. (Lee, L3)

In these vignettes, Young and Lee were contemplating what pedagogical issues the event posed and how to address them through teaching. In such a way, the scandal became the story that teachers will continuously read and re-interpret in extending their repertoires. The stem cell research scandal is probably rare or an extreme case with all the possible facets of a biotechnology issue – more political and cultural than scientific, and it is not always the case that teaching about controversial issues in contemporary science should entail teachers being involved in such a high degree of reflexivity, seeing through the stories and seeking the truth as in this scandal. In fact, science teachers' understanding of biotechnology issues varied depending on their personal and religious beliefs and pedagogical priorities. Yet, teachers' experience and stories about such a dramatic event highlight how teachers' repertoires can be formed through reflexive engagement with real issues by pursuing better pedagogical ways of addressing dominant cultural narratives.

❖ *Outdoor education: what value of outdoor or nature?*

'Nature experience' or 'outdoor education' has become a large part of environmental education programmes in schools and NGOs in Korea, together with the growth of public recreational facilities and places such as nature centres, national parks, ecological parks, and botanical gardens. Given the extremely demanding curriculum loads and accordingly rote learning based pedagogical practices in Korean schools, outdoor education, in upholding the value of hands-on activities and sensitivity, appears to promise new educational values that go against conventional teaching and learning approaches in schools (Hwang, 2003).

I believe that nature experience can become very promising approaches. Experience must be the integral part of environmental education. Ideas about the 'environment' are too abstract for pupils to understand, whereas forests or trees can give a more tangible sense. In this way, the idea of action 'for' the environment can be more easily grasped if accompanied by touching, feeling, seeing, and playing. (Han, H1)

Nature experience can become the source of inspiration. Pupils would start to wonder what if we can enjoy this in more places, or what if our school looks like this. Then, motivation for action and participation will naturally come through. (Kim, K1)

Teachers seemed to agree upon the benefit of outdoor experiences in terms of its ‘fundamental’ value by nurturing sense and sensitivity that they regarded as missing part in the current cognitive, knowledge focused learning in schools. Not many teachers in this study were actually engaged in outdoor activities as much as the two humanity teachers, Min and Hong, (see 6.2.2) did. But many of them had field-trip experiences, either out of interest or as part of their activities in teachers’ groups. For them, however, outdoor education programmes tended to focus largely on cognitive learning, which is far from their expectation of the value of nature experience:

I know those outdoor education programmes in the park near my place. I don’t think I like it. It seems to me that it is another kind of hak-won (cram school). I don’t understand why children are not just allowed to play, even just shortly. Educators just don’t stop lecturing about plants and whatever. (June, J1)

June’s concern was a more critical one. In the light of her lifelong passion for mountaineering, she knew learning in nature should be more about absorbing, not ‘knowing’. Then, it seemed to her that so-called outdoor ‘education’ or a ‘programme’ can claim no better pedagogical value than rote-learning. Our discussion on Cheonggyecheon (see pp. 210-211 in 6.2.1) illustrates an example of how ‘education’ can actually contradict the assumed value of nature experience when the meanings of ‘outdoor’ are attached to physical landscape only, without an understanding of ‘place’ where meanings are culturally and historically produced and re-interpreted.

These observations and critiques by teachers indicate that an outdoor education repertoire is not stabilised for school teachers in spite of it being a popular form of environmental education in Korea. In this sense, the two humanity teachers’ repertoires of outdoor education display difference rather than commonality in their pedagogical concerns and knowledge:

Since I am a history teacher, I am not knowledgeable in ecology and environment. What I do then is to prepare for a general knowledge quiz as part of the programme. Also, I used to write for the NGO newsletter about environmental messages implied in traditional Chinese phrases. We used to hold workshops and organise field trips for teacher training. But I don’t have in-depth knowledge about botany, maybe because I grew up and lived all my life in city. (Hong, H1)

Although Hong has been engaging in outdoor programmes in the NGO for many years, he did not claim to have expert knowledge. Rather, his main role was programme management while other teacher members were probably responsible for content development. Hong's repertoire then was mainly related with doing things outdoors, and challenges and barriers in doing so under institutional circumstances in schools:

Since schools close on Saturday every two weeks from this year, the pressure of reducing the curriculum tends to be pushed down to extra-curricular activities. Our school cut half of the slots, and it makes me feel bad. Moreover, many pupils have private tutoring after school, therefore they are not enthusiastic about travelling longer distances for field trips. Also, from the management point of view, outdoor activities can be seen as such a hassle given the health and safety issues. I noticed that when it comes to choosing extra curricular activities, academically competent pupils prefer less stressful activities such as film watching to outdoor activities. Outdoor learning involves thinking about environmental issues, which is not something pupils are used to doing. Environmental education is only a small part of school life. When pupils get rewards for environment-related achievement, it would get some attention. But that's it. (Hong, H1)

Together with the stories in 6.2.2 of his 'activity' focus, Hong's repertoire of outdoor education appears to be grounded in more practical knowledge concerning "how to make things happen", not so much in the substantial pedagogical 'content' knowledge concerning the values and meanings of outdoor experiences. Indeed, to make things happen in schools means teachers' volunteering to undertake extra work and toil.

In contrast, Min's vivid descriptions about his various experiences in the different schools well represents how his repertoires were built and extended upon the inspirations and experiences that kept him continuously reflecting on his own thoughts about and assumptions on environmental education:

I went on a study trip to Japan, and visited one local school where they had a small farm. It was very impressive. Shortly after I got back, I started to plant flowers in the school yard. Nowadays it has become popular, but it was not so at the time. I used to take pupils to the farm during my class. We grew barley. But the head teacher muttered that we should grow flowers in school yard. The next school where I worked was in the industrialised area. The environment was so grim there. It was at the time when I first made a pond in school. The soil I used came from rice field. Later, I accidentally observed a locust hatched off and it was an absolutely thrilling moment. So motivated, I made another pond near by, experimenting

on different kinds of plant this time. I learnt that plants can grow very well in a pond. I made seven ponds in the end. (Min, M1)

Min's environmental education was known among the teachers for his "emotional approach" that put priority on pupils' creative and artistic expressions. Obviously, knowledge acquisition was not the focus in his teaching. Min's more recent years' experience of rice-farming inspired him to rethink his theories about "ecological education" in the way that social issues such as food and farming can be integrated into the part of outdoor education experiences:

I opened the local centre in 2002, after reflecting that environmental education programmes were too often just one-off events. On the way back from a field trip, I sometimes sensed that something went wrong. I thought that it would be great if there was some place for environmental education in the village. In the meantime, I learnt that some neighbours were interested in the environmental movement. That is how we gathered together. We started rice farming, and after some trials and failures, we are now able to produce a good amount so that we all have some to share. The experience taught me that rice farming is such a crucial part in preserving our environment. I now believe that collaboration between people living in cities and farmers can make a real difference, for example, through the contract that guarantees a secure supply and price. I believe that we have responsibility to educate the next generations, as they would not necessarily have the same degree of patriotic sympathy for 'Korean' food as we do now. Since then, I think my horizon went beyond just 'ecological education'. (Min, M1)

The two humanity teachers' repertoires of outdoor education illustrate different ways of dealing with pedagogical issues concerning the educational value of outdoor or nature experiences. Hong's knowledge and concern were more related to programme management and practicalities, whereas Min's was to his theory of environmental education.

❖ *Green education: an educational ideal for sustainable society?*

So far, teacher repertoires of environment-related topics were understood in relation to the ways in which teachers' particular pedagogical concerns and knowledge reflexively grew, by dealing with contingency and complexity entailed in environmental issues and related cultural phenomena and processes. In contrast, the last repertoire - 'green education' which Kim was the proponent of, was grounded in the ideals of education, more generally, rather than specific environmental issues and topics, therefore theoretical and abstract rather than experiential and practical.

The main area that he and colleagues in the ecological study group in the Teachers' Union have worked upon was 'green education'. By developing curriculum theories, teachers wanted to influence the discussions around "Authentic Curriculum" in the Teachers' Union. Central to the idea is, that whereas 'environmental education' is considered subject matter, and accordingly it has limits in making an impact on the system of the National Curriculum beyond the restraint of subject divisions, 'green education' is an educational philosophy that puts together all the curriculum subjects into a framework of "ecologism":

To redirect the current curriculum into green education requires for, what we may call, a 'structural change of desire'. It seems to me that ESD didn't clearly and necessarily entail this kind of transformation. But I came across the ESD toolkit (McKeown, 2002), and I found the case study in Canada interesting in that they were implementing the idea of community-based educational reform processes. This case can be stimulating, given the centralised process of the curriculum development in this country. (Kim, K2)

'Education for sustainable development' (ESD) was in fact not the frequent term that teachers used in conceptualising their vision of education and environment-related experiences in this study (see Chapter 5). Kim's understanding of ESD was based on a vision of 'green education' which he regarded as more ecologically oriented whereas ESD was seen as more neutral. But Kim thought that learning about cases in other countries was still fruitful in envisaging changes in the school curriculum, through more democratic and participatory processes, which itself is the vision of green education and a road towards green education:

The 'Authentic Curriculum' initiative began three or four years ago in the Teachers' Union. But the discussions haven't gone far in making substantial progress. There will be sessions for this at this year's conference. I expect more teachers' interest in our ideas, since environmental education seems to get increasingly more credits from teachers these days. The conference will be organised by each theme (not subject) so that we can avoid ending up with tensions among the subjects, as it used to be. Since I am the person who is particularly interested, I would like to see teachers think about how they can redirect their curriculum into green education, but it is in their hands, after all. However, I believe it can be implemented in different ways through different subjects. (Kim, K2)

The 'Authentic Curriculum' initiative by the Teachers' Union was based on the critique of the 7th National Curriculum revision in terms of the fundamental aims and principles that school education is directed toward (see 2.1.2), and Kim believed that 'green education' should be one of the ideals that the alternative curriculum proposes. But 'green education' is such an overarching framework and largely theoretical that the actual content of the curriculum was not yet established, and the

integration of different areas of specialism from all subject areas would be key for driving further advancement of curriculum change:

Once the theoretical work is completed, the next stage will be to put forward our ideas in the curriculum revision process. Recently the process has been more open to teachers' participation. However, the thing is that there is no research evidence on how to make curriculum change in ways that meet the framework of ecologism. For example, the social studies teachers' group published an alternative textbook, and it contains many environmental issues. Apart from those subject matters, however, there is no discussion on how to transform the curriculum itself that is in part underpinned by an anti-ecological ideology. But I am not in the position of being involved that far since I am not the expert in this area. (Kim, K2)

Kim's own focus then lies in his science subject. He found new thinking in biology and physics particularly useful to think about the ideal of ecological society that upholds coexistence and diversity among people and between human being and nature:

'Natural selection is not the synonym of progress, but the evidence of diversity' – this is the gist of *"Full House"* (Gould, 1996). This was a revolutionary idea to me - progress means diversity, and the human race is not the most superior species amongst all kinds. As in the case of *"The web of life"* by Capra (1996), evolutionary biology inspired me so much. So I can say that it defined my theory of education. I believe that education should nurture diversity. However, the idea requires further theorising. In this, ideas from ecology offer analogies. For example, the idea of 'ecological niche' is that every species performs a right role in their own ways. Such an ecological principle should be applied to education. (Kim, K1)

How does ecology and evolutionary biology contribute to envisioning 'education'? Kim acknowledged that such ideas were not easily transferable to education, and in fact brought lots of criticism from other teachers. However he still pursued developing theoretical depth in the ideals of green education as an alternative to the powerful discourse of education that pushes pupils into competitions and individualism in our society. By thinking about cultural transformation, not just change in teaching methods, Kim's repertoire of green education was also related to the critique of the pervasive political conformity in the culture of teachers.

Not all teachers in the study maintained a critical view of the culture of teachers under the umbrella of 'green education', but many teachers did point out that engaging in environmental education entails rethinking what kind of 'teacher' they were inducted into through the current school

education system and culture. Teachers' feelings of isolation and frustration as addressed in previous sections and chapters were certainly related to the lack of collaborative ethos and culture in schools:

Environmentalism is about self-consciousness. They (teachers) have to think what's going on first. The ways of engagement or commitment will vary. But then, gradually the mindset will change. There would be no few junior teachers who at the beginning of career would say, "I'm an environmental education teacher." (Lee, L3)

You are right. Only few teachers address (socially controversial) 'issues'. I think to answer why, we have to ask "Why did you become a teacher in the first place?" Was it because you had your own principle about the profession? Or because you liked science? Or you simply wanted to have a stable career? I think most answers will go to the last one. (June, J1)

Most teachers in the study, like Lee and June, pointed to the cultural process of becoming a teacher as impinging on teachers' consciousness and action. In fact, for these teachers, teachers' study groups and NGOs, not schools, seemed to be the key site for the teachers' identity development by forming and sustaining like-mindedness and a sense of belonging (see also excerpts in 6.1.1). Kim's repertoire of green education was the idealised version in which such alternative teacher professionalism becomes an ordinary part of teaching and the culture of teachers in schools.

❖ *A summary*

Understanding six curricular topics as spaces for building or extending teachers' repertoires illuminates teachers' ongoing interpretation of subject matter related to the environment and the cultural processes involved in this. Each topic shows the ways in which teachers' sense of competence is concerned with not only their understanding about content knowledge and pedagogical skills, but also the characteristics of issues and topics of which meanings are culturally constructed, which can be summarised as follows.

Han's alternative energy repertoire seems to show the extent to which an experienced teacher's professionalism is actualised through concrete curriculum approaches and models. Indeed, teaching about alternative energy was a personally pursued "answer" as a science teacher who is committed to environmental education. In contrast, the other five topics illustrate more contingency and complexity in developing and practising the curriculum. In the environmental issues repertoire, the teachers' main pedagogic concerns were to enhance pupils' decision-making skills through critical engagement with issues. But teachers found learning through real cases was not always successful,

and their further deliberations found the importance of individual pupils' life contexts and actual policy contexts that might impinge on pupils' preconceptions about environmental issues and their attitudes to learning about them.

The health and 'well-being' repertoire could be distinguished from the environmental issues repertoire in terms of its focus on pupils' everyday life concerns. For science teachers, addressing everyday life issues led to a reflexive attitude towards the role of science, in setting the pedagogical aim of knowing the truth 'about' science, and/or 'through' science by deconstructing the messages conveyed through cultural trends and reconstructing possible educative values. In this, the biotechnology issues repertoire is a very unique case that shows how restrained teachers' capacities could be in dealing with dominant science stories. Meanwhile, two humanity teachers' repertoires of outdoor education were built on the different ways in which the value of 'outdoor' 'education' is interpreted. Thus, these four repertoires illustrate different ways in which teachers deal with cultural meanings and meaning-making processes, hence repertoire-making processes are concerned with teachers' capabilities of taking up cultural resources and translating meanings pedagogically. The final repertoire - 'green education', was more concerned with curriculum theories rather than particular topics or approaches, e.g. as a way of replacing the current National Curriculum in schools. Therefore, it can be understood as an ideal condition that makes all the other repertoires an ordinary part of teaching in schools. That the repertoire still remains abstract suggests that such repertoire-making is down to individual teachers' own commitments and professionalism, rather than based on the supportive culture in schools.

7.3. Teaching under conditions of contingency and complexity

The six curriculum narratives highlight aspects of teachers' sense-making of curricular topics as closely related to a 'translation' of meanings of cultural phenomena, issues, and narratives related to the environment, and their sense of competence. In this, teachers' environmental and curriculum knowledge is not just viewed as sets of knowledge and skills that should be 'held', but as being constantly contested and reflexively re-constructed through dialectical processes between different sites, such as teachers' groups and NGOs, schools, and wider cultural contexts (see Table 7-1). By extension, the metaphor of 'translator' can be helpful in re-conceptualising the teachers' role, in that teachers' environmental education repertoires illuminate teachers' interpretation of meanings in cultural texts, and production of pedagogic text. Successful translation will depend on teachers' capabilities of interpreting the messages in the relevant context, if it is to diversify rather than imitate the standard range of repertoires available.

This view not only supports the perspective that teacher beliefs and values as much as subject matter knowledge play a significant role in repertoire building, provided the nature of environmental knowledge(s) that are contested, and characterised by uncertainty and risk that environmental and sustainability issues entail (see 2.2.2 and 2.3.2). It further implies that curriculum development requires teachers' capabilities of dealing with contingency and complexity. Indeed, teachers' struggles are evident in dealing with cultural meanings, such as 'well-being', environmental issues, and the stem-cell research scandal, as the 'truth' about stories is not always knowable or easily accessible. In other words, the teachers' senses of competency and agency were subject to cultural conditions and dynamics in which the individual teachers (can find themselves being forced to) examine their beliefs and knowledge (cf. 2.2.1).

It should be noted that in conjunction with the discussion in 6.2.2, the subject boundary of the science curriculum that privileges science as a way of knowing (3.3.2) is likely to constrain the extent to which science teachers' repertoires can be implemented. But as illustrated in the biotechnology issues repertoire, the stories about environmental and sustainability issues did ironically demand the role of the translator with critical literacy, as exemplified in current stories about climate change issues:

The media backlash is just beginning. [...] Global warming is morphing into 'global boring'. The media, like business, loves novelty. The shift from reporting news responsibly to reporting it in a fashion-driven way, [...] makes for lazy journalists and a lazy public. [...] Being fashionable is not about liberation, it's about the oppression of anything different. It takes a brave media to engage with those scientists at the fore, rather than just *parroting* what is said by the paid mouthpieces for vested interests. (*'Ecologist'* editor, Pat Tomas, 2007; my italics)

Although the argument is concerned with the role of the journalist, it can also be applied to the development of the rhetoric of the teachers' role as translator in dealing with the contingencies and complexities of meanings in popular stories beyond "parroting", by positing a way forward in diversifying the range of repertoires. For example, science teachers' repertoires often drew upon particular views of science, e.g. more established terms, STS (Science-Technology-Society), or science-related discourses such as 'citizen science' or 'science and value', which are not always privileged as the repertoire of science educators. However, it can invite consideration of teachers' critical awareness that conventional science education is just a 'privileged' repertoire constituted by particular modalities of teacher education (Ensor, 2004):

To be able to try a different approach requires some degree of teaching experience, namely, a teacher should be able to 'control' his or her teaching, and have confidence in dealing with pupils' behaviours. Crucially, it takes efforts to be able to understand scientific knowledge within the social context of its development. Until then, I might have thought that good teaching means delivering knowledge to pupils, so as to understand it very 'successfully', and have a good mark in the exam. But I began to think about what content I should teach. Is it right to teach as mandated in the curriculum? I can't ignore the curriculum entirely, but I can capitalise on the space. This year I taught about the so-called 'Hydrogen Economy' at a time when the media was preoccupied with painting a rosy picture about its prospects. (In teaching about this) I began with the scientific principles and information grounded in this issue, and helped pupils discuss its benefits. For preparing the lesson, some books such as "*The miracle of ecological economy*"³⁹, and alternative perspectives available on the Internet and newspapers were useful. (June, J1)

This vignette points to a teacher's awareness that curriculum is not something teachers can simply master; instead, the sense of mastery can be considered part of their critical awareness that the boundary of the subject and teachers' curriculum knowledge is something imposed but can be re-drawn by developing new or other repertoires. "Scepticism" toward/through science suggests the significance of reflexivity in further repertoire-making processes, as exemplified in June's "consumer education" repertoire, and the case of the stem cell research scandal.

Based on the discussion so far, the final point of this chapter is concerned with further applying the repertoire perspective for critiquing the conventional curriculum narratives through a discourse of the 'exemplary' teacher reinforcing the normative practice of teachers' curriculum implementation and limiting curriculum repertoires within the narrowly defined, standard range set by the National Curriculum, along with the performance-driven discourse of achievement. The research on exemplary cases in science teaching in Korea provided useful texts to develop critical intertextual analysis with respect to how science teachers' curriculum narratives as understood in the previous section are interlocked with surrounding stories, such as an exemplary teacher discourse, but with a different discursive effect on the 'boundary' of the curriculum.

The Korean Institute of Curriculum and Evaluation (KICE) conducted a series of research project in 2001-2002 concerning quality educational practice, and the initiatives were aimed at overcoming

³⁹ Translated from German: Alt, F. (2002). *Das ökologische Wirtschaftswunder: Arbeit und Wohlstand für alle*, Berlin: Aufbau-Verlag.

the educational crisis since the late-90s in Korea⁴⁰ by improving teaching quality. Among them, the qualitative analysis of exemplary science teachers investigated the nature and factors of exemplary science teaching practice, based on an analysis of best practices⁴¹, with the aim of examining the policy implications for enabling and spreading such curriculum practices (KICE, 2002). The study introduces seven science teachers' stories about their classroom teaching by emphasising individual teachers' own efforts for professional development. Table 7-2 shows a summary of one exemplary science teaching case – “cooperative learning”, while the other six stories have the same pattern as in the left column.

Table 7-2 A summary of the portrayal of exemplary science teachers (KICE, 2002)

Science teaching through cooperative learning: XXX's case	
Common elements	Extracts from the report
Teacher profile:	XXX's teaching was selected through the recommendation by teacher colleagues. His teaching method is mainly concerned with pupils' cooperative learning through games, and the underpinning idea is that “without pupils' engagement, teaching cannot become effective”.
XXX's view of the current science education in schools:	<ul style="list-style-type: none"> - A lack of pupils' motivation <p>He argued that because pupils do not have motivation for science learning, good lesson plan and preparation does not work. “There are not many elements in science curriculum that can motivate pupils' interest.”</p> <ul style="list-style-type: none"> - The exam stress <p>“The exam scores are made public to teachers, and the content often goes beyond the syllabus.”</p>
The characteristics of XXX's teaching: <ul style="list-style-type: none"> - A conception about 'good teaching' - The aim of science education - Teaching method (Cooperative learning) 	<p>He considered the aim in terms of “fostering pupils' learning motivation and attitude”.</p> <p>“Pupils will come to think that learning science was very interesting”.</p> <p>He found that friends are the most important part of pupils' lives, and thus, cooperative styles can increase their motivation to learn. “Some pupils might not have interest in science learning at all, not alone academic achievement. My method began with the question of what can I do for these pupils? Cooperative learning makes them engage in lesson.”</p>

By portraying seven science teachers' thinking and their classroom teaching practices, the research frames teachers' curriculum narratives within the storyline of ‘exemplary’ teaching practice and teachers' mastery of knowledge of related teaching methods that work effectively. The case of

⁴⁰ They include case studies on exemplary schools (KICE, 2001), and exemplary teachers in key subject areas (KICE, 2002).

⁴¹ The best practices were selected through various channels and advertisements with criteria for definition of ‘exemplary’ in terms of curriculum content knowledge, knowledge about learning, learning environment, assessment, and professional development (KICE, 2002).

exemplary teaching was made by conceptualising a teacher's main curriculum repertoire: 'cooperative learning', 'the use of ICT', 'hands-on activities', 'pupil-centred inquiry', 'real-life issues', 'pupils' curiosity and interest'. Teacher narratives were understood as aligning with the standardised requirements of the science curriculum, especially teachers' mastery of knowledge and provision for examinations. The study concludes that "best practices" such as these teaching methods can contribute to an exemplary model of curriculum practice that can be implemented in other science teachers' practice and other schools (Kwak & Kim, 2002, p.218).

Interestingly, science teachers in this study also stressed the importance of such teaching methods in making the case for their curriculum priorities. For example, 'hands-on activities' were strongly advocated in Han's alternative energy curriculum, while 'real life issues' and 'pupil-centred inquiry' were prevalent in almost every curricular topic. These were also evident in science teachers' strategies by arguing for their professionalism in 6.2.1. However, the difference from 'exemplary teacher' discourse appears in how discourse types such as those teaching methods are combined in new and complex ways, through the articulations of 'good science teaching' in parallel with the rhetoric that environmental education contributes to such good science teaching.

This rhetoric also problematises the framework of 'exemplary' teaching in terms of its capacity to capture the ongoing reflexive characteristics of teachers' action and professional development. For example, Han's alternative energy curriculum might be understood as an 'exemplary' case or "breakthrough" in her own words, given her long experiences and expertise in the NGO, Teachers' STS Group, and school⁴². Instead, Han's repertoire displays the rhetorical features by which she "re-packages" the educational meanings of alternative energy curriculum in the dominant discourses of early education and gifted education. This suggests that even the teaching practice of an experienced teacher like Han is bound up with contradictions in professionalism, roles, and norms, as illustrated by a voice marked by ambivalence, as in 6.1.2.

In contrast, in the 'exemplary' teacher narratives, discourse types such as teaching methods were assumed to have intrinsic pedagogical values within the narrow vision of science education. Therefore, the narrative construction of 'exemplary' science teaching led to the stability of the dominant order of discourse (Phillips & Jørgensen, 2002) and closure in the constitution of the

⁴² Interestingly, during the interview with Han, I was informed that Han had participated in the other research that was concerned with a science teacher's beliefs about teaching about controversial science issues. Based on the in-depth interview with Han and classroom observation of Han's teaching, the study portrayed Han as an exemplary science teacher whose practice was grounded in ongoing reflection on her deeper motivations for education and science teaching (Lee & Witz, 2005).

boundaries of teachers' curriculum repertoires. Of course, the 'exemplary' teachers' actual beliefs about science education could be in parallel with the standard range of repertoires, therefore the main difference between the two teacher narratives are in fact teachers' beliefs about science education, as science teachers in this study tended to stress a critical view of science. However, the point of critique is concerned with the ways in which narratives of 'exemplary' science teaching are told and made true through the order of discourse, with a clear purpose of popularising and disseminating such narratives as a means to quality assurance of teaching practice. Therefore, the two different stories were interlocked with the themes of good teaching methods, but their discursive effects seemed to be oppositional through the different orderings of the discourses: the curriculum boundary is reinforced in the exemplary teacher discourse, whereas the notion of repertoire denotes the range of teachers' action relating to curriculum development and implementation, and hence focuses on the potential for change.

In summary, in this chapter, I have developed a novel approach to teachers' curriculum narratives through offering and integrating a repertoire perspective. The analysis of six curricular topics identified the need to take into account contingencies and complexities in pedagogical meanings by stressing the cultural mediation and influences that form the cultural boundary of resources for teachers' learning, and proposed the teachers' role of translator in dealing with environmental and sustainability issues. This also requires more than 'mastery' of knowledge, even in areas such as science that presume a solid knowledge base. This way of telling teachers' curriculum stories also contributed to a critique of the 'exemplary' teacher discourse.

To conclude, the analyses in Chapters 6 and 7 of the eleven teachers' stories were re-interpreted through developing an investigation into their discursive practices, in which their personal narratives of teaching practice were critically examined. The perspectives of 'rhetoric' and 'repertoire' were used to inform understandings of the ways in which teachers' stories can represent well the reflexive nature of teachers' work and their stories, and might also contribute to a critique of other prevalent teacher narratives such as those of the heroic and exemplary teacher.

But as the analytic frames were generated through the readings of eleven teachers' environmental education, as a case in point, caution is necessary so as not to conflate 'types' of different teachers and teaching practices. For example, the distinction among different subject teachers in 6.2 was not made deterministically, but rather reflected tendencies among the eleven cases. Also, in the case of the six curricular topics, reduction of meanings was inevitable in focusing on the primary concerns and issues that teaching about each topic entailed. The selection of two texts types, the newspapers and the research study, also influenced the further development of discussion in each chapter.

Therefore, the implications of the study's analysis and methods of analysis need to be carefully discussed, by considering different categories and themes, and the scope for making a generalised account as constrained by these features. Along with a wider summary of the thesis, this will be discussed in the final chapter that follows.

Chapter 8. Summary and discussion

❖ Looking ahead

How then can we understand teachers' environmental education through their stories? The study has approached this question through examining unique narrative-discursive approaches to teachers' thinking and practice, based on eleven Korean teachers' stories about their environment-related experiences. In this final part of the thesis, I discuss the significance of narrative inquiry for envisaging teachers' reflective practice and professional learning as meaningful action in addressing environmental and sustainability issues through education.

8.1. Summary and reflection

This section summarises the main arguments of the thesis, with respect to the study's research methods and perspectives, as well as the findings.

8.1.1. Making sense of teachers' environmental education

In understanding the phenomena of school environmental education from teachers' points of view, the thesis has developed methods of analysis concerning teachers' stories about their environment-related experiences, and key perspectives and analyses were presented through three ways of making sense of teachers' environmental education as follows:

- What does engaging in environmental education mean to teachers themselves?
- What does it mean to be/become an environmental education teacher in the current educational context in Korea?
- What are pedagogical meanings of the environment given the role of cultural narratives?

This framework set out to address the teacher's own constructions and perspectives of environmental education that are more than what is conventionally, or formally conceived to be 'environmental education', in ways that not only matter to them but also offer grounds for critique

of some of the assumptions that underpin the current state of environmental education in schools. In so doing, eleven Korean secondary school teachers' stories about their environmental education and environment-related experiences were developed through conversation-based interview methods that helped teachers and the researcher work together to construct and re-story meanings of 'environment-related experiences'.

The idea of plot and formative narratives in Chapter 5 was applied in understanding teachers' environmental education as meaningful practice and action from teachers' own perspectives. Five teachers' life stories of vision and their main themes - 'compass', 'taste', 'learning', 'progressivism' and 'ideal' - illuminated the ways in which engaging in environmental education was closely related to a teacher's sense of continuity in his or her life and career, and theories of action. 'Environmental education teacher identity' then emerged at the intersection of personal life experiences and professional school education contexts, as teachers' identity projects or sense of vision that can reflectively connect, and in this case, story, their past, present, and future.

Based on this emerging frame of reading teachers' stories, the main claim was that: i) the idea of vision can be understood as a metaphorical heuristic, in that its emplotment guides teachers into thinking about and 'planning' what they wish to do to be a 'good teacher', and that, ii) teachers' thinking and practice in environmental education was generally about "doing things more and doing differently", by displaying ongoing reflexivity in their practice and action, which became the study's assumption on teachers' environmental education as creating cracks and ruptures in school education.

But this perspective also raises a question: that is, "If teachers' environmental education is fundamentally situated within self-understandings and personalised vision of education, how do teachers' environmental education become meaningful action, when taking into account the school institutional context and wider cultural narratives of the environment, of which meaning-making systems are beyond teachers' horizons of action and practice?" In developing further analysis to deal with this question, the focus increasingly lay with investigating the meanings of teachers' action and practice by blurring the boundaries of personal and professional identities. In this way, Chapters 6 and 7 are illustrative of the cases of blurred boundaries - professionalism and curriculum, respectively, through which teachers' environmental education can create cracks and ruptures in school education.

In Chapter 6, teacher narratives were analysed in terms of their rhetorical strategies in making arguments regarding why environmental education is a valuable thing to do in the current school

education. Teachers' rhetoric was mainly concerned with envisioning professionalism in the school institutional context, as follows:

- By moving in-between spaces of good/odd teacher (science teachers);
- By gaining a niche status (humanity teachers); and,
- By seeking a new kind of specialism (Environment teachers).

Meanwhile, the differences among the groups and individuals in their beliefs and arguments about 'environmental education teacher' identities were also made evident. But further examination of narrative styles, not just content, enabled a rendering of the ongoing dialectical relationship between individuals (e.g. teachers' personal beliefs and preferred teaching approaches) and structures (e.g. the National Curriculum, and subject division), informed by a constructionist point of view (see 3.1.2. and 3.3.2). As such, in arguing for teacher professionalism, their thinking and practice was seen to be not complete but constantly at work, i.e. identity work, in ways that revealed the paradoxes of institutional demands and teachers' living through these.

Another aspect of the analysis of their discursive practices was concerned with the meaning-making processes of teachers' environmental and curriculum knowledge, and how environment-related cultural narratives play out in the construction of pedagogical meanings. The perspective of 'repertoire' was developed to denote both teachers' acts of prioritising and resourcing their concerns and knowledge for curriculum development. But teachers' repertoire-making processes as constructing pedagogical meanings of the environment were mediated through the cultural boundaries of resources and learning, often impinged upon by dominant cultural narratives related the environment and science. Six curricular topics - alternative energy, environmental issues, health and 'well-being', biotechnology issues, outdoor education and green education - were then analysed in terms of particular pedagogical issues, by exploring how these were related to the cultural processes that impinged not only on teachers' own preconceptions, but also those of pupils and other teachers, about environmental issues and related cultural phenomena.

Through this, the contingencies and complexities in their pedagogical renderings of environment-related issues and cultural concerns were highlighted, and the teacher's role as 'translator', as teachers' repertoires were diversified and didn't just imitate the standard range of curriculum available, was explored. For example, science teachers' reflexive attitudes and scepticism toward science-related stories suggested that expanding curriculum repertoires beyond conventional science education required teachers' critical translation of cultural topics, e.g. 'through' science and 'about' science.

To sum up, the thesis demonstrated how teachers' environmental education can be understood through stories, by developing theoretical and conceptual tools for reading teachers' stories and addressing further issues in examining and creating meanings of environmental education teacher identities.

In this way, while the inquiry's focus lay on developing teachers' stories and analysing them concerning three aspects in relationship between teachers' environmental education and the idea of teacher identity, it should be recognised that the stories were also concerned with the Korean educational and cultural context, not only in the sense that stories reflect the particularities of culture, but also in that storytelling and stories represent the dialectical relationship between individuals and the larger context. Throughout the research process, some elements of the particularities of Korean culture and education were illuminated including the rigid national curriculum system and 'exam-hell', teachers' experiences of the student movement, and environment-related 'issues'. Teachers' stories then seemed to be both enabled and limited by such cultural operations, and in this, the study's contribution was to develop methods of analysis for demonstrating how the phenomena of environmental education can be interpreted through telling teachers' own stories. However, it remains for further research inquiries to be conducted as to how identifying cultural elements and processes that shape teachers' environmental education can inform further ways of forming discourses that are necessary for mobilising cultural resources and power toward addressing the collective vision of education.

The study's limit should also be noted. As addressed throughout the chapters (see particularly 4.1.2), the study's design solely relied on eleven teachers' environmental education and stories. Although a small-scale study such as this has its own strength in developing in-depth understandings and analyses of teachers' interpretations of environmental education, caution is also required so as not to generalise the research's 'findings' or take them as 'representing' the current state of school environmental education in Korea. Indeed, teachers' stories in this study are particular stories whose common meanings were investigated in terms of their potential for critiquing taken-for-granted assumptions and knowledge in teacher identity, professionalism and curriculum.

For example, the choice of five teachers among all eleven teachers in constructing vision stories in Chapter 5 was mainly indexed to the possibilities for depth in the interviews, and by doing so, vision stories appear to have directed readers' attention to teachers' social activism, particularly the student movement experience. While my interpretation focuses on how those experiences are given significance through teachers' reflection, however, it remains unexplored as to how the wide

spectrum of teachers' social activism (whether through radical student movements or more moderate personal environmental activism in ways that reflect cultural histories and changes) might contribute to teachers' ongoing motivation for environmental education, and hence more stories about professionalism and curriculum that go beyond the range in Chapters 6 and 7. This concern gives credit to full development of life histories or personal narratives for the design of research that the methods and concepts used in Chapter 5 are partly concerned with, in ways that offers further insights into the role that teachers' life experiences play in enriching teachers' stories about their vision of education.

8.1.2. Teacher narratives as action

In developing research inquiries into teachers' environmental education through their stories, the methodological assumptions in the narrative-discursive approaches were concerned with narrative as discourse and as constructing social meanings. Telling teachers' stories about environmental education through research was then aimed at more than 'describing' how things are, by investigating how stories 'perform' social actions within specific socio-cultural milieu. Therefore, the themes and content of teachers' stories such as vision, identity, professionalism, and curriculum could be examined in terms of their roles in constructing meanings or meaningful actions within the wider or particular contexts of cultural and institutional narratives.

The study has developed unique narrative-discursive approaches to teachers' thinking and practice: that is, teacher narratives in the data analysis chapters were further located alongside other narratives of teachers, in order to investigate the meanings acquired from the story's surrounding their cultural and linguistic conditions. The assumption was that personal narratives are implicated in several stories in ways that interlock with other stories 'beyond' one's own life. In each chapter, the relationship between teachers' personal narratives and other narratives of teachers was laid out in a variety of ways, but the common concern was to elucidate the meanings of personal narratives as 'small' stories in terms of their critiquing role of surrounding, 'larger' institutional and cultural narratives.

In Chapter 5, relating to vision narratives, the use of students' readings of teachers' stories intended to engage with the methodological concern about authenticity in legitimatising teachers' life experiences as meaningful aspects of teachers' thinking and practice. By examining experiential and theoretical frames of reference, normative assumptions about the teachers' role and responsibility were challenged, and instead, the idea of 'identification' was proposed as an

intersubjective method for engaging teachers' stories as they are meaningful to the teachers themselves. My own understanding and writing of vision narratives was an outworking of this method.

The subsequent two chapters drew on other text sources, media reports and research reports, to develop a critical analysis of the dominant discourses impinging on teaching practice, with a specific focus on the institutional and cultural boundaries of meaning-making systems and processes. In Chapter 6, substantial evidence for critiquing the media's construction of environmental education teachers as extraordinary teachers was provided based on teachers' arguments about their professionalism, and interpreted in terms of reflexive identity work processes. Thus, the analysis of the teachers' rhetoric posited environmental education as a continuous learning process of seeking other and possible meanings of teacher identity and professionalism, in that institutional barriers and recognised 'gaps' were the very sites where such reflection and learning could take place.

In Chapter 7, the features of contingencies and complexities in environmental curriculum knowledge, grounded in the analysis of teachers' curriculum narratives, provided clues for critiquing the mastery discourse of teacher knowledge popularised through the exemplary teacher narratives. Comparisons made between two stories about teachers' curriculum development illustrated how they might be interlocked with the themes of 'good teaching methods'. But their discursive effects seemed to be rather oppositional through the different orderings of the discourses: the curriculum boundary is reinforced in the exemplary teacher discourse, whereas the notion of repertoire denotes the range of teachers' action relating to curriculum development and implementation, hence focuses on the potential of change.

Therefore, the two cases can be regarded as offering an exploration of the potential of teacher narratives to be seen as tools for opening up discursive spaces for alternative meanings of professionalism and curriculum, in contrast to normative and meaning-fixing narratives such as the heroic teacher 'character' and exemplary teaching. By developing distinctive research inquiries and approaches such as this, the aim was to explore often implicit and tacit characteristics of teachers' knowledge and knowing in and about environmental education. Therefore, it is argued that teachers' participation in environmental education is deeply grounded in the individual teachers' own contexts of learning and action, and therefore, understandings of teachers' knowledge and values should acknowledge the possibility that they are composed through blurrings, mixings, and contestations of elements of their personal and professional contexts.

In terms of epistemological and methodological assumptions, reading teachers' stories of vision (Chapter 5) involved offering accounts that illustrate the narrative 'authority' of teachers' own voices, with the intention to illuminate the meanings created through teachers' narrative knowing and expression. In contrast, a more sceptical attitude to teachers' stories themselves was necessary in the subsequent Chapters (6 and 7) in developing analytical perspectives that stressed the actualities of teaching practice, through reading beyond the context of storytelling by/with teachers. Therefore, the thesis has explored the value of teacher narratives in understanding symbolic action and performance, by crafting new meanings of teacher identity, professionalism, knowledge and curriculum.

Therefore, the inquiry focus lay distinctively on understanding and analysing teachers' stories and exploring the value of personal narratives in conjunction with other stories about teachers in ways that are concerned with the question of which stories to tell about teachers' environmental education. Meanwhile, less attention was taken to directly address the relationship between EE or ESD related discourses and teachers' own stories. This was in part due to the study's interest in knowing the ways in which teachers make sense of their environment-related experiences, and as the interview design aimed to elicit stories oriented to teachers' ways of thinking and knowing. In so doing, it became evident that stories about environmental education were bound up with some of the very fundamental questions about how teacher's work should be defined and where the legitimate boundaries are. While this study's contribution is in the ways that such perspectives on the value of personal narratives can be developed, complementary to this is to develop an analytic framework with which to explore how the meanings and arguments that support teachers' thinking and experiences are mapped onto the range of discourses that EE or ESD is concerned with.

So far, the main arguments of the thesis have been presented in terms of the methods of analysis and the three different ways of understanding and analysing teachers' stories of environmental education. The rest of the chapter discusses how these particular stories of teachers and ways of telling teachers' stories can gain significance for an understanding of teachers' environmental education beyond the context of the analyses so far. The discussion is also an exploration of possible responses to Stevenson's (2007b) call for driving shifts from the discourses of policy toward the discourses of professional learning in environmental education research and practice, in order to build up professional capacities and educative visions in school environmental education.

8.2. Implications for teacher learning and narrative inquiry

8.2.1. Teacher narratives and learning

[T]he pedagogy argued for and the pedagogy of the argument of the teacher narratives we typically celebrate in both scholarly and popular cultural realms tend not to serve as a site for investigation into one's own teacher learning, but as a way to redeem teaching as a heroic practice and the teacher as a hero. They do not depict the teacher as struggling. . . . Any moments of messiness are to be cleaned up and polished by the story's end. The teacher is expected to discover or return to a unified and authoritative position - to show him- or herself as finally "trained" or "oriented." These narratives ultimately lead to closure, presenting the teacher as the victor - as finally finished learning or "training" - with the students benefiting from the teacher's decisiveness and rigor. (Stenberg, 2005, p.71)

What are the contributions that narrative inquiry can make to generating teacher learning theories? With Stenberg's concern, during my own research process of understanding teacher narratives, dilemmas have occurred concerning deciding on how narratives take on significance without falling into the 'ending' of the stories. In developing research accounts of 'understandings' and 'analyses', the study sought to recognise and sensitise the contexts and processes in which meanings of teachers' action and struggles are constructed. Therefore, discussion on the study's 'findings' - the conceptual frames and perspectives as well as contents of the stories - concerning teacher learning is intended to explore further the values of narrative inquiry as a way of generating "provisional models" (Doyle, 1997) of teacher learning and professional development.

Teacher narratives can be a useful tool for understanding teachers' action as constituted by personal motivation and commitment and for legitimatising teachers' knowledge formed through these means. The idea of 'narrative identity' is crucial in examining the formative influences of teachers' personal lives and socio-cultural contexts, and the pathways and tracings in which teachers' motivation and commitment are formed. In this study, vision narratives, or vision as metaphor ('the ability to see and plan for the future'), seemed to be a vital element in teachers' stories where environmental education became sustained practice, and an essential part of their professional development. The claim can be supported by five teachers' life stories displaying more of a sense of continuity and agency although their actual action and practice were varied. In this, not only individual experiences of lives and teaching but also cultural and collective experiences were reconstructed through reinterpretation. In teachers' stories, the contemporaneity of environmental and cultural issues in the Korean context played an important role in the constitution of teachers'

curriculum repertoires, by forming cultural frames of interpretation and understanding of subject matters and pedagogical knowledge. Likewise, teachers' experiencing and remembering key events and phenomena such as the student movement and democratic social changes were part of narrative identity construction that enriched their professional journey through learning.

Therefore, narrative understanding of teacher learning can add to the significance of the narrative quality of experience, such as illustrating the temporality in teachers' reflections (Clandinin & Connelly, 2000), and augmenting other models and metaphors of professional development such as 'growth' or 'change' (e.g. Clarke & Hollingsworth, 2002), particularly when this is primarily concerned with teachers' learning about *action*. In other words, teachers' sense of agency is not only grounded in their level of knowledge acquisition and the actual changes they have made, but can also be tightly bound up with their narrative constructions of the past, present and future in ways that self-nurture progressive and hopeful mindsets, e.g. by "doing things more and doing differently".

Here, the metaphor of teachers' 'inquiry as stance' put forward by Cochran-Smith and Lytle (1999) offers a conceptual bridge between narrative knowing and action learning:

In our work, we offer the term inquiry as stance to describe the positions teachers and others who work together in inquiry communities take toward knowledge and its relationships to practice. We use the metaphor of stance to suggest both orientational and positional ideas, to carry allusions to the physical placing of the body as well as to intellectual activities and perspectives over time. In this sense, the metaphor is intended to capture the ways we stand, the ways we see, and the lenses we see through. Teaching is a complex activity that occurs within webs of social, historical, cultural, and political significance. Across the life span, we assert that an inquiry as stance provides a kind of grounding within the changing cultures of school reform and competing political agendas. (Cochran-Smith & Lytle, 1999, pp.288-289)

The idea of 'environmental education teacher identity' in this study captures different ways in which teachers could 'stand' or be oriented toward professionalism and curriculum over time, in relation to meaningful productions for/of identity. In this, concepts such as 'plot', 'rhetoric' and 'repertoire' were the narrative forms that represented the dialectical processes in which teachers came to inquiry into the boundaries that articulated who they were and where they belonged, and to think progressively about who they could otherwise be. Teachers' professional and pedagogical knowledge formed through this is essentially reflexive, grounded in the dialectical processes of knowing and teaching and identity construction. This can be further conceptualised from the

perspective of ‘knowledge *of* practice’ that is differentiated from both formal knowledge (knowledge *for* practice; implementer teacher image) and practical and craft knowledge (knowledge *in* practice; competent/exemplary teacher image), in that teaching ‘practice’ is expanded to a ‘larger’ context (Cochran-Smith & Lytle, 1999). Indeed, the teachers’ curriculum narratives in Chapter 7 highlight that curriculum practice is embroiled in the cultural meaning-making systems beyond pedagogy, therefore teachers’ knowing and repertoire-making cannot be detached from such larger contexts.

This feature of teacher learning in a way conjures up an image of the activist teacher (Sachs, 2002). However, whereas Sachs’ proposal of activist identity was based on the clear democratic and emancipatory aims of school education, in opposition to managerial discourses, teachers’ environmental education as action in this study does not clearly denote such directions for teacher profession and education, as evidenced in the science teachers’ different interpretations of ‘critical’ inquiry. Cochran-Smith and Lytle (1999) also note different conceptions of teacher image that inquiry as stance learning is associated with. Teacher learning understood through stories might not be directly about certain images and types of teacher, but instead points to reflexive sense-making processes that teachers engage in, as Sachs (2001) argues for the importance of teachers’ self-narratives - “stories of stories” that are reflexively developed and embedded in the course of their professional lives, and borrowing Gergen and Gergen’s idea that:

Narratives are, in effect, social constructions, undergoing continuous alteration as interaction progresses... the self-narrative is a linguistic implement constructed by people in relationships to sustain, enhance or impede various actions. Self-narratives are symbolic systems used for such social purposes as justification, criticism and social solidification. (Gergen & Gergen, 1988, pp.20-21; cited in Sachs (2001, p.157))

This conception of narratives in relation to learning suggests a role of teacher narratives as vehicles for examining the nature of action that is continuously altered and progressed through social relationships, and therefore nurturing how to learn to deal with paradoxes and tensions emerging from different meanings of professional identities, knowledge, and curriculum, and this also in the face of contingencies and complexities that environmental and sustainability narratives entail.

But then, how can teacher learning be facilitated in ways that address the goals of envisaging ecological and sustainable lives and society? Previous studies have addressed the need to support teachers’ learning, with their focus primarily on the cognitive dimension such as environmental and sustainability related conceptions and knowledge or programme models and approaches (see 2.2.1).

The contribution of this study's narrative inquiry has been to illuminate reflexive identity construction processes by assuming teacher narratives act as symbolic action for producing more diverse conceptions about teacher identity, by deconstructing the cultural archetypes that are givens and pervasive as evidenced in teacher narratives of self-identity, professionalism and curriculum repertoires.

Meanwhile, the like-mindedness among the teachers in teachers' groups, along with teachers' critiques of the pervasive cultures of teachers and their isolations, suggest that such teacher identity is deeply related to teachers' personal beliefs and dispositions, rather than fostered through teachers' socialisation. Although the study's inquiry methods illuminated the personal boundary of teachers' action and learning, recognising the values of personal narratives in terms of their rhetorical and symbolic strategies takes us into considering what kind of learning discourse is possible and necessary in establishing environmental education in schools. My concern then in the following section is how to develop the teacher discourse of environmental education in ways that contribute to educational practice, beyond the discourse of 'mainstreaming' environmental education into school education (see 2.1).

8.2.2. Environmental education as a catalyst for teacher learning

In the history of environmental education research, theoretical developments in environmental education were often driven by different epistemological and ideological assumptions (e.g. Robottom & Hart, 1993; Huckle & Sterling, 1996). The virtue of such idealistic discourses of environmental education is to provide theoretical underpinnings for designing curriculum, or facilitate a critical examination into one's current curriculum practice by comparing and contrasting values, assumptions, and limits that each perspective underscores. For example, in this study, Environment teachers' references to some normative discourses such as teacher 'neutrality' or 'behaviour change' (see 6.2.3) point to the ways in which teachers' theoretical knowledge, acquired through 'environmental education' pre-service curriculum, encounters actual teaching and learning situations. Studies of teachers' stories about curriculum development and practice also show ample evidence of how teachers' personal practical theories are often constructed in relation to the negotiation or gaps between teachers' beliefs and action (see 2.2.1 and 2.2.2), and multiple perspectives and literacies (Scott & Oulton, 1999; Scott & Gough, 2003), acquired through teaching experiences. But this evidence also reveals the limits of the idealistic discourse of environmental education in overcoming the rhetoric-reality gap in schools (Stevenson, 1987; Stevenson, 2007a).

As teachers and teacher educators, we might want to know some normative pathways of professional development or “what works” - scenarios, beyond understanding individual cases and particulars of contexts. For example, at the initial phase of the inquiry, my interest still lay in how to identify ‘better’ or ‘right’ methods and approaches to environmental education by understanding teachers’ knowledge. The value of narrative inquiry then was also understood as concerning the ‘power’ of practitioners’ narratives (see also 1.1.2), with an expectation of their oppositional relationship with conventional or dominant approaches to environmental education, and therefore leading to an ‘alternative’ or ‘innovative’ model that is better suited to teachers’ concerns and educational purposes. With this interest in the normative value of narrative inquiry on the one hand, on the other the inquiry processes encountered ambiguity and ambivalence in teachers’ narratives and voices that featured teachers’ ongoing struggles. My analytical strategies then were concerned with developing teacher narratives and analyses of them in ways that revealed the tensions in meaning construction by locating them alongside particular discourses of teacher identity, e.g. the heroic teacher in Chapter 6 and exemplary teacher in Chapter 7. In both chapters, teacher narratives were analysed in terms of their rhetorical value: the ways in which teachers developed persuasive and self-convincing arguments about their environment-related teaching.

While teachers’ struggles and limits in action were evident, the main rhetoric that underpinned their reasons to engage in environmental education emerged, concerning the question of “how does environmental education contribute to educational practice?” In other words, “doing things more and doing differently” points to teachers’ action and strategies for action toward enacting ‘good education’ as they defined and hoped for it. In this, teachers’ definitions of ‘environmental education’ were not fixed, but flexible as their ongoing reflexive identity work appears to signify. Three cases of analysis in Chapter 6 demonstrated how teachers came to define environmental education in terms of their specialism and subjects. For science teachers, what they did is more than environmental education, and importantly related to teachers’ continuous effort to get closer to the ideals of good education through science teaching. The two humanity teachers’ environmental education practice took place outside their classroom teaching, as they sought spaces to do so. The case of the Environment teachers showed how ‘environmental education’ in schools is received and implemented. When ‘survival’ is the key concern for teachers, ‘environmental education’ was something that teachers had to find reasons to teach. But their professionalism appeared as they began to talk about the ways in which they contributed to school education. With different concerns and expertise then, institutional barriers and recognised ‘gaps’ were the very sites where teachers’ reflection and learning took place as they became ‘environmental education teachers’.

Teachers' arguments about their professionalism as environmental education teachers were then clearly a different form of rhetoric to both the idealistic view of environmental education and the rhetoric-reality gap discourse noted earlier, which presupposes normative definitions of environmental education - why environmental education should be part of school education and what are the best ways for achieving this. In contrast, in teachers' actual practice, key concerns lay in the contribution that they made, both materially: real changes such as curriculum space and approaches, and symbolically: challenging the boundary of teachers' work and professionalism. But caution is required for examining the potential of teachers' rhetoric to develop a teachers' learning discourse, in that teachers' narratives do not necessarily presuppose 'better' visions and practices of education. Rather than romanticising teachers' stories and assuming them of equal value, the critical focus of the examination into teachers' narratives developed in this study was concerned with the ways in which teachers' professionalism and curriculum repertoires revealed educational issues as well as created spaces for making changes. For example, the analysis of the six curricular topics identified the issues of contingencies and complexities inflected in the processes in which individual teachers take up and interpret the cultural meanings of environment-related issues and phenomena. Therefore, the teachers' contribution to education through environmental education was concerned with raising a critical question about how teachers' role can be redefined, e.g. 'translator', in dealing with environmental and sustainability issues, and not simply interpreted in the conventional framework of exemplary teaching criteria or curriculum boundaries.

In this way, the thesis has demonstrated how teachers' narratives of environmental education can be developed and analysed in ways that contribute to educational practice by pushing the limit of the standard of what counts as education in schools, rather than simply meeting it. In this respect, the rhetoric of environmental education as contributing to school education should be regarded as distinct from the mainstreaming discourse of environmental education that is aimed at using environmental education as only a vehicle for meeting educational standards, e.g. "closing the achievement gap" in the US, and therefore limiting the educative possibilities that the purposes of environmental education promise (Lieberman & Hoody, 1998; Gruenewald & Manteaw, 2007). While teachers' actions were clearly limited in achieving teachers' ideals, tales about ideals and vision were useful sense-making tools for envisaging what was possible and necessary for better education. This implies that the learning discourse for teachers' environmental education can be developed in ways that narrow the gaps between the normative discourse of EE or ESD: "what should be done", and teachers' rhetoric for action and reasons for engaging in environmental education.

Concerning this, the Environment teachers' "survival" stories (see 6.2.3) illustrated how novice teachers' stories contributed to the forming of their professional identities and professionalism. Environment teachers' narratives of struggles as beginning teachers suggest that teachers' vision(s) of their careers are not necessarily conveyable through institutional mechanisms, but should be actively pursued by individual teachers themselves. With more teaching experiences and more extended curriculum repertoires, Environment teachers might begin to tell more competent 'vision' stories. Of course, given the low status of the Environment subject, a direct comparison between Environment and other teachers such as science teachers is not possible for predicting their professional development journey. Yet, it can still be asked what the role of their stories such as "survival" is, as teachers continue to live through the institutional demands of schooling. In this regard, some rhetorical strategies that Environment teachers began to develop point to their futures-oriented attitude toward their career. For instance, when Nam said to pupils that, "It (environmental education) is like having a taste of coffee" (see p.226), in explicating his own way of convincing pupils why environmental education is valuable, it was about making promises to pupils in a metaphorical sense; that is, once pupils begin to know what environmental education is through his teaching, their active participation in learning will follow naturally. But it was also about making promises to himself that he would improve his teaching and becomes a good and confident teacher in the future. Also, Hee's metaphor of "oasis" (see p.226) symbolises the ways in which she began to conceptualise a new kind of specialism as Environment teacher beyond stereotypical images that had hindered pupils' motivation towards the environmental learning.

My final point regarding ways of helping teachers to engage in environmental education in schools is concerned with organisational learning processes in schools and between schools and other communities. Teachers' stories in this study can connote school environmental education as more individualised or balkanised than shared through organisational supports: largely as depending on enthusiastic individuals. Teachers' different strategies for professionalism in Chapter 6 illustrated three different ways available for teachers to become environmental education teachers in schools in terms of personal identity strategies. Even in the case of Environment teachers whose profession was initiated through a policy intervention, envisioning their career was left to the teacher's own devices. However, in spite of the limit of the research focus that was only concerned with personal narratives, the study has sought to challenge the fixation of teacher characters, as 'hero', 'extraordinary', 'exemplary', that only consolidates individuals as actors, but not organisation or collective culture as possibly more powerful one, by seeking the value of teachers' narratives in critiquing such dominant narratives that predominantly stress the instrumental role of teachers in professionalism and curriculum. Teachers' stories in this study do not readily present other metaphors that signify collective action or professional identity development, such as related to

alliance or network, and this needs further research. However, the research identifies teachers' strong need for learning and sharing, e.g. through teachers' groups, NGOs, and local communities, in ways that broaden their own horizon of knowing and experience. Also Kim's green education repertoire implies that a bottom-up action can form a 'teacher discourse' by gaining the discursive power of what alternatives to the current national curriculum structure are possible and available.

In this sense, the study has identified some scenes of school environmental education enacted by teachers, as 'seeds' that have been germinated and spread throughout the history of environmental education in Korea. To look ahead, teachers' grass root efforts and action should receive policy and institutional support. In this, a recent policy breakthrough in the legislation of an "Environmental Education Promotion Act" heralds brighter prospects for widespread support of environmental education. However, there is already a cautious voice emerging, in that the standardisation of environmental education favoured by policy processes might undermine creative and experimental thinking and energies that have upheld environmental education (KEEN, 2008). In this respect, critical inquiries into teachers' personal narratives are crucial in informing the ways in which individuals' learning and action can progress by maintaining a constructive tension with institutional and organisational processes. For example, the study's thesis that teachers' rhetoric of the contribution to education through environmental education is the key to their action and practice suggests that any policy initiatives for 'environmental education' or 'education for sustainable development' in schools should lead and support individual teachers' vision(s) of education in general, so that more teachers can be encouraged to learn and become motivated to envisage their professionalism, e.g. by diversifying the definitions of 'environmental education teacher' and their repertoires, rather than impose discrete sets of programmes and demands for curriculum implementation that might only reinforce the stereotypes of environmental education as just assigned extra duties.

8.2.3. Agendas for narrative inquiry

In the previous sections, I have discussed the contribution of teacher narratives and narrative understanding of teaching to further theorising teacher learning, based on the findings of the study. This section addresses other themes of and approaches to narrative inquiry for future studies.

Firstly, as pointed out in the previous section, an understanding of teachers' environmental education needs to be expanded from the personal level of action and learning context into an organisational learning process in schools and between schools and communities. The themes of

‘other teachers’ and stereotypical images about environmental education teachers in schools, as opposed to ‘like-minded teachers’ whose relationship developed outside the boundary of school work in this study, hints at the significance of organisational learning processes which are not easy to trigger without institutional and cultural changes (e.g. Kim, 2007). However, the study also demonstrates the potential of narrative inquiries into the relationship between learning, agency, and identity, and particularly, the reflexive processes of forming environmental education teacher identities. Identity can also be a key concept in understanding socio-cultural and discursive processes in which organisational learning takes place.

Concerning this, Hart (2007) observes the shifts in action research in the ENSI (Environment and School Initiatives) Programme, from a focus on teachers’ and pupils’ practical experiences and critical reflection, to their stories as discursive constructs and identity as narratives. Stories about collaboration, partnership, network, change, agency, stakeholder, etc. that are considered to be composed of organisational learning can be critically examined as discursively constructed or in terms of performativity, by reflecting on how such conceptions prefigure people’s experiences and knowledge. For example, how might stories about change that policy-oriented initiatives promote constitute teachers’ stories of vision? Also, how can ‘collective storytelling’ be possible in an organisational and social learning process, and subsequently, how can learning be conceptualised, given the different power, knowledge and authorities among people?

Secondly, there needs to be more variety in the research approaches to ‘larger’ cultural and environmental narratives that may impinge on educational processes. The study’s use of teachers’ stories alongside other stories about teachers was intended to examine the meanings within the larger socio-cultural narratives and discourses of teachers’ role and work in a society, such as the heroic and exemplary teacher, and in doing so, teachers’ action and agency could be examined in terms of reflexive processes. Also, critically reading cultural historical narratives of environmental and science-related issues in Korea was crucial in identifying contingencies and complexities that are inflected in teachers developing their repertoires. In such ways, the role of culturally or globally produced narratives in framing people’s minds and consciousness needs to be further examined through different methods of collecting data, i.e. ‘text’ as well as different genres and styles of inquiry and writing in ways that interrogate taken-for-granted assumptions and truth claims that underpin the ideas of ‘education’, ‘pedagogy’, ‘learning’, etc. In order to do this, more conceptual and analytic tools with which to read stories and interpret meanings are needed together with epistemological and methodological reflexivity.

*“Life can only be understood backwards, but it must be lived forwards.”
(Søren Kierkegaard, cited in Habermas, 2003, p.4)*

Looking back and ahead, I note that the meanings of narratives are time and culture bound. I wonder how teachers’ stories might evolve over time or how they might be told differently now, given Korea’s cultural and social dynamics and uniqueness, and reflexive processes in which teachers’ stories are constructed. ‘Vision’ will be revised and retold as their lives proceed. In the same way, societal visions for education or environmental education will need to be reflexively reformulated over time. To conclude, for the prospects of environmental education and education for sustainability to which social and reflexive learning is central, the challenging role for narrative inquiry will be to develop critical interpretive tools with which to generate educational possibilities from the storied-processes of lives and sustainability.

BIBLIOGRAPHY

- (AAAS) American Association for the Advancement of Science (1990). *Science for all Americans*. New York: Oxford University Press.
- Abd-El-Khalick, F., & Lederman, N. (2000). Improving science teachers' conceptions of nature of science: a critical review of the literature. *International Journal of Science Education*, 22, 7, 665-701.
- Acker, S. (1995). Carry on caring: the work of women teachers. *British Journal of Sociology of Education*, 16, 21-36.
- Acker, S. (1995-1996). Gender and teachers' work. *Review of Research in Education*, 21, 99-162.
- Agelidou, E., & Flogaitis, E. (2003). Kindergarten teachers' conceptions about nature and the environment. *Environmental Education Research*, 9, 4, 461-478.
- Alsup, J. (2006). *Teacher identity discourse: negotiating personal and professional spaces*. NCTE-LEA research series in literacy and composition. Mahwah, N.J.: L. Erlbaum Associates.
- Alters, B. J. (1997). Whose Nature of Science? *Journal of Research in Science Teaching*, 34, 1, 39-55.
- Alt, Franz (2002). *Das ökologische Wirtschaftswunder: Arbeit und Wohlstand für alle*, Berlin: Aufbau-Verlag. [The miracle of ecological economy]
- Aoki, T. (1983). Experiencing ethnicity as a Japanese Canadian teacher: reflections on a personal curriculum. *Curriculum Inquiry*, 13, 3, 321-335.
- Ashley, M. (2000). Science: an unreliable friend to environmental education? *Environmental Education Research*, 6, 3, 269-280.
- Atkinson, R. (2002). The life story interview. In J. F. Gubrium & J. A. Holstein (Eds.), *Handbook of interview research: context & method* (pp.121-140). Thousand Oaks, Calif.: Sage Publications.
- Appleton, K. (2003). How do beginning primary school teachers cope with science? Toward an understanding of science teaching practice. *Research in Science Education*, 33, 1-25.
- Bakhtin, M. (1981). *The dialogic imagination*. Ed. M. Holquist. Trans. C. Emerson & M. Holquist. Austin, TX: University of Texas Press.
- Bakhtin, M. (1986). *Speech genres and other late essays*. Ed. C. Emerson & M. Holquist. Austin: Texas University Press.
- Ball, D. (1972). Self and identity in the context of deviance: the case of criminal abortion. In R. A. Scott & J. D. Douglas (Eds.), *Theoretical perspectives on deviance*. New York: Basic Books.
- Ball, S.J. (1998). Performativity and fragmentation in 'Postmodern Schooling'. In J. Carter (Ed.), *Postmodernity and fragmentation of welfare*. London: Routledge.
- Bamberg, M. G. W. (1997). Positioning between structure and performance. In M. G. W. Bamberg (Eds.), Oral versions of personal experience: three decades of narrative analysis (special issue). *Journal of Narrative and Life History*, 7, 335-342.
- Barker, C., & Galasiński, D. (2001). Cultural studies and discourse analysis a dialogue on language and identity. London: SAGE.
- Barone, T. (1997). Among the chosen: a collaborative educational (auto)biography. *Qualitative Inquiry*, 3, 2, 222-236.
- Barrett, M. J. (2005). Making (some) sense of feminist poststructuralism in environmental education research and practice. *Canadian Journal of Environmental Education*, 10, 79-93.
- Barrett, M. J. (2006). Education for the environment: action competence, becoming, and story. *Environmental Education Research*, 12, 3, 503-511.
- Barrett, M. J. (2007). Homework and fieldwork: investigations into the rhetoric-reality gap in environmental education research and pedagogy. *Environmental Education Research*, 13, 2, 209-223.

- Barrett, M. J. (2008). Participatory pedagogy in environmental education: reproduction or disruption? In A. Reid, B. B. Jensen, J. Nikel & V. Simovska (Eds.), *Participation and learning* (pp.212-224). New York: Springer.
- Bassey, M. (1999). *Case study research in educational settings*. Buckingham: Open University Press.
- Beck, U. (1992). *Risk society towards a new modernity*. London: Sage Publications.
- Beijaard, D., Meijer, P. C., & Verloop, N. (2004). Reconsidering research on teachers' professional identity. *Teaching and Teacher Education*, 20, 107-28.
- Bell, A. (2003). A narrative approach to research. *Canadian Journal of Environmental Education*, 8, 95-110.
- Berger, P. L., & Luckmann, T. (1966). *The social construction of reality: a treatise in the sociology of knowledge*. Garden City, N.Y.: Doubleday.
- Bernstein, B. (1996). *Pedagogy, symbolic control and identity: theory, research, critique*. London: Taylor & Francis.
- Biklen, S. K. (1995). *School work: gender and the cultural construction of teaching*. Albany: State University of New York Press.
- Blackburn, A. M. (1983). Steps along the Path: the UNESCO/UNEP International Environmental Education Program. *The Environmentalist*, 3, 4, 269-276.
- Blumenfeld-Jones, D. (1995). Fidelity as a criterion for practicing and evaluating narrative inquiry. In J. A. Hatch & R. Wisniewski (Eds.), *Life history and narrative* (pp.25-35). Qualitative studies series, 1. London: Falmer Press.
- Boje, D. M., Alvarez, R. C., & Schooling B. (2002). Reclaiming story in organization: narratologies and action sciences. In R. I. Westwood & S. Linstead (Eds.), *The language of organization* (pp.132-175). London: SAGE.
- Booth, W. C. (1979). *Critical understanding: the powers and limits of pluralism*. Chicago, IL: University of Chicago Press.
- Breiting, S., Mayer, M., & Mogensen, F. (2005). *Quality Criteria for ESD-Schools: guidelines to enhance the quality of Education for Sustainable Development*. Austrian Federal Ministry of Education, Science and Culture, Vienna, Austria.
- Britzman, D. P. (1991/2003). *Practice makes practice: a critical study of learning to teach*. Revised ed. Albany: State University of New York.
- Brockmeier, J. (2000). Autobiographical Time. *Narrative Inquiry*, 10, 1, 51-74.
- Brockmeier, J., & Carbaugh, D. (2001). Introduction. In J. Brockmeier & D. A. Carbaugh (Eds.), *Narrative and identity: studies in autobiography, self, and culture* (pp.1-22). Studies in narrative, v. 1. Amsterdam: John Benjamins.
- Brockmeier, J., & Harré, R. (2001). Narrative: problems and promises of an alternative paradigm. In J. Brockmeier & D. A. Carbaugh (Eds.), *Narrative and identity: studies in autobiography, self, and culture* (pp.39-58). Studies in narrative, v. 1. Amsterdam: John Benjamins.
- Bruner, J. (1986). *Actual minds, possible worlds*. Cambridge, MA: Harvard University Press.
- Bruner, J. (1987). Life as narrative. *Social Research*, 54, 11-32.
- Bruner, J. (1991). The narrative construction of reality. *Critical Inquiry*, 17, 1-21.
- Bruner, J. (1996). *The culture of education*. Cambridge, Mass.; London: Harvard University Press.
- Bruner, J. (1997). Labov and Waletzky: Thirty years on. *Journal of Narrative and Life History*, 7, 61-68.
- Bruner, J. (2001). Self-making world-making. In J. Brockmeier & D. A. Carbaugh (Eds.), *Narrative and identity: studies in autobiography, self, and culture* (pp.25-37). Studies in narrative, v. 1. Amsterdam: John Benjamins.
- Bryman, A. (2004). *Social research methods*. 2nd ed. Oxford: Oxford University Press.
- Bucholtz, M., & Hall, K. (2005). Identity and interaction: a sociocultural linguistic approach. *Discourse Studies*, 7, 4-5, 585-614.

- Burke, K. (1969). *A grammar of motives*. Berkeley: University of California Press.
- Bernstein, B. B. (1996). *Pedagogy, symbolic control, and identity: theory, research, critique*. [Critical perspectives on literacy and education]. London: Taylor & Francis.
- Butt, R. L., & Raymond, D. (1989). Studying the nature and development of teachers' knowledge using collaborative autobiography. *International Journal of Educational Research*, 13, 4, 403-419.
- Butt, R. L., Raymond, D., McCue, G., & Yamagishi, L. (1992). Collaborative autobiography and the teacher's voice. In I. F. Goodson (Ed.), *Studying teachers' lives* (pp. 51-98). New York: Teachers College Press.
- Butt, R. L., Townsend, D., & Raymond, D. (1990). Brining Reform to Life: teachers' stories and professional development. *Cambridge Journal of Education*, 20, 3, 255-268.
- Calderhead, J. (1996). Teachers: beliefs and knowledge. In D. C. Berliner & R. C. Calfee (Eds.), *Handbook of educational psychology* (pp.709-725). New York: Macmillan Library Reference USA, Simon & Schuster Macmillan.
- Canadian Journal of Environmental Education (2002). *What stories shall we tell? Panel discussion*: Bob Jickling, Edmund O'sullivan, Ann Jarret, & David Abram. Special issue, 7, 2, 282-293.
- Capra, F. (1996). *The web of life: a new scientific understanding of living systems*. New York: Anchor Books.
- Carr, D. (1986). *Time, Narrative, and History*. Bloomington & Indianapolis: Indiana University Press.
- Carter, K. (1993). The place of story in the study of teaching and teacher education. *Educational Researcher*, 22, 1, 5-12.
- Carter, K. (1994). Preservice teachers' well-remembered events and the acquisition of event-structured knowledge. *Journal of Curriculum Studies*, 26, 3, 235-252.
- Carter, K. & Doyle, W. (1996). Personal narrative and life history in learning to teach. In J. Sikula, T. J. Buttery & E. Guyton (Eds.), *Handbook of research on teacher education* (pp.120-142). New York; London: Macmillan.
- Casey, K. (1993). *I answer with my life: Life histories of women teachers working for social change*. New York: Routledge.
- Casey, K. (1995). The new narrative research in education. *Review of Research in Education*, 21, 211-253.
- Chase, S. E. (1995). *Ambiguous empowerment: the work narratives of women school superintendents*. Amherst: University of Massachusetts Press.
- Chase, S. E. (2005). Narrative inquiry: multiple lenses, approaches, voices. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage Handbook of qualitative research*. 3rd edn. (pp.651-679). Thousand Oaks, Calif.; London: Sage.
- Chatman, S. (1981). What novels can do that films can't (and vice versa). In W. J. T. Mitchell (Ed.), *On narrative* (pp. 117-136). Chicago: University of Chicago Press.
- Chatzifotiou, A. (2002) An imperfect match? The structure of the National Curriculum and education for sustainable development. *The Curriculum Journal*, 13, 3, 289-301.
- Chegar, C., & Kitzinger, J. (2007). Science, patriotism and discourses of nation and culture: reflections on the South Korean stem cell breakthroughs and scandals. *New Genetics and Society*, 26, 3, 289-307.
- Cherryholmes, C. H. (1988). *Power and criticism: poststructural investigations in education*. Advances in contemporary educational thought series, v. 2. New York: Teachers College Press.
- Cho, Y. (2001). Understandings of classroom teaching in secondary schools in Korea. Seoul: Kyo-yuk Kwa-hwk Sa. (In Korean)
- Cho, J. (2002). *Gaps between teachers' beliefs and actual programs of environmental education*. Unpublished Master's thesis, Seoul: Seoul National University.
- Cho, M. (2004). Emergence and evolution of environmental discourses in South Korea. *Korea Journal*, 44, 2, 138-164.

- Choi, S., Shin, H., Lee, J., & Lee, S. (2002). *Project study on the development of 'Environmental Education Promotion Act'*. Proceedings of the Korean Society for Environmental Education Conference. KOSEE. (In Korean)
- Choi, D. (2006). *Suggestions for mainstreaming environmental education in schools*. Paper presented at the seminar for discussions on environmental education policy for mainstreaming and cases studies on networks, October, 24, Cheju, Korea. (In Korean)
- Clandinin, J. (1985). Personal practical knowledge: a study of a teacher's classroom images. *Curriculum Inquiry*, 15, 361-385.
- Clandinin, D. J., Davies, A., Hogan, P., & Kennard, B. (Eds.) (1993). *Learning to teacher, teaching to learn: stories of collaboration in teacher education*. New York: Teachers College, Columbia University.
- Clandinin, D. J., & Connelly, F. M. (1995). *Teachers' professional knowledge landscapes*. Advances in contemporary educational thought series, v. 15. New York: Teachers College Press.
- Clandinin, D. J., & Connelly, F. M. (1998). Stories to live by: narrative understandings of school reform. *Curriculum Inquiry*, 28, 2, 149-164.
- Clandinin, D. J., & Connelly, F. M. (2000). *Narrative inquiry: experience and story in qualitative research*. San Francisco: Jossey-Bass.
- Clandinin, D. J., & Rosiek, J. (2007). Mapping a landscape of narrative inquiry. In D. J. Clandinin (Ed.), *Handbook of narrative inquiry: mapping a methodology* (pp.35-75). Thousand Oaks, Calif.; London: SAGE.
- Clarke, D. & Hollingsworth, S. (2002). Elaborating a model of teacher professional development. *Teaching and Teacher Education*, 18, 8, 947-967.
- Clayton, S., & Opatow, S. (Eds.) (2003). *Identity and the natural environment: the psychological significance of nature*. Cambridge, Massachusetts; London: The MIT Press.
- (CMEJ) Citizens' Movement for Environmental Justice (2003). *A research for the expansion of environmental education in school*. Seoul: Ministry of Environment. (In Korean)
- Cochran-Smith, M. & Lytle, S. L. (1999). Relationships of knowledge and practice: teacher learning in communities. *Review of Research in Education*, 24, 249-305.
- Coffey, A. (1999). *The ethnographic self: fieldwork and the representation of identity*. London: SAGE Publications.
- Coffey, A. (2001). *Education and social change*. Buckingham: Open University Press.
- Collins, S., Osborne, J., Ratcliffe, M., Millar, R., & Duschl, R. (2001). *What 'ideas-about-science' should be taught in school science? A Delphi study of the 'expert' community*. Paper presented at the Annual Conference of the National Association for Research in Science Teaching, March 26-29, St Louis.
- Connelly, F. M., & Clandinin, D. J. (1988). *Teachers as curriculum planners: narratives of experience*. Research in education series, 15. Toronto: OISE Press.
- Connelly, F. M., & Clandinin, D. J. (1990). Stories of experience and narrative inquiry. *Educational Researcher*, 19, 5, 2-14.
- Corney, G., & Reid, A. (2007). Student teachers' learning about subject matter and pedagogy in education for sustainable development. *Environmental Education Research*, 13, 1, 33-54.
- Cotton, D. R. E. (2006). Implementing curriculum guidance on environmental education: the importance of teachers' beliefs. *Journal of Curriculum Studies*, 38, 1, 67-83.
- Court, M. (2004). Using narrative and discourse analysis in researching co-principalships. *International Journal of Qualitative Studies in Education*, 17, 5, 579-603.
- Craig, C. J. (1995). Knowledge communities: a way of making sense of how beginning teachers come to know. *Curriculum Inquiry*, 25, 2, 151-175.
- Craig, C. J. (2001). The relationships between and among teachers' narrative knowledge, communities of knowing, and school reform: a case of "The Monkey's Paw". *Curriculum Inquiry*, 31, 3, 303-331.

- Cronon, W. (1992). A place for stories: nature, history, and narrative. *The Journal of American History*, 78, 4, 1347-1376.
- Cross, R. (1998). Teachers' views about what to do about sustainable development. *Environmental Education Research*, 4, 1, 41-52.
- Culler, J. (1992). On the limits of interpretation. In U. Eco (Ed.), *Interpretation and overinterpretation* (pp.112-128). Cambridge, UK: Cambridge University Press.
- Culler, J. (1997). *Literary theory: a very short introduction*. Oxford: Oxford University Press.
- Czarniawska, B. (1997). *Narrating the organization: dramas of institutional identity*. Chicago: University of Chicago Press.
- Davies, B., & Harré, R. (1990). Positioning: the discursive production of selves. *Journal for the Theory of Social Behaviour*, 20, 1, 43-63.
- Davies, I. (2004). Science and citizenship education. *International Journal of Science Education*, 26, 14, 1751-1763.
- Day, C. (1999). *Developing teachers the challenges of lifelong learning*. Educational change and development series. London: Falmer Press.
- Day, C., Kingston, A., Stobart, G., & Sammons, P. (2006). The personal and professional selves of teachers: stable and unstable identities. *British Educational Research Journal*, 32, 4, 601-616.
- Day, C., Sammons, P., Stobart, G., Kington, A., & Gu, Q. (2007). *Teachers matter: connecting lives, work and effectiveness*. Maidenhead: McGrawHill, OUP.
- DeBoer, G. E. (2000). Scientific literacy: another look at its historical and contemporary meanings and its relationship to science education reform. *Journal of Research in Science Teaching*, 37, 6, 582-601.
- De Fina, A. (2003). *Identity in narrative a study of immigrant discourse*. Studies in narrative, v. 3. Amsterdam: John Benjamins Pub.
- Denzin, N. K. (1989). *Interpretive biography*. Qualitative research methods, v. 17. Newbury Park: Sage.
- DfEE/QCA (1999). *The National Curriculum*. London: DfEE/QCA.
- Diduck, A. (1999). Critical education in resource and environmental management: Learning and empowerment for a sustainable future. *Journal of Environmental Management*, 57, 85-97.
- Dillon, P. J., & Gayford, C. (1997). A psychometric approach to investigating the environmental beliefs, intentions and behaviours of pre-service teachers. *Environmental Education Research*, 3, 3, 283-297.
- Dillon, J., Kelsey, E., & Duque-Aristizábal, A. M. (1999). Identity and culture: theorising emergent environmentalism. *Environmental Education Research*, 5, 4, 395-405.
- Dillon, J., & Scott, W. (2002). Editorial: perspectives on environmental education-related research in science education. *International Journal of Science Education*, 24, 11, 1111-1117.
- Dollard, J. (1935/1949). *Criteria for the life history, with analysis of six notable documents*. New York: Peter Smith.
- Doyle, W. (1997). Heard any really good stories lately? A critique of the critics of narrative in educational research. *Teaching and Teacher Education*, 13, 1, 93-99.
- Driver, R., Newton, P., & Osborne, J. (2000). Establishing the norms of scientific argumentation in classrooms. *Science Education*, 84, 3, 287-312.
- Dryzek, J. S., & Schlosberg, D. (1998). *Debating the earth: the environmental politics reader*. Oxford [England]: Oxford University Press.
- Dunne, J. (1996). Beyond sovereignty and deconstruction: the storied self. In R. Kearney (Ed.), *Paul Ricoeur: the hermeneutics of action* (pp.137-158). London: Sage.
- Duschl, R. A., & Osborne, J. (2002). Supporting and promoting argumentation discourse in science education. *Studies in Science Education*, 38, 39-72.
- Educational Philosophy and Theory (2006). *Special issue: philosophy of science education*. Vol. 38 (5).

- Edwards, (1997). *Discourse and cognition*. London: Sage.
- Elbaz, F. (1983). *Teacher thinking: a study of practical knowledge*. New York: Croom Helm.
- Elbaz, F. (1988). *Knowledge and discourse: the evolution of research on teacher thinking*. Paper presented at the Conference of the International Study Association on Teacher Thinking meeting of the University of Nottingham, England.
- Elbaz, F. (1990). Knowledge and discourse: the evolution of research on teacher thinking. In Day, C., Pope, M. & Denicolo, P. (Eds.), *Insights into teachers' thinking and action*. London: Falmer Press.
- Elbaz, F. (1991). Research on teacher's knowledge: the evolution of a discourse. *Journal of Curriculum Studies*, 23, 1, 1-19.
- Elbaz-Luwisch, F. (2007). Studying teachers' lives and experience: narrative inquiry into K-12 teaching. In D. J. Clandinin (Ed.), *Handbook of narrative inquiry: mapping a methodology* (pp.357-382). Thousand Oaks, Calif.; London: SAGE.
- Environmental Education Research (1998). *Special issue: Significant Life Experience research*. Vol. 4 (4).
- Environmental Education Research (1999). Special issue: five comments on Significant Life Experience research in environmental education. Vol. 5 (4).
- Environmental Education Research (2000). *Special issue: qualitative methods of inquiry*. Vol. 6 (1).
- Environmental Education Research (2002). Special issue: on the possibility of Education for Sustainable Development. Vol. 8 (1).
- Environmental Education Research (2005). Special issue: Transitions in thought and practice: links, divergences and contradictions in post-critical inquiry. Vol. 11 (4).
- Environmental Education Research (2006). Special issue: researching education and the environment: retrospect and prospect. Vol. 12 (3-4).
- Environmental Education Research (2007). Special issue: revisiting schooling and environmental education: contradictions in purpose and practice. Vol. 13 (2).
- Eom, E., Lee, S. & Kang, Y. (2004). The spreading strategy of environmental education based on the status of selecting rate of Environment subject in secondary school. *Environmental Education*, 17, 1, 133-143. (In Korean)
- Estola, E., Erkkilä, R., & Syrjälä, L. (2003). A moral voice of vocation in teachers' narratives. *Teachers and Teaching: Theory and Practice*, 9, 3, 239-256.
- Fairclough, N. (1992). Discourse and text: linguistic and intertextual analysis within discourse analysis. *Discourse & Society*, 3, 2, 193-217.
- Fang, Z. (1996). A review of research on teacher beliefs and practices. *Educational Research*, 38, 1, 47-65.
- Fendler, L., & Tuckey, S. F. (2006). Whose literacy? Discursive constructions of life and objectivity. *Educational Philosophy and Theory*, 38, 5, 589-606.
- Fensham, P. (1997) Science for all? School science and its problems with scientific literacy. In R. Levinson & J. Thomas (Eds.), *Science Today*. New York: Routledge.
- Fien, J. (1999). Towards a map of commitment: a socially critical approach to geographical education. *International Research in Geographical and Environmental Education*, 8, 2, 140-158.
- Fien, J., & Gough, A. (1996). Environmental education. In R. Gilbert (Ed.), *Studying society and the environment: a handbook for teachers* (pp.200-216). Melbourne: Macmillan Education Australia.
- Fien, J., & Maclean, R. (2000). Teacher education for sustainability: two teacher education projects from Asia and the Pacific. In K. A. Wheeler & A. P. Bijur (Eds.), *Education for a sustainable future: a paradigm of hope for the 21st century*. New York: Kluwer Academic/Plenum Publishers.
- Fien, J., & Tilbury, D. (1996). *Learning for a sustainable environment: an agenda for teacher education in Asia and the Pacific*. Bangkok: Asia-Pacific Programme of Educational Innovation for Development, Unesco Principal Regional Office for Asia and the Pacific.

- Fine, M., Weis, L., Weseen, S., & Wong, L. (2000). For whom? Qualitative research, representations, and social responsibilities. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research*. 2nd edn. (pp.107-132). Thousand Oaks, CA: Sage Publications.
- Firth, R., & Winter, C. (2007). Constructing education for sustainable development: the secondary school geography curriculum and initial teacher training. *Environmental Education Research*, 13, 5, 599-619.
- Fraser, E. D. G., Dougill, A. J., Mabee, W. E., Reed, M., & McAlpine, P. (2006). Bottom up and top down: Analysis of participatory processes for sustainability indicator identification as a pathway to community empowerment and sustainable environmental management. *Journal of Environmental Management*, 78, 114-127.
- Fuller, S. (2006). *The philosophy of science and technology studies*. New York: Routledge.
- Gallie, W. B. (1964). *Philosophy and the Historical Understanding*. London: Chatto and Windus.
- Gayford, C. (2004). A model for planning and evaluation of aspects of education for sustainability for students training to teach science in primary schools. *Environmental Education Research*, 10, 2, 255-271.
- Geertz, C. (1973). *The interpretation of cultures; selected essays*. New York: Basic Books.
- Gergen, K., & Gergen, M. (1988). Narrative and the self as relationship. In L. Berkowitz (Ed.), *Advances in Experimental and Social Psychology* (Vol. 21, pp.17-56). New York: Academic Press.
- Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P., & Trow, M. (1994). *The new production of knowledge: the dynamics of science and research in contemporary societies*. London: Sage.
- Giddens, A. (1991). *Modernity and self-identity self and society in the late modern age*. Stanford, Calif: Stanford University Press.
- Glenn, J. L. (2000). *Environment-based education: creating high performance schools and students*. Washington DC: The National Environmental Education & Training Foundation. Available at http://www.pecworks.org/PEEC/PEEC_Research/S001877D2-00187940 (accessed 6 November, 2007).
- González-Gaudiano, E. (2007). Schooling and environment in Latin America in the third millennium. *Environmental Education Research*, 13, 2, 155-169.
- Goodson, I. F. (Ed.) (1992). *Studying teachers' lives*. London: Routledge.
- Goodson, I. F. (1995). The story so far: personal knowledge and the political. In J. A. Hatch & Wisniewski, R. (Eds.), *Life history and narrative*. Qualitative studies series, 1. (pp.89-98) London: Falmer Press.
- Goodson, I. F. (1997). Representing teachers. *Teaching and Teacher Education*, 13, 1, 111-117.
- Goodson, I. F. (1998). Storying the self: life politics and the study of the teacher's life and work. In W. Pinar (Ed.), *Curriculum: toward new identities* (pp. 3-20). New York: Garland Publ.
- Goodson, I. F. (2001). Social histories of educational change. *Journal of Educational Change*, 2, 45-63.
- Goodson, I. F., & Hargreaves, A. (2007). In C. Day, P. Sammons, G. Stobart, A. Kington & Q. Gu (Eds.), *Teachers matter: connecting lives, work and effectiveness* (pp.xi-xv). Maidenhead: McGrawHill, OUP.
- Gough, A., & Whitehouse, H. (2003). The "Nature" of environmental education research from a feminist poststructuralist viewpoint. *Canadian Journal of Environmental Education Research*, 8, 1, 31-43.
- Gough, N. (1999a). Rethinking the Subject: (de)constructing human agency in environmental education research. *Environmental Education Research*, 5, 1, 35-48.
- Gough, N. (1999b). Surpassing our own histories: autobiographical methods for environmental education research. *Environmental Education Research*, 5, 4, 407-418.
- Gough, N. (2002). Thinking/acting locally/globally: Western science and environmental education in a global knowledge economy. *International Journal of Science Education*, 24, 11, 1217-1237.

- Gough, S (2006). Locating the environmental in environmental education research: what research - and why? *Environmental Education Research*, 12, 3, 335-343.
- Gould, S. J. (1996). Full house: the spread of excellence from Plato to Darwin. New York: Harmony Books.
- Grace, M. M., & Ratcliffe, M. (2002). The science and values that young people draw upon to make decisions about biological conservation issues. *International Journal of Science Education*, 24, 11, 1157-1169.
- Greenbank, P. (2003). The role of values in educational research: the case of reflexivity. *British Educational Research Journal*, 29, 6, 791-801.
- Grumet, M. (1991). The politics of personal knowledge. In C. Witherell & N. Noddings (Eds.), *Stories lives tell* (pp.67-77). New York: Teachers College Press.
- Gruenewald, D. A., & Manteaw, B. O. (2007). Oil and water still: how No Child Left Behind limits and distorts environmental education in US schools. *Environmental Education Research*, 13, 2, 171-188.
- Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative inquiry* (pp.105-117). Thousand Oaks, Calif.: Sage.
- Gudmundsdottir, S. (1991). Story-maker, story-teller: narrative structures in curriculum. *Journal of Curriculum Studies*, 23, 3, 207-218.
- Gudmundsdottir, S. (1995). The narrative nature of pedagogical content knowledge. In H. McEwan & Egan, K. (Eds.), *Narrative in teaching, learning and research* (pp.24-38). New York: Teachers College.
- Guskey, T. R., & Huberman, A. M. (1995). *Professional development in education: new paradigms and practices*. New York: Teachers College Press.
- Habermas, J. (2003). *The future of human nature*. London: Polity.
- Hall, S. (Ed.) (1997). *Representation: cultural representations and signifying practices*. Culture, media, and identities. London: Sage in association with the Open University.
- Hall, S. (2000). Who needs identity? In P. Du Gay, J. Evans & P. Redman (Eds.), *Identity: a reader* (pp.15-30). London: Sage Publications and the Open University.
- Ham, S. (2002). The introduction and enactment of the 7th National Curriculum. *Korean Educational Review*, Chapter 4, 79-99. (In Korean)
- Hargreaves, A. (1996). Revising voice. *Educational Researcher*, 25, 1, 12-19.
- Harré, R., Brockmeier, J., Mühlhäuser, P. (1999). *Greenspeak: a study of environmental discourse*. Thousand Oaks, Calif: Sage Publications.
- Hart, P. (1996). Problematizing enquiry in environmental education: issues of method in a study of teacher thinking and practice. *Canadian Journal of Environmental Education*, 1, 56-88.
- Hart, P. (2000). Requisite Variety: the problem with generic guidelines for diverse genres of inquiry. *Environmental Education Research*, 6, 1, 37-46.
- Hart, P. (2002a). Environment in the science curriculum: the politics of change in the Pan-Canadian science curriculum development process. *International Journal of Science Education*, 24, 11, 1239-1254.
- Hart, P. (2002b). Narrative, knowing, and emerging methodologies in environmental education research: issues of quality. *Canadian Journal of Environmental Education*, 7, 2, 140-165.
- Hart, P. (2003). *Teachers' thinking in environmental education: consciousness and responsibility*. New York: Peter Lang Publishing.
- Hart, P. (2005). Editorial: transitions in thought and practice: links, divergences and contradictions in post-critical inquiry. *Environmental Education Research*, 11, 4, 391-400.
- Hart, P. (2007). Social learning as action inquiry: exploring education for sustainable societies. In Wals, A. E. J. (Ed.), *Social learning towards a sustainable world: principles, perspectives, and praxis* (pp.313-329). Wageningen: The Netherlands: Wageningen Academic.
- Hart, P. (2008a). What comes before participation? Searching for meaning in teachers' constructions of participatory learning in environmental education. In A. Reid, B. B. Jensen, J. Nikel & V. Simovska

- (Eds.), *Participation and learning: perspectives on education and the environment, health and sustainability* (pp.197-211). New York: Springer.
- Hart, P. (2008b). Elusive participation: methodological challenges in researching teaching and participatory learning in environmental education. In A. Reid, B. B. Jensen, J. Nikel & V. Simovska (Eds.), *Participation and learning: perspectives on education and the environment, health and sustainability* (pp.225-240). New York: Springer.
- Hart, P., & Nolan, K. (1999). A critical analysis of research in environmental education. *Studies in Science Education*, 34, 1-69.
- Hatch, J. A., & Wisniewski, R. (Eds.) (1995). *Life history and narrative*. Qualitative studies series, 1. London: Falmer Press.
- Hesselink, F., van Kempen, P. P., & A. E. J., Walls (Eds.) (2000). *ESDebate: international on-line debate on Education for Sustainable Development*. Geneva: IUCN.
- Hirsch, G. (1993). Biography and teacher identity: a typological analysis of life-history data. *Qualitative studies in Education*, 6, 1, 67-83.
- Holland, D., Lachicotte Jr., W., Skinner, D., & Cain, D. (1998). *Identity and agency in cultural worlds*. Cambridge, MA: Harvard University Press.
- House of Lords Select Committee on Science and Technology (2000). *Science and Society*. Third report. London: House of Lords.
- Hoy, A. W., Davis, H., & Pape, S. J. (2006). Teacher knowledge and beliefs. In P. A. Alexander & P. H. Winne (Eds.), *Handbook of educational psychology*. 2nd Ed. (pp. 715-737). Mahwah, N.J.: Erlbaum.
- Huckle, J., & Sterling, S. (Eds.) (1996). *Education for Sustainability*. London: Earthscan.
- Hug, J. (1977). A report on the North American Regional Seminar on Environmental Education: a confrontation with the issues. Environmental education for the real world. Columbus, OH: CSMEE Information Center.
- Hwang, E., & Lee, J. (2005). A comparative study on awareness of environmentally friendly behaviour and barriers to implementing actions between students and Environment teachers. *The Environmental Education*, 18, 1, 97-109.
- Hwang, S. (2003). *The educational meaning of nature experience*. Unpublished Master's thesis, Seoul: Seoul National University.
- Hwang, S. (2006). *Exploring environmental education in view of epistemologies of science and science communication strategies*. Award-winning environmental essay at the Student Environmental Award. Seoul: Kyobo Foundation for Education & Culture.
- Hyvärinen, M. (2006). Towards a conceptual history of narrative. In M. Hyvärinen, A. Korhonen & J. Mykkänen (Eds.), *The travelling concept of narrative* (pp. 20-41). Studies across Disciplines in the Humanities and Social Sciences, 1. Helsinki: Helsinki Collegium for Advanced Studies.
- Hyvärinen, M., Korhonen, A., & Mykkänen, J. (Eds.) (2002). *The travelling concept of narrative*. Studies across Disciplines in the Humanities and Social Sciences 1. Helsinki: Helsinki Collegium for Advanced Studies.
- Irwin, A. (1995). *Citizen science: a study of people, expertise and sustainable development*. London: New York: Routledge.
- (IUCN) International Union for Conservation of Nature and Natural Resources (1970). *International working meeting on environmental education in the school curriculum*. Final report. IUCN USA: IUCN.
- Jackson, P. W. (1968). *Life in the classroom*. New York: Holt, Rinehart and Winston.
- Jackson, R., Barbagallo, F. & Haste, H. (2005). Strengths of public dialogue on science-related issues. *Critical Review of International Social and Political Philosophy*, 8, 3, 349-358.
- Japp, P. M., & Japp, D. K. (2002). Purification through simplification: nature, the Good Life, and consumer culture. In M. Meister & P. M. Japp (Eds.), *EnviroPOP: studies in environmental rhetoric and popular culture* (pp.81-94). Westport, Conn: Praeger.

- Jenkins, E. W. (1997). Scientific and technological literacy for citizenship: what can we learn from research and other evidence? In S. Sjøberg & E. Kallerud (Eds.), *Science, technology and citizenship. The public understanding of science and technology in science education and research policy* (pp.29-50). Norwegian Institute for Studies in Research and Higher Education, Report no 7.
- Jeung, M. (2004). What should environmental education as a separate subject be? *Environmental Education*, 17, 2, 1-9. (In Korean)
- Jickling, B. & Spork, H. (1998). Education for the Environment: a critique. *Environmental Education Research*, 4, 3, 309-327.
- Jiménez-Alexiandre, M. & Pereiro-Muñoz, C. (2002). Knowledge producers or knowledge consumers? Argumentation and decision making about environmental management. *International Journal of Science Education*, 24, 1171-1190.
- Joo, H. (2005). A biographical study on the formation of environmental identity of an undergraduate student. Unpublished PhD thesis, Seoul: Seoul National University.
- Joyce, B. R., & Showers, B. (1988). *Student achievement through staff development*. White Plains, NY: Longman.
- Kamberelis, G., & Dimitriadis, G. (2005). Focus groups: strategic articulations of pedagogy, politics, and inquiry. In N. K. Denzin (Ed.), *Handbook of Qualitative Research*. 3rd edn. (pp.887-907). Thousand Oaks, CA; London: Sage.
- Kang, Y. (2004). The influence of teacher's responsibility on environmental education class: a case study on "Ecology and Environment" class for high school in Korea. Unpublished Master's thesis, Seoul: Seoul National University.
- Kang, J. (2006). (A) Qualitative case study on the geography teacher's environmental education in a Korean high school classroom. Unpublished PhD thesis, Seoul: Seoul National University.
- Kang, Y., Kim, B., & Han, J. (2006). Silence and fanaticism: seven year long documentary on Hwang Woo-suk scandal. Seoul: Humanitas.
- Kant, I. (1790/1987). *Critique of judgment*. Trans. Werner S. Pluhar. Indianapolis, Ind.: Hackett Pub.
- Kaufman, J. S., Ewing, M. S., Hyle, A. E., Montgomery, D., & Self, P. A. (2001). Women and nature: using memory-work to rethink our relationship to the natural world. *Environmental Education Research*, 7, 4, 359-377.
- (KEDI) Korean Educational Development Institute (1991). Project study on the intensification of school environmental education for the 6th National Curriculum revision. Seoul: KEDI.
- KEDI Journal of Educational Policy (2005). *Special issue: educational fever*. Vol. 2 (1).
- (KEEN) Korean Environmental Education Network (2008). *A forum for legislation of ordinance of Environmental Education Promotion Act*. 28, April. Seoul. (In Korean)
- Kelly, T. E. (1986). Discussing controversial issues: four perspectives on the teacher's role. *Theory and Research in Social Education*, 14, 2, 113-138.
- Khalid, T. (2003). Pre-service high school teachers' perceptions of three environmental phenomena. *Environmental Education Research*, 9, 1, 35-50.
- (KICE) Korea Institute of Curriculum and Evaluation (2001). Improving the quality of Korean School education: strategies of curriculum management and classroom teaching. Seoul: KICE. (In Korean)
- (KICE) Korea Institute of Curriculum and Evaluation (2002). Improving the quality of Korean school education (Ⅱ): a qualitative case study of good science teaching in the secondary school. Seoul: KICE. (In Korean)
- (KICE) Korea Institute of Curriculum and Evaluation (2004). *Findings from Trends in International Mathematics and Science Study for Korea: TIMSS 2003 report in Korea*. Seoul: KICE. (In Korean)
- Killingsworth, M. J., & Palmer, J. S. (1992). *Ecospeak: rhetoric and environmental politics in America*. Carbondale: Southern Illinois University Press.

- Kim, C. (2002). An ethnographic case study on environmental education of discretionary activity in two Korean middle schools. Unpublished Master's thesis, Seoul: Seoul National University.
- Kim, J. (2002). Are Schools Being Collapsed? The reality of 'school collapse' observed in a daily school life. *Korean Journal of Educational Research*, 40, 3, 271-298. (In Korean)
- Kim, I. (2003). *What is the Schoolyard Forest Initiative?* School Forest Model Schools workshop (pp.1-25), Schoolyard Forest Committee. (In Korean)
- Kim, J. (2004). Education reform policies and classroom teaching in South Korea. *International Studies in Sociology of Education*, 14, 2, 125-145.
- Kim, J., Lee, J., & Lee, S. (2005). Understanding educational fever in Korea. *KEDI Journal of Educational Policy*, 2, 1, 7-15.
- Kim, G. (2007). Hwang Woo-suk myth and Korean science: a science documentary. Seoul: Yeok-sa Bi-pyung Sa. (In Korean)
- Kim, N. (2007). Evaluating an environmental education through participants' retrospective narratives after 10 years. Unpublished PhD thesis, Seoul: Seoul National University.
- Kim, S. (2007). A study on collaborative action between school and local NGO in EE: the procedure of building teacher-volunteer partnership. Unpublished PhD thesis, Seoul: Seoul National University.
- Kitchell, A., Hannan, E., & Kempton, W. (2000). Identity through stories: story structure and function in two environmental groups. *Human Organization*, 59, 1, 96-105.
- Kitchell, A., Kepmton, W., Holland, D., & Tesch, D. (2000). Identities and actions within environmental groups. *Human Ecology Review*, 7, 2, 1-20.
- Klassen, S. (2007). The application of historical narrative in science learning: the Atlantic Cable story. *Science & Education*, 16, 335-352.
- Klein, R. D. (1979). How to do what we want to do: thoughts about feminist methodology. In G. Bowles & R. D. Klein (Eds.), *Theories of women's studies* (pp. 88-104). New York: Norton.
- Kolstø, S. D. (2001). Scientific literacy for citizenship: tools for dealing with the science dimension of controversial socioscientific issues. *Science Education*, 85, 291-310.
- Ku, D. (2004). The Korean environmental movement: green politics through social movement. *Korea Journal*, 44, 3, 185-219.
- Kubli, F. (2005). Science teaching as a dialogue: Bakhtin, Vygotsky and some applications in the classroom. *Science & Education*, 14, 6, 501-534.
- Kuhn, T. S. (1962). *The structure of scientific revolutions*. Chicago: University of Chicago Press.
- Kwak, Y., & Kim, J. (2002). Qualitative analysis on the characteristics of instruction methods of exemplary science teachers. *Curriculum and Evaluation Research*, 5, 1, 207-220.
- Kwon, Y., Kim, J., & Min, K. (2002). *Environmental education for sustainable development: definitions and international and national contexts*. Proceedings of the Korean Society for Environmental Education Conference. Special theme: sustainable development and environmental education (pp.26-34). December, 12. (In Korean)
- Kyburz-Graber, R., Hart, P., Posch, P., & Robottom, I. (Eds.) (2006). *Reflective practice in teacher education: learning from case studies of environmental education*. Bern: Peter Lang.
- Labov, W., & Waletzky, J. (1967). Narrative analysis: oral version of personal experience. In J. Helm (Ed.), *Essays on the verbal and visual arts* (pp.12-44). Seattle: University of Washington Press.
- Larson, C. L. (1997). Re-presenting the subject: problems in personal narrative inquiry. *Qualitative Studies in Education*, 10, 4, 455-470.
- Lather, P. (1991). *Getting smart: feminist research and pedagogy with/in the postmodern*. New York: Routledge.
- Lather, P. (1992). Critical frames in educational research: feminist and post-structural perspectives. *Theory Into Practice*, 31, 2, 87-99.

- Lather, P. (1999). *Reading the image of Rigoberta Menchu: undecidability and language lessons*. Paper presented to the Journal of Curriculum Theorizing Conference, October. Bergamo, OH, USA.
- Latour, B. (1987). *Science in action: how to follow scientists and engineers through society*. Cambridge, Mass: Harvard University Press.
- Lederman, N. G. (1992). Students' and teachers' conceptions of the nature of science: a review of the research. *Journal of Research in Science Teaching*, 29, 331-359.
- Lee, H., & Witz, K. (2005). *Teaching as a moral enterprise: an exemplary science teacher's teaching of socioscientific issues*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, April 4-7, Dallas, TX.
- Lee, J. (2004). A survey on Environment teachers' awareness of the teacher role in environmental classes introducing controversial issues. *Environmental Education*, 17, 2, 50-59. (In Korean)
- Lee, S. (2005). Country report: Korea. In F. Mogensen & M. Mayer (Eds.), *ECO-schools – trends and divergences: A comparative study on ECO-school development processes in 13 countries* (pp.277-292). Vienna: Austrian Federal Ministry of Education, Science and Culture.
- Lee, J. (2004). A survey on Environment teachers' awareness of the teacher role in environmental classes introducing controversial issues. *Environmental Education*, 17, 2, 50-59. (In Korean)
- Lee, S., Lee, J., Lee, S., Lee, Y., Min G., Shim S., Kim, N., & Ha, K. (2005). *The National Implementation Strategy for United Nations Decade of Education for Sustainable Development*. Final report. Presidential Committee for Sustainable Development. (In Korean)
- Lee, S. (2006). Personal communication.
- Lee, S. (2006). Reflecting and rethinking environmental education research in Korea. *Environmental Education [Japan]*, 15, 3, 34-40.
- Levionson, R. (2006). The use of narrative in supporting the teaching of socio-scientific issues: a study of teachers' reflections. *INTERACÇÕES*, 4, 24-41.
- Lieberman, G., & Hoody, L. (1998). *Closing the achievement gap: using the environment as an integrated context for learning*. Poway, CA: Science Wizards.
- Lieblich, A., Tuval-Mashiach, R., & Zilber, T. (1998). *Narrative research reading, analysis and interpretation*. Applied social research methods series, v. 47. Thousand Oaks, Calif.: Sage Publications.
- Lejune, P. (1989). *On autobiography*. Minneapolis, MN: University of Minnesota Press.
- Lincoln, Y. S., & Denzin, N. K. (2000). The seventh moment: out of the past. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp.1047-1065). Thousand Oaks, CA: Sage.
- Loughland, T., Reid, A., & Petocz, P. (2002). Young people's conceptions of environment: a phenomenographic analysis. *Environmental Education Research*, 8, 2, 187-197.
- Lucas, A. M. (1979). *Environment and environmental education: conceptual issues and curriculum implications*. Melbourne: Australian International Press and Publications.
- Luehmann, A. L., & Markowitz, D. (2007). Science Teachers' Perceived Benefits of an Out-of-school Enrichment Programme: Identity needs and university affordances. *International Journal of Science Education*, 29, 9, 1133-1161.
- Luke, A. (1995). Text and discourse in education: An introduction to critical discourse analysis. *Review of research in education*, 21, 3-48.
- Luks, F., & Siebenhünerb, B. (2007). Transdisciplinarity for social learning? The contribution of the German socio-ecological research initiative to sustainability governance. *Ecological Economics*, 63, 418-426.
- MacLure, M. (1993). Arguing for your self: identity as an organising principle in teachers' jobs and lives. *British Educational Research Journal*, 19, 4, 311-384.
- Macnaghten, P., & Urry, J. (1998). *Contested Natures*. London: Sage.
- Matthews, M. R. (1998). In Defense of Modest Goals When Teaching about the Nature of Science. *Journal of Research In Science Teaching*, 35, 2, 161-174.

- McAdams, D. P. (1988). *Power, intimacy, and the life story: personological inquiries into identity*. New York & London: The Guilford Press.
- McComas, W. F., & Olson, J. K. (1998). The nature of science in international science education standards documents. In W. F. McComas (Ed.), *The nature of science in science education: rationales and strategies* (pp.41-52). Dordrecht: Kluwer.
- McKenzie, M. (2004). The “willful contradiction” of poststructural socio-ecological education. *Canadian Journal of Environmental Education*, 9, 177-190.
- McKenzie, M. (2005). The “Post-Post Period” and Environmental Education Research. *Environmental Education Research*, 11, 4, 401-412.
- McKeown, R. (2002). *Education for sustainable development toolkit*. Ver. 2. Available online at: <http://www.esdtoolkit.org/default.htm> (accessed May 2008).
- Meister, M., & Japp, P. M. (2002). *EnviroPOP: studies in environmental rhetoric and popular culture*. Westport, Conn: Praeger.
- Michael, M., Grinyer, A., & Turner, J. (1997). Teaching biotechnology: identity in the context of ignorance and knowledgeability. *Public Understanding of Science*, 6, 1-17.
- Middlestadt, S. E., Ledsy, R., & Sanchack, J. (1999). *Elementary school teachers’ beliefs about teaching environmental education*. Rock Spring, GA: North American Association for Environmental Education.
- Midgley, M. (1992). *Science as salvation: a modern myth and its meaning*. London: Routledge.
- Millar, R., & Osborne, J. (1998). *Beyond 2000 science education for the future: a report with ten recommendations*. London: King’s College London, School of Education.
- Miller, R. L. (2000). *Researching life stories and family histories*. London: Sage.
- Mills, J. (2001). Self-construction through conversation and narrative in interviews. *Educational Review*, 53, 3, 285-301.
- Milne, C. (1998). Philosophically correct science stories? Examining the implications of heroic science stories for school science. *Journal of Research in Science Teaching*, 35, 2, 175-187.
- Ministry of Education (1987). *The 5th elementary, middle and high school curriculum*. Seoul: Ministry of Education. (In Korean)
- Ministry of Education (1992). *The 6th elementary, middle and high school curriculum*. Seoul: Ministry of Education. (In Korean)
- Ministry of Education (1997). *The 7th elementary, middle and high school curriculum*. Seoul: Ministry of Education. (In Korean)
- Ministry of Environment (1999). *Case studies for the 7th environment conservation model schools: kindergarten, primary schools, middle schools, and high schools*. Gwacheon: Ministry of Environment. (In Korean)
- Ministry of Environment (2001). *Case studies for the 8th Environment Conservation Model Schools: Kindergarten, Primary schools, Middle schools, and high schools*. Gwacheon: Ministry of Environment. (In Korean)
- Ministry of Environment (2002). *Project study on the development of environmental education strategies for achieving national sustainable development*. Gwacheon: Ministry of Environment. (In Korean)
- Ministry of Environment (2003). *Case studies for the 9th environment conservation model schools: kindergarten, primary schools, middle schools, and high schools*. Gwacheon: Ministry of Environment. (In Korean)
- Ministry of Environment (2006). *Environmental education development plan (2006-2015)*. Gwacheon: Ministry of Environment. (In Korean)
- Mishler, E. G. (1986). *Research interviewing: context and narrative*. Cambridge, Mass: Harvard University Press.

- Mishler, E. G. (1999). *Storylines: craftartists' narratives of identity*. Cambridge, MA: Harvard University Press.
- Monk, M., & Osborne, J. (1997). Placing the history and philosophy of science on the curriculum: a model for the development of pedagogy. *Science Education*, 81, 4, 405-424.
- NAAEE (North American Association for Environmental Education) (1996). *Environmental education materials: guidance for excellence*. Washington D.C.: NAAEE.
- Nam, S. (1995). Environmental education in primary and secondary schools in Korea: current developments and future agendas. *Environmental Education Research*, 1, 1, 109-122.
- Nam, S. (2005). Models of subject change and the phenomenon of the environment subject, *Environmental Education Newsletter*, 34. (In Korean)
- Neumann, A., & Peterson, P. L. (Eds.) (1997). *Learning from our lives: women, research, and autobiography in education*. New York: Teachers College Press.
- Newbury, L. (2003). Will any/body carry that canoe? A geography of the body, ability, and gender. *Canadian Journal of Environmental Education*, 8, 204-216.
- Nias, J. (1989). *Primary teachers talking: a study of teaching as work*. London: Routledge.
- Nikel, J. (2005). Ascribing responsibility: a three country study of student teachers' understanding(s) of education, sustainable development, and ESD. Unpublished PhD thesis, Bath: University of Bath.
- Nikel, J. (2007). Making sense of education 'responsibly': findings from a study of student teachers' understanding(s) of education, sustainable development and Education for Sustainable Development. *Environmental Education Research*, 13, 5, 545-564.
- Nikel, J., Temmy, K., Hwang, S., Pozos-Hernandez, B. A., Reid, A., & Hart, P. (in preparation) Understanding others, understanding ourselves: engaging in constructive dialogue about process in doctoral study in (environmental) education.
- Noh, K, Lee, H., & Park, H. (1998). Trends of environmental education research of Korea. *Environmental Education*, 11, 2, 69-82. (In Korean)
- Norris, S. P., Guilbert, S.M., Smith, M.L., Shahram, H., & Phillips, L.M. (2005). A theoretical framework for narrative explanation in science. *Science Education*, 89, 4, 535-563.
- Nowotny, H., Scott, P., & Gibbons, M. (2001). *Re-Thinking Science: Knowledge and the Public in an Age of Uncertainty*. Polity Press: Cambridge.
- O'Donoghue, R. (2006). Locating the environmental in environmental education research: a review of research on nature's nature, its inscription in language and recent memory work on relating to the natural world. *Environmental Education Research*, 12, 3, 345 – 357.
- O'Donoghue, R., & Lotz-Sisitka, H. (2005). Towards a better grasp of what matters in view of "the Posts". *Environmental Education Research*, 11, 4, 445-454.
- Oh, W. (2002). Educational fever in Korean society: origins and intensification. Seoul: Kyo-yuk Kwa-hak Sa. (In Korean)
- Olson, J. (1992). *Understanding teaching: beyond expertise*. Buckingham: Open University Press.
- Olson, M. (2000). Curriculum as a multistoried process. *Canadian Journal of Education*, 25, 3, 169-187.
- Osborne, J. (2002). Science without literacy: a ship without a sail? *Cambridge Journal of Education*, 32, 2, 203-218.
- Osborne, J., Duschl, R. A., & Fairbrother, R. W. (2002). *Breaking the mould? Teaching science for public understanding*. London: Nuffield Foundation.
- Oulton C. R., & Scott W. A. H. (1994). Improving Teachers' Contribution to Environmental Education. *Journal of Teacher Development*, 3, 1, 23-29.
- Oulton, C. R., & Scott, W. A. H. (1995). The 'Environmentally Educated Teachers': an exploration of the implications of UNESCO-UNEP's ideas for pre-service teacher education programmes. *Environmental Education Research*, 1, 2, 213-231.

- Oulton, C., Dillon, J., & Grace, M. M. (2004). Reconceptualizing the teaching of controversial issues. *International Journal of Science Education*, 26, 4, 411-423.
- Oulton, C., Day, V., Dillon, J., & Grace, M. M. (2004). Controversial issues - teachers' attitudes and practices in the context of citizenship education. *Oxford Review of Education*, 30, 4, 489-507.
- Ozawa, C. (1996). Science in environmental conflict. *Sociological Perspectives*, 39, 2, 219-230.
- Palmer, J.A. (1995). Environmental thinking in the early years: understanding and misunderstanding of concepts related to waste management. *Environmental Education Research*, 1, 2, 35-45.
- Palmer, J. A., Suggate, J., Bajd, B., & Tsaliak, E. (1998). Significant influences on the development of adults' environmental awareness in the UK, Slovenia and Greece. *Environmental Education Research*, 4, 4, 429-444.
- Payne, P. (1997). Embodiment and environmental education. *Environmental Education Research*, 3, 2, 133-153.
- Payne, P. (1999a). Postmodern challenges and modern horizons: education 'for being for the environment'. *Environmental Education Research*, 5, 1, 5-34.
- Payne, P. (1999b). The significance of experience in SLE research. *Environmental Education Research*, 5, 4, 365-381.
- Payne, P. (2000). Identity and environmental education. *Environmental Education Research*, 7, 1, 67-88.
- Payne, P. (2003). Postphenomenological enquiry and living the environmental condition. *Canadian Journal of Environmental Education*, 8, 169-190.
- Payne, P. (2005). Lifeworld and textualism: reassembling the researcher/ed and 'others'. *Environmental Education Research*, 11, 4, 413-431.
- Phillips, L., & Jørgensen, M. (2002). *Discourse analysis as theory and method*. London: Sage Publications.
- Plec, E. (2007). Crisis, coherence, and the promise of critical rhetoric. *Environmental Communication: A Journal of Nature and Culture*, 1, 1, 49-57.
- Plummer, K. (1995). Telling sexual stories: Power, change and social worlds. London: Routledge.
- Polkinghorne, D. E. (1988). *Narrative Knowing and the Human Sciences*. Albany NY: State University of New York Press.
- Polkinghorne, D. E. (1995). Narrative configuration in qualitative analysis. In J. A. Hatch & R. Wisniewski (Eds.), *Life history and narrative* (pp.5-24). Qualitative studies series, 1. London: Falmer Press.
- Popkewitz, T. S., & Brennan, M. (1998). *Foucault's challenge discourse, knowledge, and power in education*. New York: Teachers College Press.
- Popular Memory Group. (1982). Popular memory: theory, politics, methods. In R. Johnson, G. McLenna, B. Schwartz, & D. Sutton (Eds.), *Making histories* (pp.205-252). London: Hutchison.
- Power, C. (Ed.) (1994). The Project 2000+ declaration: the way forward. Paris: UNESCO.
- (QCA) Qualifications and Curriculum Authority (1998). *Education for citizenship and the teaching of democracy in schools*. Final report of the Advisory Group on Citizenship, 22 September, QCA/98/245.
- Reed, M. S., Fraser, E. D. G., & Dougill, A. J. (2005). An adaptive learning process for developing and applying sustainability indicators with local communities. *Ecological Economics*, 59, 4, 406-418.
- Reid, A. (2003). Sensing environmental education research. *Canadian Journal of Environmental Education*, 8, 9-30.
- Reid, A. (2004). Life's rich tapestry. In Scott, W. & Gough, S. (Eds.), *Key issues in sustainable development and learning: a critical review* (pp.161-163). London: RoutledgeFalmer.
- Reid, A., Nikel, J., & Scott, W. (2006). *Indicators for Education for Sustainable Development: a report on perspectives, challenges and progress*. December 2006. Anglo-German Foundation for the Study of Industrial Society.

- Reid, A., & Scott, W. (2006). Researching education and the environment: retrospect and prospect. *Environmental Education Research*, 12, 3-4, 571-587.
- Reid, A., & Nikel, J. (2007). 'Telling tales' of sustainable development in education. In I. Björneloo & E. Nyberg (Eds.), *Drivers and barriers for implementing Learning for Sustainable Development in pre-school through upper secondary and teacher education* (pp.85-90). Göteborg Workshop, 27-29 March 2006, UNESCO, Education for Sustainable Development in Action Technical Paper N°4, 85-90.
- Richardson, L., & St. Pierre, E. A. (2005). Writing: a method of inquiry. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research*. 3rd ed. pp.959-978. Thousand Oaks, CA: Sage.
- Ricœur, P. (1983/1984). *Time and narrative*. Vol. 1. Trans. Kathleen Blamey and David Pessauer. Chicago: The University of Chicago Press.
- Ricœur, P. (1985/1988). *Time and narrative*. Vol. 3. Trans. Kathleen Blamey and David Pessauer. Chicago: The University of Chicago Press.
- Ricœur, P. (1991). Life in quest of narrative. In D. Wood (Ed.), *On Paul Ricœur: narrative and interpretation* (pp.20-33). London: Routledge.
- Ricœur, P. (1992). *Oneself as another*. Chicago: University of Chicago Press.
- Riessman, C. K. (1993). *Narrative analysis*. Qualitative research methods, v. 30. Newbury Park, CA: Sage Publications.
- Riessman, C. K. (2003). Analysis of personal narratives. In J. F. Gubrium & J. A. Holstein (Eds.), *Postmodern interviewing* (pp. 331-347). London: Sage.
- Riessman, C. K. (2004). Narrative analysis. In M. S. Lewis-Beck, A. Bryman & T. F. Liao (Eds.), *The Sage Encyclopedia of social science research methods* (pp.705-710). Thousand Oaks, Calif.: Sage.
- Rimmon-Kenan, S. (2006). Concepts of narrative. In M. Hyvärinen, A. Korhonen & J. Mykkänen (Eds.), *The travelling concept of narrative* (pp. 10–19). Studies across Disciplines in the Humanities and Social Sciences 1. Helsinki: Helsinki Collegium for Advanced Studies.
- Rist, S., Chiddambaranathan, M., Escobar, C., Wiesmann, U., & Zimmermann, A. (2007). Moving from sustainable management to sustainable governance of natural resources: the role of social learning processes in rural India, Bolivia and Mali. *Journal of Rural Studies*, 23, 1, 23-37.
- Roberts, B. (1999). Some thoughts on time perspectives and auto/biography. *Auto/Biography*, VII, 1/2, 21-25.
- Roberts, B. (2002). *Biographical Research*. Buckingham, Philadelphia: Open University Press.
- Robinson, V. M. J., & Walker, J.C. (1999). Theoretical privilege and researchers' contribution to educational change. In J. S. Gaffney & B. J. Askew (Eds.), *Stirring the waters: The influence of Marie Clay* (pp. 239-259). Portsmouth, NH: Heinemann.
- Robottom, I., & Hart, P. (1993). *Research in environmental education: engaging the debate*. Geelong: Deakin University Press.
- Robottom, I., & Kyburz-Graber, R. (2000). Recent international developments in professional development in environmental education: reflections and issues. *Canadian Journal of Environmental Education*, 5, 249-267.
- Rosenwald, G. C., & Ochberg, R. L. (1992). Introduction: life stories, cultural politics, and self-understandings. In G. C. Rosenwald & R. L. Ochberg (Eds.), *Storied lives: the cultural politics of self-understanding* (pp.1-18). New Haven; London: Yale University Press.
- Roth, R. E. (1997). A critique of "Alternatives to national standards for environmental education: process-based quality assessment". *Canadian Journal of Environmental Education*, 2, 1, 28-34.
- Ryder, J. (2001). Identifying science understanding for functional scientific literacy. *Studies in Science Education*, 36, 1-44.
- Ryder, J. (2002). School science education for citizenship: strategies for teaching about the epistemology of science. *Journal of Curriculum Studies*, 34, 6, 637-658.

- Sachs, J. (2001). Teacher professional identity: competing discourses, competing outcomes. *Journal of Education Policy*, 16, 2, 149-161.
- Sachs, J. (2002). *The activist teaching profession*. Buckingham: Open University Press.
- Sadler, T., Chambers, F. W., & Zeidler, D. L. (2004). Student conceptualizations of the nature of science in response to a socioscientific issue. *International Journal of Science Education*, 26, 4, 387-409.
- Sapiro, M. (1989). Textualizing global politics. In J. Der Derian & M. J. Shapiro (Eds.), *International /intertextual relations: postmodern readings of world politics* (pp.11-22). Lexington, Mass: Lexington Books.
- Sarangi, S. (2003). Institutional, professional, and lifeworld frames in interview talk. In H. van den Berg, M. Wetherell, & H. Houtkoop-Steenstra (Eds.), *Analyzing race talk*. Cambridge: Cambridge University Press.
- Schegloff, E. A. (1992). In another context. In A. Duranti & C. Goodwin (Eds.), *Rethinking context* (pp.191-227). Cambridge, Cambridge University Press.
- Schön, D. A. (1991). *The Reflective turn: case studies in and on educational practice*. New York: Teachers College Press.
- Schumacher, E. F. (1973). *Small is beautiful: a study of economics as if people mattered*. London: Blond and Briggs.
- Schwandt, T. J. (2000). Three epistemological stances for qualitative inquiry: interpretation, hermeneutics, and social construction. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research*. 2nd ed. (pp.189-213). Thousand Oaks, CA: Sage.
- Scott, S. (2003). Innovative use of teaching repertoire: a study in transfer of complex strategies into classroom practice by novice teachers. *European Journal of Teacher Education*, 26, 3, 365 – 377.
- Scott, W.A.H. (1994). Diversity and opportunity – reflections on environmental education within initial teacher education programmes across the European Union. In F. G. Brinkman & W. A. H. Scott (Eds.), *Environmental education into initial teacher education in Europe (EEITE) 'The State of the Art'*. ATEE Cahiers no.8. Brussels: Association of Teacher Education in Europe.
- Scott, W. A. H. (1996a). Pre-service Environmental Teacher Education: a critique of recent arguments about constraints, approaches and course design. *Environmental Education and Information*, 15, 3, 307-318.
- Scott, W. A. H. (1996b). The Environmentally-educating Teacher: a synthesis of an implementation theory for pre-service courses. *Australian Journal of Environmental Education*, 12, 53-60.
- Scott, W., & Oulton, C. (1999). Environmental Education: arguing the case for multiple approaches. *Educational Studies*, 25, 1, 89-97.
- Scott, W., & Gough, S. (2003). *Sustainable development and learning: framing the issues*. London: RoutledgeFalmer.
- Seth, M. J. (2002). *Education fever: society, politics, and the pursuit of schooling in South Korea*. Honolulu: University of Hawaii Press.
- Sfard, A., & Prusak, A. (2005). Telling identities: In search of an analytic tool for investigating learning as a culturally shaped activity. *Educational Researcher*, 34, 4, 14 – 22.
- Smith, D. (1988). *Corporate power, risk assessment and the control of major hazards: a study of Canvey Island and Ellesmere Port*. Unpublished Ph.D. thesis, Manchester: University of Manchester.
- Smith, R. G. (1999). Piecing it together: student teachers building their repertoires in primary science. *Teaching and Teacher Education*, 15, 301-314.
- Snow, D. A. & Anderson, L. (1987). Identity work among the homeless: the verbal construction and avowal of personal identities. *The American Journal of Sociology*, 92, 6, 1336-1371.
- Solomon, J. (2002). Science stories and science texts: what can they do for our students? *Studies in Science Education*, 37, 85-106.

- Solomon, J., & Thomas, J. (1999). Science Education for the Public Understanding of Science. *Studies in Science Education*, 33, 61-90.
- Soper, K. (1995). What is nature? Culture, politics and the non-human. Oxford: Blackwell.
- Søndergaard, D. M. (2002). Poststructuralist approaches to empirical analysis. *International Journal of Qualitative Studies in Education*, 15, 2, 187 – 204.
- Stables, A. (1996). Studying education as text: parameters and implications. *International Journal of Research & Method in Education*, 19, 1, 5 -13.
- Stables, A. W. G. (1998). Environmental literacy: functional, cultural, critical. The case of the SCAA guidelines. *Environmental Education Research*, 4, 2, 155-164.
- Stables, A. (2001). Who drew the sky? Conflicting assumptions in environmental education. *Educational Philosophy and Theory*, 33, 2, 245-256.
- Stables, A. (2005). Living and learning as semiotic engagement a new theory of education. Lewiston: Edwin Mellen Press.
- Stanley, L. (1992). The auto/biographical I: the theory and practice of feminist auto/biography. Manchester: Manchester University Press.
- Stenberg, S. (2005). *Professing and pedagogy: learning the teaching of English*. Urbana, Ill: National Council of Teachers of English.
- Stevenson, R. (1987). Schooling and environmental education: contradictions in purpose and practice. In I. Robottom (Ed.), *Environmental education: practice and possibility* (pp.69-82). Geelong: Deakin University Press.
- Stevenson, R. (2007a). Editorial. *Environmental Education Research*, 13, 2, 129-138.
- Stevenson, R. (2007b). Schooling and environmental/sustainability education: from discourses of policy and practice to discourses of professional learning. *Environmental Education Research*, 13, 2, 265-286.
- St. Pierre, E. A. (2000). Poststructural feminism in education: an overview. *International Journal of Qualitative Studies in Education*, 13, 5, 477 – 515.
- Summers, M., Kruger, C., Childs, A., & Mant, J. (2000). Primary school teachers' understanding of environmental issues: an interview study. *Environmental Education Research*, 6, 4, 293-312.
- Summers, M., Kruger, C., Mant, J., & Childs, A. (2000). Understanding the science of environmental issues: a research-based guide for primary and non-specialist secondary teacher education. Hatfield: Association for Science Education.
- Summers, M., Corney, G. & Childs, A. (2003). Teaching sustainable development in primary schools: an empirical study of issues for teachers. *Environmental Education Research*, 9, 3, 327-346.
- Suwa, T. (2005). Spreading processes and features of school environmental education in Korea, the People's Republic of China, and Japan. *Environmental Education*, 18, 2, 113-215. (In Korean)
- Sykes, H. (2001). Understanding and overstanding: feminist-poststructural life histories of physical education teachers. *International Journal of Qualitative Studies in Education*, 14, 1, 13-31.
- Taylor, S. (2001). Locating and conducting discourse analytic research. In S. Yates, S. Taylor & M. Wetherell (Eds.), *Discourse as data: a guide for analysis* (pp.5-48). London: SAGE.
- Teichert, D. (2004). Narrative, identity and the self. *Journal of Consciousness Studies*, 11, 175–191.
- Thomas, P. (2007). Editorial: global boring. *Ecologist*, September 2007, 5.
- Tierney, W. G. (2000). Undaunted courage: life history and the postmodern challenge. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research*. 2nd ed. (pp. 537-554). Thousand Oaks, Calif.: Sage Publications.
- Tilbury, D., Janousek, S., Elias, D., & Bacha, J. (2007). *Asia Pacific guidelines for the development of education for sustainable development indicators*. Bangkok: UNESCO Asia and Pacific Regional Bureau for Education.

- Troman, G. (2000). Teacher Stress in the Low-Trust Society. *British Journal of Sociology of Education*, 21, 3, 331-351.
- Troyna, B., (1994). The 'Everyday World' of teachers? Deracialised discourse in the sociology of teachers and the teaching profession. *British Journal of Sociology of Education*, 15, 3, 325-339.
- UK CEED. *What is a consensus conference?* Available online at: <http://81.29.69.220/~ukceed99/engagement/info.php?record=81> (accessed 9 May, 2008).
- (UNCED) UN Conference on Environment and Development (1992). *Agenda 21: action plan for the next century*. Rio de Janeiro: UNCED.
- UNECE Expert Group on Indicators. Available online at: <http://www.unece.org/env/esd/SC.EGI.htm> (accessed 31 October, 2007).
- UNESCO-UNEP (1976). The Belgrade Charter. *Connect*, I, 1, 1-2.
- UNESCO-UNEP (1978). The Tbilisi Declaration. *Connect*, III, 1, 1-8.
- UNESCO-UNEP (1989). Environmental education means environmental solutions. *Connect*, XIII, 1, 1.
- UNESCO-UNEP (1990). Environmentally educated teachers: the priority of priorities? *Connect*, XV, 1, 1-8.
- UNESCO (2003). *United Nations Decade of Education for Sustainable Development* (January 2005-December 2014). Framework for a Draft International Implementation Scheme, July. Paris: UNESCO.
- UNESCO (2005). *Guidelines and recommendations for reorienting teacher education to address sustainability*. Education for Sustainable Development in Action. Technical Paper N° 2 – 2005, UNESCO Education Sector.
- van Dijk, T. A. (1998). *Ideology: a multidisciplinary approach*. London: Sage Publications.
- Van Maanen, J. (1988). *Tales of the field on writing ethnography*. Chicago guides to writing, editing, and publishing. Chicago: University of Chicago Press.
- Van Manen, M. (1990). *Researching lived experience: human science for an action sensitive pedagogy*. Albany, New York: State University of New York Press.
- Verhesschen, P. (2003). 'The Poem's Invitation': Ricœur's concept of mimesis and its consequences for narrative educational research. *Journal of Philosophy of Education*, 37, 3, 449-465.
- Walker, K. (1997). Challenging critical theory in environmental education. *Environmental Education Research*, 3, 2, 155-162.
- Wals, A. E. J., & van der Leij, T. (1997). Alternatives to national standards for environmental education: process-based quality assessment. *Canadian Journal of Environmental Education*, 2, 7-27.
- Wals, A. E. J. & Jickling, B. (2000) Process-based environmental education: setting standards without standardizing, in: B. B. Jensen, K. Schnack & V. Simovska (Eds.), *Critical environmental and health education* (pp.127-149). Copenhagen: Royal School of Educational Studies.
- Watson, M. (1999). *Lives of their own: rhetorical dimensions in autobiographies of women activists*. Columbia, South Carolina: University of South Carolina.
- Webb, M. (2007). *South Korea: mass innovation comes of age*. The atlas of ideas: mapping the new geography of science research report. London: DEMOS.
- Webster, R. (1990/1996). *Studying literary theory an introduction*. 2nd ed. London: E. Arnold.
- WEEC (2005) *Educational Paths towards Sustainability*. The 3rd World Environmental Education Congress, Turin 2-6 October.
- Weick, K. E. (1995). *Sensemaking in organizations*. Foundations for organizational science. Thousand Oaks: Sage Publications.
- Weinstein, M. (2006). Slash writers and guinea pigs as models for a scientific multiliteracy. *Educational Philosophy and Theory*, 38, 5, 607-623.
- Wetherell, M. (2001). Conclusion: debates in discourse research. In M. Wetherell, S. Yates & S. Taylor S. (Eds.), *Discourse theory and practice: a reader* (pp.380-399). London: SAGE.

- Wilke, R. J., Peyton, R. B., & Hungerford, H. R. (1987). *Strategies for the training of teachers in environmental education*. UNESCO-UNEP International Environmental Education Programme, Environmental Education Series No. 25, UNESCO Division of Science, Technical and Environmental Education, Paris.
- Wilsdon, J., & Willis, R. (2004). See-through science why public engagement needs to move upstream. London: DEMOS.
- Wilsdon, J., Stilgoe, J., & Wynne, B. (2005). The public value of science or how to ensure that science really matters. London: DEMOS.
- Woo, S. & Park, K. (2007). *880,000 won generation*. Seoul: Redian. (In Korean)
- Woods, P. (1977). Teaching for survival. In P. Woods & M. Hammersley (Eds.), *School Experience: explorations in the sociology of education* (pp.271-293). New York: St. Martin's Press.
- Woods, P., & Jeffrey, B. (2002). The reconstruction of primary teachers' identities. *British Journal of Sociology of Education*, 23, 1, 89-106.
- Wynne, B. (1992). Uncertainty and environmental learning: re-conceiving science and policy in the preventative paradigm. *Global Environmental Change*, 2, 111-127.
- Zeidler, D. L., Sadler, T. D., Simmons, M. L., & Howes, E. V. (2005). Beyond STS: a research-based framework for socioscientific issues education. *Science Education*, 89, 3, 357-377.
- Zembylas, M. (2003). Interrogating "teacher identity": emotion, resistance, and self-formation. *Educational Theory*, 53, 1, 107-127.
- Ziman, J. M. (2000). *Real science: what it is, and what it means*. Cambridge: Cambridge University Press.

APPENDICES

Appendix to Chapter 2. Environmental education in Korea

2.1. Stages of the Korean Environmental Movement (Ku, 2004, p.2004)

Category	Prehistory of the Environmental Movement (1960s–1970s)	The Anti-Pollution Movement (1980s)	The New Environmental Movement (1990s–Present)
Accidents and events •	Mercury contamination by pesticide (1978) Disease caused by air pollution from industrial sites (late 1970s)	Onsan Disease (1985) • Tap water contamination • (1989)	Tap water contamination • (1990) Phenol leakage incident (1991) Anmyeondo, Buan Anti-nuclear Waste Dumping Campaign (1990, 2003-2004) Anti-Donggang DaCampaign (1991–2000) Saemangeum (1998–present)
Environmental movement organizations	Not applicable	PRI KAPMA	KFEM GKU CCEJ YMCA/YWCA
Types of movement	Grass-roots victims' movement for damage compensation	Grass-roots victims' movement Radical NGO movement	Grass-roots victims' movement Modest NGO movement Realist environmentalism
Ideology		Leftist environmentalism	Environmental managerialism Ecologism
Issues	Pesticide Air and water pollution near industrial sites	Air and water pollution near industrial sites “Pollution Disease” •	Air and water • pollution in large cities Nuclear power plant and waste disposal siting Conservation/preservation (Donggang river) Global environmental problems
Activists	Farmers and fishermen near industrial sites	Farmers and fishermen near industrial sites Intellectuals College students	Farmers and fishermen near industrial sites Intellectuals College students Middle class Housewives

2.2. The abstract of “The National Implementation Strategy for United Nations Decade of Education for Sustainable Development”

(Source: Lee *et al.*, 2005, pp.108-112)

I. Introduction

- Chapter 36 of Agenda 21, “Education, Public Awareness and Training” which was adopted during the 1992 UNCED (Rio De Janeiro, Brazil) emphasized the key role of education in Sustainable Development (SD). After this, there have been various attempts to activate ESD for 10 years, but it failed in getting the results that we had expected.
- As a result, the 2002 World Summit for Sustainable Development (WSSD, Johannesburg, South Africa) again emphasized the importance of education and there was a suggestion that designates 2005 - 2014 as the UN Decade for Education for Sustainable Development (UN DESD). It was adopted in the 57th UN General Assembly, December, 2002. UN DESD is closely related to the New Millenium Goals (MDGs), Education for All (EfA), and the United Nations Literacy Decade (UNLD).
- UN DESD started in March, 2005. Also participating in this worldwide effort and developing and implementing national level strategy for ESD that emerged as an urgent task, is Korea.
- The objective of this study is to establish the national strategy for implementing ESD effectively in Korea during the UN DESD. This study was conducted for 3 months starting on March 10, 2005 and ended on June 9, 2005. The extent of this study includes defining the basic concept of UN DESD, grasping the international trend, evaluating domestic ESD level, and developing the national ESD strategy and suggesting policies based on the evaluation.
- The methods used in this study include systematic analysis of international or national level documents such as UN DESD - Draft International Implementation Scheme (UNESCO, 2004) and other web materials and various publications, interviewing related persons, surveys, expert meetings, etc.

II. International Trend on UN DESD

- To establish the national strategy for ESD in Korea, other countries’ ESD policies and current status or their preparations for ESD and DESD strategies were investigated. Especially, the methods and procedures to establish such polices and strategies as well as contents of strategies themselves were examined.
- The targets for examination were selected according to the region and development level. They

include New Zealand, Taiwan, Germany, United States, Brazil, Sweden, Great Britain, Japan, China, Canada, Kenya, Thailand and Australia. The implications from the analysis results are as follows:

- The relationship between ESD and SD promotion strategies needs to be strengthened further.
- National level secretary or committee for ESD strategy establishment and implementation needs to be designated under the ministry or beyond.
- Participatory methods need to be used in the process of ESD strategy establishment and implementation.
- The related governmental bodies need to cooperate and help with each other.
- Sharing the roles among the government and ESD stakeholders is needed.
- Integrated and interdisciplinary approach is needed to prepare the detailed action plans for ESD.
- Discovering practical excellent cases and the efforts to publicize them are needed.

III. Current Status of ESD in Korea

- The current status of ESD in Korea was checked through various indices, research on various documentations for ESD status about schools, society, enterprise, and higher educational institutions combined with research on each area's expert association, college students, teachers and people who are in charge of local Agenda 21. The results are as follows:

1) School

- The overall entrance examination system is the major obstacle, and the awareness level of teachers and the board of education is very low. There are almost no related initiatives in the name of ESD.
- ESD in school can be implemented through the connection with curricular activities, extracurricular activities and discretionary activities.
- The excellent cases should be discovered among the whole school initiatives such as Environment Protection School, School Forest Movement, UNESCO Associate Project, Alternative Schools, etc. Also, there should be some efforts to publicize those cases.
- ESD should be approached as the re-orientation of the whole education process not as an individual curriculum or educational content. The whole school initiatives should be encouraged to change the school ethos.

2) Society

A) Agenda 21

- SD related educational activities are being carried out, but most of them are environmental education oriented as a part of education. Also, they are not integrated into ESD.

B) Social Organizations

- The ESD of social organizations includes environmental education, human rights education, unification education, peace education, etc. However, the overall connection with ESD is not satisfactory. Especially, they initiated and spread various field trips, environmental camps, etc in environment education. But most of them are one-time event and developing the regular ESD programs is needed.

3) Private sector

- The role of private sectors in ESD is very important, because it can support partnerships among school, society and various networks and organizations in many ways. There are some cases, but they are not so active overall. Therefore, the participation of private sectors in ESD is needed.

4) Higher Educational Institutions

- There are no explicit approaches in all areas including literacy education for SD, expert fostering course, ESD expert fostering course, etc. which can be done by higher educational institutions including universities, research institutions, etc.

IV. The Direction of National ESD Implementation

- This study suggests key areas, 7 principles and 7 directions for national ESD implementation.
- It is suggested that the contents of ESD key areas reflect special contexts in Korea based on the suggestions of the UN. The additional contents include resolving conflicts, unification, social innovations, partnership, media literacy, biodiversity, disaster prevention/minimization, transportation, sustainable production and consumption and reducing the gap between the rich and the poor.
- The 7 principles for ESD implementation which are suggested in this study are as follows: they include the innovation through participation, respect for social equity and diversity, integrated approach, education for all, lifelong learning, long-term perspectives, and positive consideration for environment.
- The direction for ESD implementation in terms of establishing and promoting the detailed strategy are as follows: It should include the emphasis of collective and collaborative learning, integration of ESD related innovation policies, integration of ESD and knowledge based society concept, pursuing sustainable development and educational development at the same time, reflecting unique contexts of Korea, orienting for broad collaboration based on global perspectives and sustainable

environmental management.

V. National ESD Implementation Strategy

- The national ESD vision which is suggested in this study is “Sustainable Development and Sustainable Society, Led and Shaped by Education”. In this vision, every individual or group participate and study the values, action competency, and lifestyle for sustainable development and living together, which lead to a sustainable society.
- The objectives of national ESD are as follows:
 - Both individuals and groups share the vision and high awareness for SD
 - Both individuals and groups are equipped with the capacity for learning and implementing SD
 - Multi-stakeholders of ESD have strong partnerships and solidarity through active communication
 - Both individuals and groups participate actively in creating SD and a sustainable society.
- The national implementation strategies to achieve the vision and objectives of ESD are as follows:
 - Construct the system and base for the settlement and activation of ESD
 - Enhance the awareness of ESD through a participatory approach to share the vision and secure a sense of ownership
 - Build the capacity of learning and implementing SD for both individuals and groups
 - Strengthen the communication and partnerships among stakeholders of education and SD
 - Make education and learning as a key strategy for SD and a sustainable society through its practical actions in various levels.
- The national ESD implementation strategy includes 8 policy recommendations and each policy recommendation includes current status, problems, suggestions for improvement as tasks, index, etc.:
 - Construct the legal and administrative base for ESD
 - Construct the national implementation system
 - Establish and implement the vision sharing plan to improve the (E)SD related awareness through a participatory approach
 - Expand the opportunities of education and training for building capacity for SD

- Establish research and development system for supporting ESD.
- Strengthen the solidarity and communication among ESD stakeholders
- Promote the integration of SD and education through practical action
- Establish the monitoring and evaluation system for implementation and improvement of ESD.

VI. National ESD Implementation System

- After consultation process with experts and civil groups and discussion with other ministries on the national ESD implementation strategy, it is needed to be followed by establishing ESD national action plan through participation, securing ESD implementation system and financial sources.
- Also, developing and implementing the detailed actions, establishing monitoring and evaluation plans are needed for future promotion.
- In the process of consultation, investigation on the ESD status and establishment of action plan for ESD, participation of various stakeholders should be included, which could be the process of learning SD or ESD.
- Developing and implementing the detailed action plan for ESD should contribute to the concretization and realization of ESD.
- The things to consider for promoting ESD related policies are as follows:
 - Integrating existed national innovation tasks, central and local government and governmental bodies.
 - Pursuing top-down and bottom-up approaches at the same time.
 - Linking with existing organizations like local agenda 21, network, etc.
 - Improving the role of enterprises and higher educational institutions.
- Among these things, the initiative efforts of the government and connection with other governmental bodies or various sectors could excel the promotion of ESD. Especially the positive attitude of the Ministry of Education and Human Resources Development (MOE) can be crucial for the future promotion of DESD and its success.

Appendix to Chapter 4. Descriptions of the research process

4.1. Searching for teachers and teacher's stories (interview design, process, initial reading)

4.1.1. Interview Design (for first interview in June, 2005)

Aims

Despite many initiatives to define and promote environmental education at the national and the international level, the practices in schools do not always happen in accordance with dominant theories or discourses. In Korea, environmental education in school is gaining currency; however, its implementation is still in the hands of teachers who are willing to do extra work in order to find a space for environmental education in the overcrowded curriculum. The quality of environmental education cannot be judged until we understand what is actually going on in schools in the sense that 'environmental education will occur in schools only when it becomes part of the teacher's story', as Hart and Nolan (1999) pointed out. From this perspective, this research aimed to gain a deeper insight into teachers' experiences of environmental education by looking into how teachers construct their own stories of environmental education.

To achieve this goal, the following questions need to be answered:

- Why do teachers engage in environmental education?
- What are their definitions/views of EE and how do these influence their teaching?
- What influences or constrains their work?

In so doing, this research was particularly concerned with the gap between dominant discourses that set goals, curriculum, and teachers' roles, and the teachers' own definitions of education (and environmental education)⁴³. Thus it was envisaged that the research outcomes would ultimately be to explore the contextual meaning of 'environmental learning' and 'teacher discourse' in environmental education⁴⁴.

⁴³ For example, Stevenson (1987) points to inconsistencies between school culture and ideal of environmental education. In order to develop detailed analysis, further review on current research is necessary to look into how languages of environmental education (including sustainable development education in the UK) are variously defined and put into practice in the forms of curriculum, and how teachers' role is viewed in the discourse.

⁴⁴ Fundamentally, I am interested in how various social groups gain their own perspective of the relationship between the

Interviewees

Who was I going to meet?

- Science teachers at secondary schools who were:
 - Inhabitants of the Seoul and Kyong-ki province (the area surrounding the capital)
 - Had more than 5 years working experience
 - Were involved in environmental education

Environmental education in school might be implemented in every subject and at every level; this research, however, was to focus on science teachers at secondary schools to gain a deeper insight into learning and teaching experiences shared or differentiated by teachers who were assumed to have a similar disciplinary background. The criterion ‘involved in environmental education’, included environmental education activities implemented by teachers’ own initiatives rather than environmental topics that were given as subject matters. The area was restricted to within Seoul and the nearby area, but was to be flexible depending on the people I could approach. Given this, a comparison between areas, i.e. urban and rural was beyond the scope of this research, in relation to the individual teacher’s thinking. Experienced teachers would be favoured under the assumption that they could clarify their own definitions and conceptions of environmental education. The sample size of around five to eight was thought to be the minimum required for constructing teachers’ stories.

One thing to bear in mind is how I defined ‘teachers involved in environmental education’. One teacher introduced to me told me that he would not be an appropriate person to research because he defined himself as a science teacher who was involved in the environmental or educational movement but was doing little for environmental education in a school. Then he proposed that he could introduce other teachers he knew if my criteria for choosing teachers could be made clearer.

Perhaps this teacher might have defined environmental education teachers in terms of introducing environmental subjects in the classroom or operating extra environmental education activities such as an environmental activity club. My research focus required data on what and how teachers learn about/from environmental education, not on observing what they do as environmental education. A difference between his and my definition of environmental education lies in whether a focus was on

environment and their lives, and how learning contributes in this, or how learning can acquire contextual meaning. In the case of teachers among various social groups, they can be assumed to be environmental learners who build an understanding of environmental thinking through their own experiences of involvement in environmental education. In this research, the focus will be placed on how teacher’s environmental learning is fashioned in terms of teachers’ work of which definition is presupposed and constrained by social and cultural assumptions and their operation.

teaching or learning. Even though he could not be regarded as ‘an environmental education teacher’, he could be a relevant case study for ‘learners’.

From this I realised I had used the term ‘an environmental education teacher’, which had a connotation of defining environmental education as curricular or extra curricular activity. Looking back, I did not doubt the use of the term, ‘environmental education’; for example, my research question, “Why do teachers engage in environmental education?” In the search for a relevant case study, a broad spectrum of teacher thinking and experience was to be taken into account. I realised I would need a different conception of what they’re doing, and further consideration of research aims and questions.

How could I find interviewees?

It was most likely that I would rely on personal relationships to find people. I made contact with my colleagues who had studied or were then studying on the graduate programme where I studied, and asked them to introduce me people satisfying the criteria above. An alternative was to get hold of a list of people who were involved in government or NGO projects and then to get in touch with them personally.

Two teachers

It is necessary to address how I came to contact two of the people as this process encouraged me to further reflect on my use of the term ‘environmental education’. After deciding to research teachers, I asked some my colleagues to introduce me to ‘teachers who are doing environmental education.’ Through direct and indirect personal contact, I came to get names of approximately ten people who were recommended as enthusiastic teachers. I did not contact all of them because my intention was to construct the stories of teachers with different experiences. My research at this stage was more concerned about explorative and descriptive inquiry based on the teachers’ unique stories from which further research questions could be developed. Several of them belonged to the same teacher’s group that pursues ecological education; thus, I finally decided to contact these two unique people.

Both contacts were science teachers with more than ten years working experience. It is notable that both were what we call ‘386 generation’ which means born in the 1960s, entering university in the ‘80s, and now in their late thirties (or early forties). This generation had the shared experiences of turbulent political change and student movement⁴⁵. One of them was recommended for her extensive and

⁴⁵ A nearly 20 year long dictatorship finally ended in 1979 after the president Park Jung-Hee was assassinated by his right hand man, but the succeeding military government also oppressed democracy and freedom which brought about a radical student movement and political turmoil during the 1980s. After a nationwide protest in 1987 marked a turning point, a non-military, democratic government was formed by direct election. The ‘386’ generation refers to the people who

passionate involvement in Science-Technology-Society (STS) education, and environmental education in an NGO. The other was recommended for his contribution to the establishment of a teacher's group and his involvement in environmental education in school through extra-curricular activities. When asked to be research participants, both agreed but seemed to be unsure whether they were 'environmental educators', "not an environment teacher, but more interested in environmental education than other people" (as they saw themselves), or "a science teacher, so with little engagement in teaching but more in educational movement". Their identification in this way enabled me to reconsider my original idea of 'teachers who are doing environmental education'. I tentatively decided to call them, 'environmentally conscious teachers', and this concept seemed useful in questioning the term environmental education and environmental educators. This was also a good starting point for an inquiry into 'identity'.

Stories about what?

To construct life histories of these two teachers, the main focus was to be placed on teachers' narratives in terms of following aspects of experiences and storytelling:

- Why are you engaging in these activities?
 - How are these activities related to the environment?
 - Why is the environment an important issue in my life?
 - Life long, everyday experiences and contexts
 - Which events and contexts are conspicuously mentioned and which are not?
 - Underlying beliefs and values
 - Contexts of change and agency

At this stage, the intention was to listen to the stories of teachers without imposing any concepts and ideas of my research interests. As such, not only the stories themselves but also the way the stories were 'selected', and their narrative style were crucial points to focus on. Furthermore, it required my own understanding of cultural, social and educational contexts that are noticeably addressed and re-emerged in the stories.

- Education, the environment, and environmental education

experienced the student movement and radical political change in this period. They are now considered to field powerful political leaders in the political parties and NGOs. But it does not necessary imply all members of the generation have shared ideologies and experiences, and in this research, generational characteristics is assumed to reflect cultural context.

- What do I intend to do through these activities?
- How my personal commitment to the environment (or education) is translated or not translated into my work? Why, why not?
- How can I possibly define environmental education in the light of my own experiences?

This part was to address some concepts and ideas of environmental education, but questions were intended to initiate the stories rather than to get specific answers as in the structured interview. I was to use the term ‘environmental education’ on the understanding it has a very broad meaning. A teacher’s confusion and unawareness on this term was important in that it lead to a deeper understanding of their definitions on educational meaningfulness of any practices related to the environment. Overall, all the concepts and theories such as the environment, environmentalism, environmental education and even education were assumed to have multiple and contradictory meanings.

4.1.2. The first interviews and illustrations of the development of interpretive frames (September 2005)

Searching for cases

When I contacted two teachers to request interviews, the teachers seemed confused about my definition of ‘teachers who are doing environmental education’. The term environmental education is associated with subject matter, and teachers’ environment-related activities tend to relate to their own context. The teachers tried to make sense of what they had done as a teacher and as an environmentalist (in a rough sense) in order to identify and make significant changes in their lives and work. This illustrated the complexity of teacher’s work since it inevitably related to their personal identity. However, this is also the point where environmental knowledge and relevant pedagogy are continuously formed and re-examined. Accordingly, in dealing with teacher’s stories, it is important to attend to tensions and challenges that teachers encounter when they attempt to fulfil their beliefs and values. It means a shift of a focus for the research inquiry from (simply) ‘personal’, ‘enthusiastic’ stories toward discursive practices in which dominant discourses and cultural knowledge come into play. This leads on to attempts to analyse ‘narrative style’ as a sensitising process for further discourse analysis.

Narrative style

In Han’s narrative accounts, for example, it was noticeable that she switched her voice between a ‘critical’ one and a ‘moderate’ one. A critical voice appeared when she remarked on her own views and values, and her critiques of discourses and other people’s ideas. In a critical voice, she was convinced, determined, and radical. For example, she recalled a bad example of traditional environmental education that she regarded as a very bad approach, trying to argue for ecological sensitivity as a better approach:

At the previous school, once I fought against the school. Our school was one of the “so called” ‘model schools of environmental protection’. But the school took all the trash bins out of the classrooms to reduce garbage, and then distributed plastic bags to pupils to force them to take their own trash home. Such violence! That’s the fallacy of traditional environmental education. I thought it gave only bad impressions of environmental education to pupils. It was such a ‘tighten your belt’ ideology!

However, in the context of the ‘whole story’ of the interview, a moderate voice became dominant, and this was evident as she recalled how difficult it was to make practical changes, and how different people’s views were. Describing the teacher’s group that she was leading, she tried to avoid straightforward critiques of other teachers’ ideologies by using moderate words:

It is very interesting that we’ve never been so keen on debates, examining our own ideologies, never.... A funny thing is not one of us has ever studied sociology of science before.

She talked before of how difficult it was to motivate teachers to participate although she felt that it was very important studying sociology of science. But in reality, teachers' views and knowledge varied, the focus of discussion in the group was likely to be on how to teach this knowledge rather than debating critical points arising from differences in points of view. Often she faced challenges in making her argument. As her radical view became dressed in a moderate voice, she actually expressed powerless feelings:

Nobody seems to disagree with the idea of environmentalism. When I talked of animal rights, vegetarianism, they usually mumbled. "Yeah, you're right. I see your point.".... But here's the thing, Nuclear energy, "it's indispensable, and very safe!" Their voice would get stronger. At the time, it's likely to become a dispute... On that issue, many teachers object to me.... After all, I just accept the difference.

This narrative style enables me to see how she constructed different ideas and discourses in the narratives. It was apparent that she recognised conflicting discourses such as a traditional environmental education approach vs. ecological sensitivity, hard science vs. STS movement, and conservative vs. progressive teacher discourses. Engaging in environmental education meant she had developed a more radical and critical view, but her narrative style revealed something of the challenges, frustrations, and confrontations she faced in the reality of teacher dialogue and practice. Through such initial analyses, further inquiry will be required to investigate how teacher identity and learning can be addressed through discursive understanding of narratives.

4.1.3. Focus group interview

Initial ideas

1. Focus of inquiry

- Gaps between official narrative and teacher experiences
- Becoming an environment teacher

2. Interactive discussion sessions

- Personal life histories and teaching experiences
- Collective identities and multiple meanings

Main discussion

1. Who/What do they think they are/do?

- Environment teacher as named / as hoped / as experienced
- Why/how did I become an environment teacher?
- Am I an environmentalist? What's the boundary between movement and education?
- What does it mean by environment teaching?

2. How do they interpret the languages of environmental education?

- How does literature shape certain meanings of the languages? How do teachers use those languages to describe their experiences?
- Education about/in/for the environment
- (sustainable development, pro-environmental behaviour, nature experience, ecology, etc.)

3. How do we better teach environment?

- What is environmental knowledge? (Interdisciplinary approach, decision-making in environmental issues, etc.)

Interview questions (January 2006, interview duration: 3 hours):

In the actual interview, my role was to facilitate conversation and discussion among teachers, to build up a sense of understanding and sympathy by sharing their own experiences and difficulties as low status curriculum teachers and novice teachers.

- How did you become an Environment teacher?
- What are your experiences as an Environment teacher in schools?
- What are the differences among pre-service training courses?
- What is your focus and interests in teaching?
- How do you feel about constraints from the school curriculum and system?
- How do other teachers think about the Environment subject?
- How do you think teachers who are engaged in environmental education out of their own initiatives are different to you?
- What do you think about the status of the Environment subject in the National Curriculum?
- What do you think about the low selection rate of the Environment subject in schools?
- What kind of activities and teacher collaboration did/do you engage in?
- How is your personal life in terms of 'pro-environmental behaviour'?
- Do you have any particular topics of interest in environmental issues?

4.1.4. Example letter for interview

Dear XXX

Thank you for expressing your interest in this research. I am pleased to have an opportunity to share our thoughts and experiences about environmental education.

In relation to research ethics, I would like to inform you as follows:

The research aims to understand teachers' points of view and experiences in relation to environmental education.

The interview will take place for 1 or 2 hours, and I would like to hear about what you think about your experiences of environmental education, and personal interest and ideas about education in general. It will be recorded in the form of electronic files.

Matters of confidentiality: Interview will be strictly used only for the research, and your name will remain anonymous.

I look forward to seeing you.

Sincerely,
Se-young Hwang

4.1.5. Example of application of three research questions (May, 2006)

Notes on the process of developing Young's story

My research questions relate to:

- How diverse is their 'environment' teaching?
- What are things they can and can't teach?
- How did environment-related activities change their life courses and ideas of life?

Then, the main themes can relate to these three as follows:

- Young's experiences on STS group and education
- Conflicts/difficulties/challenges she faces in family and school
- Her interpretation of the significance of the experiences

Drawing a diagram of the whole story (see the next pages)

- The diagram needs...
- Major categories (and the relationship between them):
- Being a teacher / Science teaching / Environment Teaching
- Can't do / Can do / Want to do (and its context)
- Life course and identity change
- Arrows and points for making connections

Focus 1. What is environment teaching to her?

- STS activities encouraged 'changes' in teaching and life.
- Science teachers need a critical eye, so do pupils.
- Seeing science with different perspectives
- Not infusing but inducing pupils' own investigations
- Biotechnology issue
- Not frequent use of the term environmental education
- environmental education as something prescribed from the policy

- (how personal and professional identity interact one another, contrasting with ‘EE’)
- (how terms such as ‘science’, ‘environment’, ‘EE’ are used, and it shapes ‘environment teaching’; as in Han’s narrative; comparison between/cross subjects?)

Focus 2. What I do / want to do / can’t do

- STS: learning from experienced teachers / diverse views, balanced approach / pupils hate participation, discussion / deal with different opinions / a packed timetable
- Ecological lifestyle: having interest what I can do in my context / food issues / financial pressure
- Collaboration with other teachers:
- Teachers rarely talk; school culture in teachers’ group, discussion is usual. (how cultural politics and educational discourse constrain narrative identity)

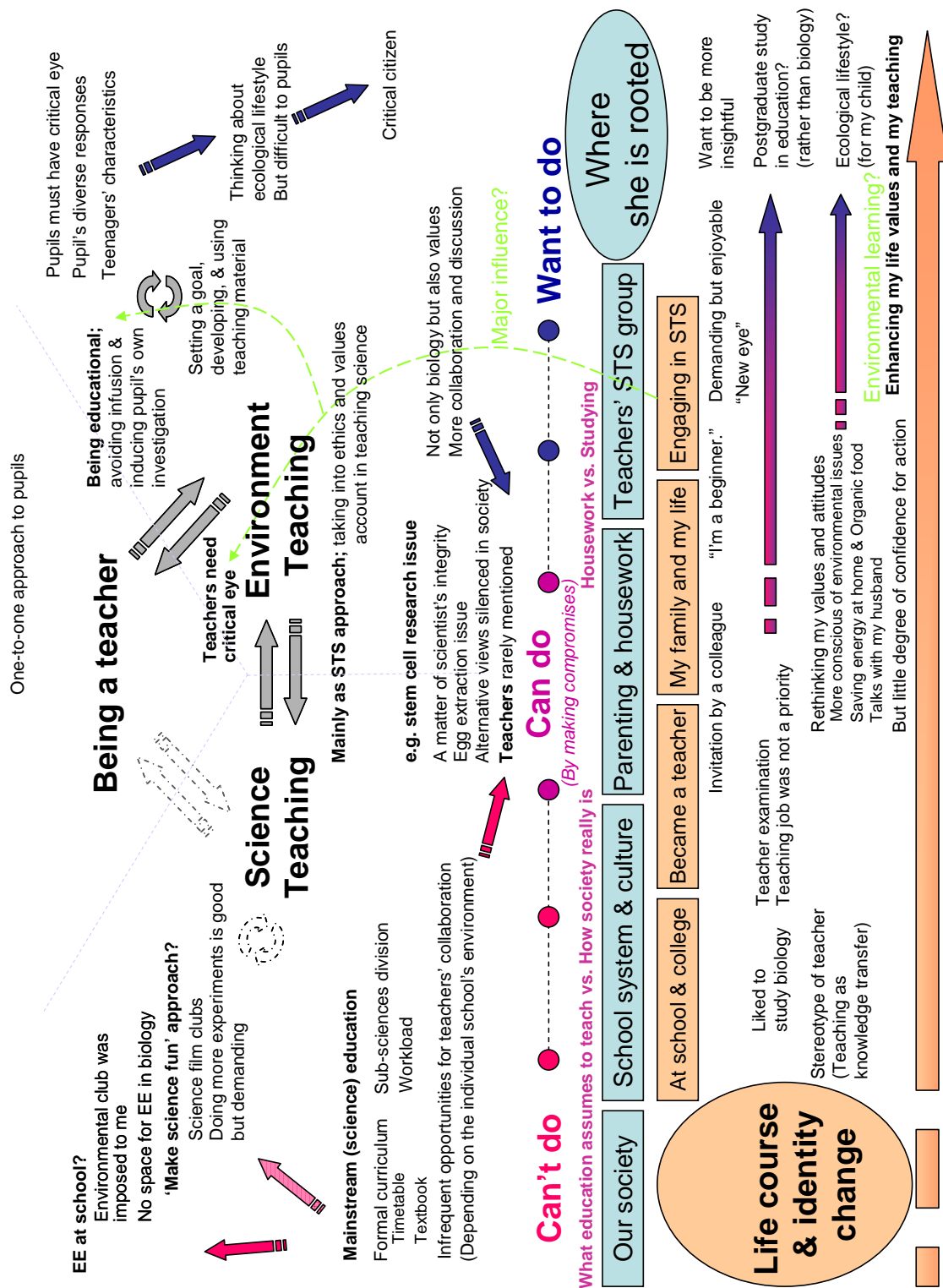
Focus 3. Life course and Identity change

- School & college: what might teaching be like?
- Becoming a teacher: what teaching actually is
- Marriage & parenting: between I want to do and I should do, new interests
- Got involved in teachers’ STS group: critical incident

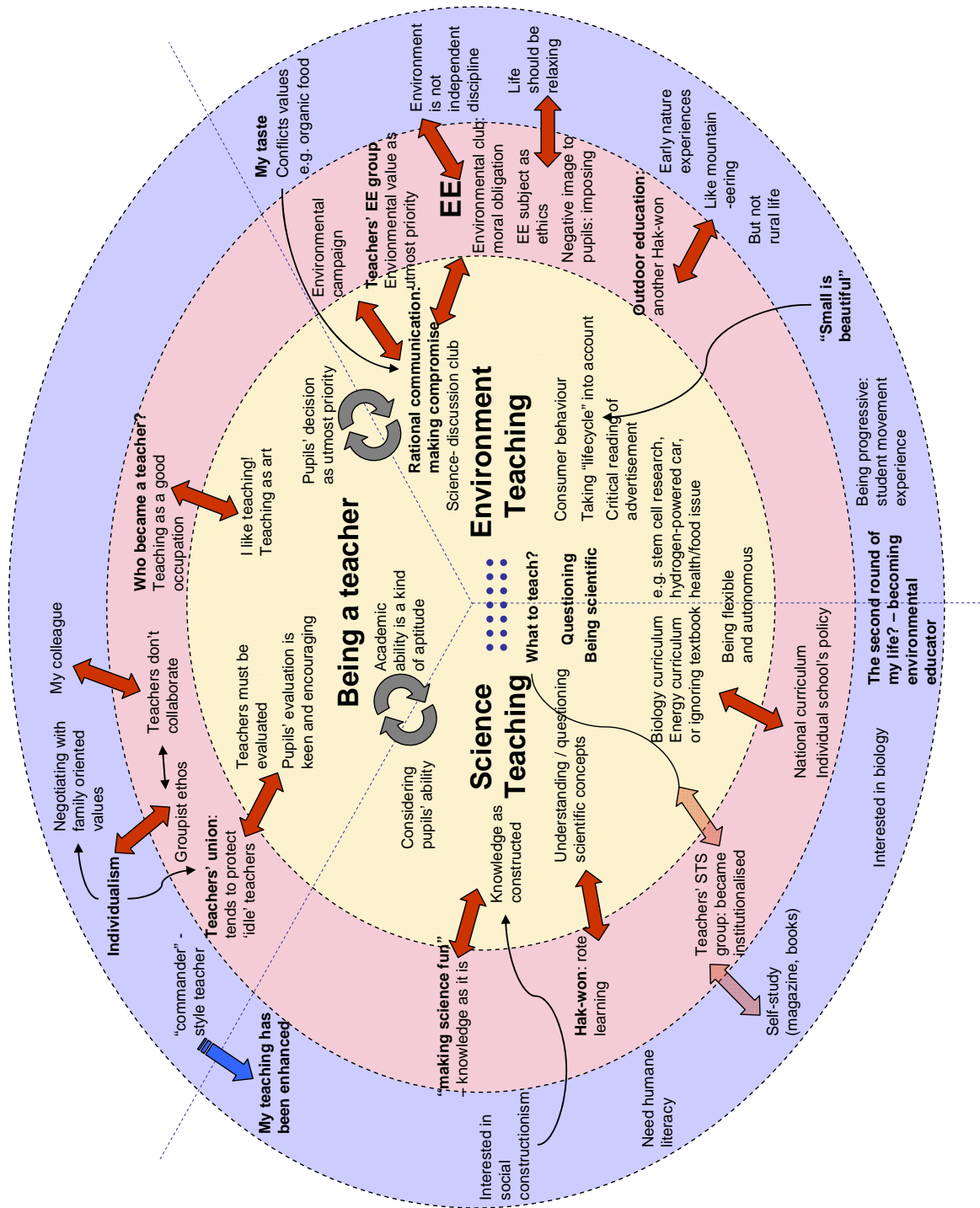
Comparing Young’s and June’s stories

- Focus 1: conceptualising ‘environment teaching’
 - Similarity: in science teaching/ science with other values/ skeptical about environmental education / interdisciplinarity
 - Want to be more critical vs. don’t buy me
 - Learning attitude vs. personal disposition
 - ‘I have changed’ vs. ‘It suited me’
 - Teaching > personal value vs. personal value > teaching (not linear)
- Focus 2: challenges in environment teaching
 - Making compromises (explicit in ‘can/can’t’), being confused vs. being individualistic, autonomous

- Enabling & constraining factors vs. being critical about all discourses, sticking with my taste
- Commonly addressing curriculum & school ethos (induced by the question to some degree)
- Focus 3: life-course and identity change
 - STS group experience vs. My taste & disposition
 - Rethinking my values vs. up to what is joyful or necessary
 - Change (before/after) vs. formative (forms of narrative)



Young's stories



June's stories

Mode of interaction



disabling/not helping



enabling/promoting



4.2. Developing teacher narratives of environmental education

4.2.1. Example of interview summary

Part I. Interview context

Name: Young

Interview Time / Date: 12:00-14:00, 20th January 2006

Personal information:

Young specialised in biology education at university. She passed her teacher examination in 1999, which qualified her to teach science (or biology) at state-run secondary schools. She has been teaching biology at a secondary junior school for eight years. Since 2004, she has taught at the current school, which is located in an affluent inner city area in Seoul. She has been married for five years, and has a young baby. Since 2000, she has engaged in the Teachers' Science, Technology and Society (STS) Group⁴⁶ through invitation from a teacher colleague who she met at the previous school.

The context:

It was by a coincidence rather than my plan to decide to interview her.

Young was a senior to me at the department of biology education at college, but we had not met since 1998. I found her name among the authors of the book that the previous interviewee (Han) gave to me. Aware that the book was written by the Teachers' STS Group, I became interested in what made her engage with the group and STS education.

Looking back, she seemed to be a hardworking student without any particular interests other than studying. From my image of her, encountering her name in this way was quite surprising and unexpected. But it was also a good motive for interview.

I got her email address from Han, and tried to contact her. At the first email, she felt sorry for not remembering me, but approved my interview request. While she was not sure of the appropriateness of her case for my research, in my judgement from Han's interview, I expected Young's experiences to have good potential as environment teaching stories, through enabling her to take critical attitude toward science and scientific knowledge. (And my expectation turned out right as she made clear her

⁴⁶ The group was initially set up by the initiative of Centre for Citizen Science (NGO), but has been an independent teachers' group since 2004. The group aims at STS (Science, Technology, and Society) education by taking into account of values and ethics in teaching science. The members are mostly incumbent science teachers, and collaborate to develop teaching materials and to gain more understandings of recent development in STS-related knowledge.

interest in bioscience and technology and how to deal with related knowledge and issues with pupils from the beginning of the interview.)

The main focus of interview:

Given this context, my questioning started by asking Young about the motivation that led her to STS education. As she considered the Group experiences had changed her values and attitudes, I was able to focus on the context of those experiences and their influences on her teaching and life, in a broad sense. In particular, the focus of our conversation was placed on her ideas and attitudes regarding how she, a science teacher, deals with controversial scientific issues in teaching, as she was naturally able to address the current stem cell research fabrication.

Part II. Interview summary⁴⁷

When I [Young] got involved in STS education...⁴⁸

I started teaching in 1999, and the Group was set up in 1998. It aimed at developing a critical literacy about science. I wasn't aware of the Group, but my colleague invited me to become involved. At the time, they were in need of a biology teacher, so I joined.

I didn't actually have an interest in STS before then. It struck me only as a conceptual idea I learnt at college when I studied for my Teacher Examination. Since then, I have realised what STS actually means.

I don't think I'm very confident about this area, but I enjoy learning from these teachers. What kept me here is a special bond between us, and that there's a lot I can learn from the people. To be honest, it's demanding for me to develop materials and then to apply to classroom teaching, because... we have to deal with value issues in science. There's no space for values in the school curriculum. To teach our materials, I have to try to find extra time. And in the actual teaching, pupils don't like to think, judge, and present ideas of their own. It takes energy to push them to participate. Another concern is that we set a goal in teaching, wishing pupils think this way, but we can't just impose on them. Pupils may have different ideas. Our principle is that the decision should be made by the pupils. But still, it's hard to remain neutral and to instigate pupils' own investigations.

⁴⁷ This part was selected and summarised from the interview transcript (young1.doc). Several questions were clustered by topic, and the attempt was made to keep the order of story as our conversation proceeded, but some changes are inevitable for more topic-centred summarising. Overall, the summary is expected to preserve the 'storied form' of the interview talk, not just a Q/A format. Thus, the strict application of transcription codes seems irrelevant when the flow and naturalness of conversation is given priority.

When we work on teaching materials, we usually separate the contents by each subpart of science, and each group works together. In that process, it's rarely the case that disputes occur. We try to accept others' ideas. Sometimes we convened a reading session when we found more progress was necessary. But people are busy and our meeting was the most likely dropped. For me, I'm a slow learner. I don't insist on a reading session but prefer to learn from experienced teachers. I'm still a beginner.

Since then, I have changed a lot.⁴⁹

I got involved in STS education just one year after I started to teach. Until then, my school life, college life... it was very much like 'a formula'. So, my teaching was like a formula too, and I was reluctant to make changes. But I have started to see things in a different perspective since I worked with them. STS education was effective for me as well, not just for pupils. And I often found pupils having more fun in this style of teaching. My attitudes and values have changed. For instance, stem cell research is a case in point. If I follow the formal curriculum, it only takes one or two sessions. However, I tried a different approach – I let pupils search the Internet and find pros/cons of the research. Pupils have various opinions. When some pupils told me, "I realised this issue should be cautiously dealt with," I was happy.

But this is not the mainstream science teaching.⁵⁰

That's true. I don't have many opportunities to see how other teachers teach. But mostly, we just tend to stick to the textbook. At my school, it's only me who teaches biology. So, there's no one to have discussions with. It's completely my decision what to teach. The teacher who invited me to the Group, she is brilliant. I observed her class and was impressed. She is really good at leading pupils' participation. Once, our group held a conference for teachers and received a good response from teachers. In the conference, such an approach is not usual, because most science teachers are not comfortable with critiques of science. 'Making science fun' is another approach I'm quite interested in. But the group who leads this approach tends to push teachers to produce outcomes, and to act like a big organisation or something. For me, our group is more suitable – a family-like, inspiring atmosphere.

I became conscious about the environment⁵¹

Environmental topics... umm, in secondary junior biology, there is no room for environment to fit in. It may fit with the 'lives and science' subject in the secondary high school curriculum. In my case, it's hard to teach environmental topics. Once I thought to introduce 'ecological lifestyle' to pupils, when the

⁴⁸ Cluster 1 derived from Q1-9.

⁴⁹ Q10, 11

⁵⁰ Q12-18

⁵¹ Q19-26, 40

media dealt with this topic a lot. My idea was to let pupils watch one of those programmes and think about the meaning of this lifestyle. However, pupils wouldn't find it interesting because they are too young to think about issues that are too big.

Personally I tried to keep myself interested in this 'ecological lifestyle'. I'm not brave enough to act now, but I carried on thinking about the formative influences it can bring on my child. Any action change needs a change of mindset. I'm far from those high levels of change. I wasn't used to thinking about such a lifestyle before. At college, I had to study hard to get scholarship. I wanted to become a science researcher, and teacher was the second priority. I led a monotonous life at that time. But now I want to study education-related fields that will enhance my understandings of pupils. These kids are a totally different generation. But it will be some years later because of my baby. There's a conflict I face between what I want to do and what I have to do since marriage.

I found myself getting more conscious about these issues since I became involved STS education. Once on my visit to hometown I saw part of a mountain cut and turned into a construction site. It didn't strike me that this would benefit people who lived there; rather, my worry was that we're losing nature's beauty. My husband and I sometimes talk about daily environmental issues in passing. At school, I'm not knowledgeable enough to give a lecture or anything about these, but sometimes I talk with teachers and pupils when some issues are publicised by the media.

Club activities at school⁵²

This year I showed the pupils films such as 'Harry Potter and the Goblet of Fire'. I consider club activity more as refreshment than study time. At the science film club, pupils are encouraged to write down how they think about the film, and to try to find out any scientific knowledge from the story. They are quite good at this.

In the second year of teaching, I took charge of the environmental club. The problem was... if a teacher takes the initiative of running an environmental club, it could be worthwhile. But the environmental club at school is forced to run by the Office of Education. The teacher in charge has to take on a burden without any developed programmes. I didn't know what I should do. Once I took pupils on a tour through a nearby sewage treatment plant. Then, we would just pick rubbish around school, and that's all we did for the whole term. For club activities, I prefer the science film club because it's more fun. And what else... science experiments! Pupils do experiments in the science class, but there're plenty of interesting things to do.

⁵² Q31-35

Our society puzzles me regarding what I should do as a teacher.⁵³

Lately, the stem cell research fabrication issue threw our country into turmoil. Almost all the people in the country were shocked and devastated. Teachers at school deplored how faithfully they believed the research would bring our country tremendous benefits. People who questioned the integrity of scientists were only a minority of the society. Science teachers were not different at all. People were so obsessed with the existence of stem cells, without much care about other critical issues. My opinion is that I thought it was a shame on our country. How dare the research team deceive Koreans and the world? I think if there'd been a strict and continuous watch on the research with a critical view from the outset, we wouldn't have had the worst situation. For instance, the egg extraction issue... I can't believe they treated the women's body in that way. Along the way, our group kept an eye on how the egg issue would be framed, doubting the number of eggs arguably used in the experiment. The eggs would be treated as just one of the tools for experimenting. Everybody has a patient in their family, and the research was so hopeful in this aspect. I was confused too. However, once I imagined a woman at bed waiting for her eggs to be extracted, I couldn't ignore the ethical issues. If I was asked to donate eggs, I wouldn't do it. But in the whole period of the controversy, alternative views were silenced in the media and the public.

The whole situation puzzled me. Our society seems to be run by some kind of hidden power and profit-driven ideology. However, school education teaches we must live morally and honestly, demanding us to ignore all the ugly things behind that pretension. Pupils get confused between what they see our society and what they learn at school. Then, what am I supposed to tell them as a teacher? Once, one pupil came to me and asked seriously about the truth of the research. I just told about there are lots of problems in the processes of research, and scientists mustn't ignore any of them. I tried hard not to infuse my own idea, letting the boy know there are opposing views around the issue. At this school, teachers didn't talk about this publicly. It is kind of the ethos of this school. In contrast, I guess I was able to discuss with other science teachers at the previous school.

The type of teacher I want to be...⁵⁴

Does it relate to the interview topic? Umm... You're asking my reflection! (Interviewer: No way!) [both laugh] For me, umm... I like kids. But I'm not the kind of person who can handle many things at the same time. The class size is big, and I can't manage to give attention to every kid who just pops up here and there, all the time. So, I'd get shattered at the end of the year, although I made a plan at the beginning of the new term. My personality isn't really fit for a teaching job. - I'm not good at leadership or showmanship. Alternatively, I'm making every effort to meet one-to-one. I talk with one kid in person, just gradually sneaking into their mind [both laugh] rather than instructing in front of whole

⁵³ Q41-48

⁵⁴ Q27-30

class. I gained a lot from one-to-one meetings. I thought this kid was hostile, but actually, he was sentimental. And deep inside, there's a reason behind his behaviour. This is how I approach kids – like hugging, if you like. And this is what I gained from my teaching experiences. My previous image of a teacher was to give knowledge to pupils. The knowledge can be gained from other sources, such as the Internet, not only me. But teaching is about interactions, seeing with a pupil's eye. I've not yet come to any conclusions about this, but I learnt a lot from this realisation.

In this way, kids became my treasure. Some kids still contact me after graduation. Last year, there was this boy at the peak of puberty. His conduct was uncontrolled and malicious. I spent a long time talking with him, and I could see he became more agreeable than before. However, I can't achieve 100 percent. The other way around could be the case. But it is worthwhile.

Living as a teacher demands continuous learning.⁵⁵

I want my pupils to be able to see the world from diverse perspectives. For this, I'm trying to tell as many stories about the aspects of our society and the world as I can. I'm not a good lecturer, but I want to give pupils the feeling that this teacher teaches not just biology but also many different things about the world. When it comes to biology or science, I want pupils to think in many different ways, bearing ethics and values in mind so that pupils can read what the media say with a critical view.

Another thing I want to do is make a closer bond with each pupil. I'm achieving just 30 percent in this, but I'm improving. We'll cherish this memory afterwards.

I realised teaching needs continuous learning. What I'm doing is, I learn from teachers in the Group, read books, and clip newspaper articles for later use. I like books that have insights into the twists and turns in scientific research. It takes so long for somebody to form one's ideas and values. Changes aren't made just out of the blue. In the meantime, we need to meet people, try out something new, and experience something unexpected. I feel I've just started on the journey. I sometimes find it stressful and demanding, but living as a teacher demands insights into society as well as subject knowledge.

Living up to ecological values⁵⁶

I'm struggling with food shopping. Organic food is pricey. I wish I could feed my baby more clean and safe food. But I'm trying to save water at home, not to use too much washing powder. Are they not so trivial? Umm, I'm not totally free from materialist desires at the moment. When I was pregnant, I would go to spiritual gymnastic class, and have an interest in organic food for my baby. However, it takes so

⁵⁵ Q49

⁵⁶ Q50, 51

much energy to search for information and to actually go to the shop. I should blame my laziness for that. But I am occupied with work and housework all the time, so, I can't help it. Even so, food is a nagging issue to me, because of my baby. But I do care about a few things in cooking such as adding no chemicals, although my husband complains of taste. We talk about trivial things, such as housework. But it's not often the case that we sit down and discuss or share ideas about this lifestyle.

At school, I can't find time to talk about it with other teachers. We are always occupied, and don't usually talk about anything other than work, whereas those discussions can occur in our group.

4.2.2. Writing life history and narrative analysis

This part introduces two strategies of interpreting stories during data analysis.

1. Life history of Han

“Then, this is how things happened to me.” Han started to try to articulate how her environmental view was constructed through her life experiences:

The environment became my concern when I realised, “How value issues are important in human society!” Something like my worldview, which was formed through student movement experiences. After graduation, my main concern as a science teacher was what sort of science I should teach, and how. I happened to know Dr. Kim at the time by chance, and became involved in the STS movement. That’s how things changed and expanded into ‘science, dreaming of values’.

This vignette was initiated by Han’s question rather than mine during the interview. She abruptly asked, “Then, what’s your environmental view?” It was when she relayed episodes related to her action-oriented personality, but she seemed to suspect that’s not what my question – “Have you found your view different from other teachers, or my position is this... kind of resoluteness?”- intended. The above story followed my brief storytelling about why and how I became interested in the environment.

Perhaps this narrative segment best summarises her life stories in relation to environmental education. Indeed, it seems plausible to construct her life history in this way as themes, episodes, and rich life experiences arise in terms of science teaching at school, teachers’ group engaging in STS movement, NGO-related alternative energy education, student movement experiences at university, and personal (and family related) environmental activism. Then, ‘Science, dreaming of values’ – the name of the teachers’ group she’s leading, but also the title of the book published by the group – might be a potential title. This was how I could deal with research focus 1, investigating teachers’ diverse conceptions of environmental education.

***Some keywords and the way she used the words⁵⁷**

⁵⁷ The keywords were derived from what she frequently used. They are the most frequent (and meaningful) words among 554 segments I divided the interview text into (arranging from one sentence to entire paragraph), with ‘the environment(al)’ (doesn’t contain ‘environmental education’) having 76 segments; ‘science’ (doesn’t contain ‘environment’), 57; ‘teacher(s)’, 61; ‘student(s)’, 51; ‘environmental education’, 31; ‘movement’ or ‘progressive’, 18; and ‘value(s)’, 18, segments respectively. Each keyword and its all segments were extracted by the use of ‘filtering’ in the MS Excel program. This method was useful to understand the way she used the keywords.

'the environment(al)': very abstract meaning, not clear definition

- environment-related (educational/personal) activities
- environmental thinking/view, 'pro-environmental'

'The environment'

- school subject, and the teachers who teach this

'science'

- mainly related to 'teaching', teaching knowledge and what she did/does in relation to environment-related activities, earth science, and other science subjects sociology of science, STS, teachers' STS group, how and what to teach, science teacher's responsibility/other science teachers

'environmental education'

- mainly used to reply to my question that includes this word, not frequently mentioned as educational area, but not established together with examples such as nature activities and energy.

'teacher(s)'

- professional identity, reflections and thinking about it herself as (science) teacher and responsibilities what teacher/teaching is for/about, in general teacher vs. academics/NGO people other teachers who are (not) sympathetic to her/her view

'student(s)'

- the pupils she teaches/taught, very concrete episodes, tend to become long teaching and learning activities such as classroom, club, and NGO pupil's response/dispositions/attitude, school education practice and culture (curriculum, exam, etc.), children in our society, difficulties in teaching

'movement' or 'progressivism'

- sympathetic/critical comments of the ideology, student movement, environmental movement/NGO, progressive teachers, teachers' union

'value'

- in relation to what she counts as her worldview or perspective
- science and value, STS, how to teach value, value vs. scientific knowledge (teacher's professionalism), priorities in value in terms of economy, environment, personal dispositions.

This approach assumes the narrator is the 'authentic' voice, and the researcher's role is reduced to

editing and translating stories from the whole interview text. However, the latter is more than a passive role since there is an inevitable involvement when the decision – opting for/out this bit – should be made. Thus the issue here is to ask myself why I choose this narrative segment (because it fits with the research interest or because there is repetition or emphasis by the narrator.). Having considered this deliberately and adequately, the following is a possible outline of Han's life history:

Title: Science, dreaming of values

Should I become a science teacher?

wanted to be a doctor

father's advice

university curriculum

student movement

between a teacher and an activist

taking teaching on board

Reading values in science and acting out

studying STS

action-oriented personality / working style

teaching about the environment in science

ecofeminism / alternative energy

anti - NEIS (National Educational Information System) issue

Teaching science, tricky business

finding a space for STS

being a good teacher can be diverse

I'm a demanding teacher

Environmental education? Only if they want!

studying in graduate programme

environmental education 'business'

NGO's attitude to education

school environmental education

Moving on!

working at high school

want to be more confident

future plans – working at rural school?

How I want to read and write her life history

- Her own way of making sense of environment teaching, with keywords and themes such as

STS, teachers' group, earth science, NGO, teachers and students, etc.

- Her rich experiences and insights into teaching and environment teaching
- Complexities and struggles in making changes
- Coexistence of resoluteness and powerlessness
- Being critical about her own ideas and practices as well as others

What I expect readers to read in life history, in general

- The formation and refinement of environmental consciousness over time (not in strictly 'life long' sense)
- The development of skills and strategies with which to cope with the reality
- Understanding teaching as morality such as (personal and professional) beliefs, values, and perspectives
- The embeddedness of environment teaching in personal context
 - Environmental education as kind of field in the making

Potential effects / usefulness of life history

- Something she wants to do/be, she has done/is doing, 'stories of ee'
- Idiosyncratic story, individual's life and professional strategy under social constraints
- Rich understanding of lived experiences

Issues

- First voice but inevitable word change and editing/my writing style
- How much my inferences are necessary in the text (e.g. added explanation on the Korean context when specific issues arise)
- Length / translation / sub-chapters and titles?
- How might she think about my construction of her life history?

2. Narratives of challenges

Having read and re-read the interview text, my interest moved from topics and themes to narrative characteristics. What stood out in Han's narrative when she attended to the recollection of past experiences was something 'intersecting' or 'overlapping' – between her own experiences and the reflection of them, her opinions / critiques of phenomena, and other people's ideas. Likewise, during the interview, I noticed that she was able to make connections between my questions and other topics and episodes, and this seemed to contribute to providing 'rich' stories. Looking into this intersection enabled me to see changes in her feelings, attitude and voice. I could characterise her stories as 'narratives of challenges'. Indeed, her stories about teaching science and environment were fashioned into the

narrative structure in which her radical, action-oriented position, its encounter with opposition or criticism, and her ambivalent attitude repeatedly emerged.

Episode 1 illustrates this narrative structure:

Episode 1. Teachers' STS group

I: When did you engage in environmental activities outside school?

H: I have been engaged in one teachers' group. It was set up...6, 7 years ago?

I: How was it set up?

H: Initially it was Dr. Kim's idea. We worked together at the previous school before she went to study abroad. Later, she introduced STS movement in Korea. At the time, there were people who devalued it. But my view was, whether it is kind of technique or movement, it seemed very meaningful to do. So, I collaborated with her, publishing several articles on students' responses to STS teaching. Then, through her, I came to work with some people who specialised in sociology of science or philosophy of science at Citizenship Science Centre in NGO. It was when the idea came to her for a Teachers' STS group. Then I assembled people I knew, while she assembled people she knew... Recently we changed the name to, 'Science, dreaming of values'.

I: Ah! I have come across the book title!

H: Yes, that is the one we published. The title isn't inviting, not that promising because it's not so fun. It's not about developing science experiment methods, nor about classroom teaching. It doesn't even look as if it is about science teaching, although we insist it is. But it's not really compulsory for teachers to teach. Even though they want to, to implement it is another matter. I see this approach as vital, and teachers have to take it on board, but it isn't easy to motivate them. The number of our members is around ten to fifteen, and I think it will remain more or less the same in the future. So, I don't see us a very good prospect or something. [Laughing]

The following episodes illustrate how Han's attitudes change over time throughout the whole story.

Narrative structure and style:

Narratives of challenges	People devalued STS, but I thought it meaningful	I don't see us as a very good prospect or something. (Laughing)
	The book title doesn't look as if it is science teaching but we insist it is.	
Narrative structure (Episode 1)	Her position and its collision with others	Ambivalent attitude
	Such violence!	After all, I just accept the difference.
	It is very interesting.	
Narrative style (Episodes 2 and 3)	Critical and moderate voices	Ambivalent attitude

It was noticeable that Han switched her voice between a ‘critical’ one and a ‘moderate’ one. A critical voice appeared when she remarked on her own views and values, and her critiques of discourses and other people’s ideas. In the critical voice, she was convinced, determined, and radical. For example, she recalled an example of traditional environmental education that she regarded as bad (or ‘violent’ in her words), trying to argue for ecological sensitivity as a priority:

Episode 2. School environmental education [critical voice]

At the previous school, once I fought against the school. Our school was one of the “so called” ‘model schools of environmental protection’. But the school took all the trash bins out of the classrooms to reduce garbage, and then distributed plastic bags to pupils to force them to take their own trash home. Such violence! That’s the fallacy of traditional environmental education. I thought it gave only bad impressions of environmental education to pupils. It was such a ‘tighten your belt’ ideology!

However, in the context of the ‘whole story’ of the interview, a moderate voice became dominant, and this was evident as Han recalled how difficult it was to make practical changes, and how different people’s views were. Describing the teachers’ group she was leading, she tried to avoid straightforward critiques of other teachers’ ideologies by using moderate words:

Episode 3-1. Other teachers [moderate voice]

It is very interesting that we’ve never been so keen on debates, examining our own ideologies, never... A funny thing is not one of us has ever studied the sociology of science before... Maybe this is why our team wasn’t spilt and still gets on.

(I: Did the teachers in the group have an interest in sociology of science from the outset?) Well. Hmm... I found very odd that it’s not necessarily the case. The people assembled by Dr. Kim and me. So, hmm... it’s not that they were evaluated or something. Instead, we assembled people who just wanted to study. So, maybe we just needed a learning process as we studied together (rather than evaluating/being critical to each other’s view). [...]

Han talked before of how difficult it was to motivate teachers to participate although she felt that it was very important to study the sociology of science. But in reality, teachers’ views and knowledge varied and the focus of discussion in the group was likely to be on how to teach this knowledge rather than debating critical points arising from differences in points of view. Later she defined ‘evaluating’ as knowing whether the person is ‘progressive’ or not. Thus, it was likely that the teacher who was the member of teachers’ union was regarded (or evaluated) by her as being progressive. Maybe Han wanted to (or did) criticize some people - who were not evaluated as such - of not having profound reflections on why science teachers should study sociology of science. However, her attitude remained rather

ambivalent, with a moderate voice used in her speech.

Often Han faced challenges in making her argument. As her radical view became dressed in a moderate voice, she actually expressed feelings of powerlessness:

Episode 3-2. Other teachers [ambivalence]

Nobody seems to disagree with the idea of environmentalism. When I talked of animal rights, vegetarianism, they usually mumbled. "Yeah, you're right. I see your point."... But here's the thing, Nuclear energy, "it's indispensable, and very safe!" Their voice would get stronger. At the time, it's likely to become a dispute... On that issue, many teachers object to me... After all, I just accept the difference.

To capture Han's ambivalent attitude seems important in understanding her life history as the narratives of challenges. Indeed, the whole story is more about challenges than about 'supports'. However, it is not about 'despairs' or 'abandonment' either. As she described herself as 'action-oriented', it feels as if she will never stop 'doing' and 'acting', whatever it is about (for now her plan is to go to countryside and to teach at a small school for ten years until she can feel confident and free). Thus, such ambivalence can be understood as two coexisting attitudes – being critical and being realistic (or moderate). Such an interpretation may allow for a kind of 'psychological development', that is to say, a personal strategy she developed or learned in order to, or as a result of, cope with challenges through continuous negotiations between the realities and her ideals and beliefs.

This is one method of narrative analysis; interpreting the plot, characters, and the structure of the story (what the story is about), and it is suited for a psychological research agenda in narrative inquiry (Chase, 2005). In addition, this mode of presentation of stories enables the move from a life history, where the narrator's voice is authentic, to a more researcher-centred analytic voice.

3. Developing stories and analyses

How can this life history and narrative analysis give critical insights into discourses of environmental education in Korea? Methodologically, how can empirical study (personal narratives) combine with textual analysis (documentary analysis, discourse analysis, etc.)? Current ideas are these:

1) If more life histories (around five people?) are collected, they can tell:

- the current state of school environmental education in Korea, in terms of the diversity in teachers' understandings and practices. Teachers' stories will tell what Korean teachers want to/ can/ can't

do in teaching about the environment. And this is powerful tool in excavating what is behind these;

- the complexities in identity formation (although it is an elusive concept) in terms of interactions between personal and professional. In Han's life history, STS seems to play a major role in guiding her into a 'different' way of teaching science, while value issues are an overarching concern in her life and teaching. Perhaps other life histories tell us how different teachers encounter, or get a grip on opportunities, and how they struggle to maintain beliefs and values in life and teaching. Readers may have a taste of what it's like to become an environmentally conscious teacher; and
- the cultural and historical context in which individuals are positioned. It will be possible to capture how individuals understand such social changes in both environmental and educational discourse. While in Han's case, political struggle became conspicuous, other people may have different stories.

2) If the stories can be developed into narrative analysis mode, the analysis will be about:

- teachers' strategy in managing to teach about the environment; and
- differences in narratives. Han's narratives of challenges, while others' being narratives of personal growth or anything?

3) If focus group interview is successfully conducted, it will be possible:

- to draw upon official discourse of environmental education arising from teachers' understandings of aims, concepts, and pedagogy (such concepts as 'education about/in/for environment, 'sustainable development', 'pro-environmental behaviour', different perspectives on the environment such as techno-/ecocentric environmentalism, social criticism, eco-feminism);
- to see how environmental education as a school subject is being implemented (given its marginal status); and
- to understand what counts as crucial and practical (view, knowledge, pedagogy) in environmental education.

4.2.3. Background understanding of the environmental issues in Korea

❖ ‘Well-being’ fever (in a newspaper article)

“Live Cool and Well” ... Is it a New Culture or Just a Business? (JANUARY 11, 2004, Donga-ilbo)

To define “well-being” with trendy words, we can say a ‘cool’ healthy culture.

Generally, well-being is known as a culture pursuing a healthy life through harmonizing the mind and body and not being tied down to materialistic values. Not to mention, regarded as an elegant taste or a symbol of wealth. So then, do the common people also think of well-beings as mentioned above? Last December, the Dong-A Ilbo health management team conducted a fact-finding research on well-beings to 774 people using the health examination center of major university hospitals including Samsung Medical Center, Asan Medical Center, Korea University Medical Center, Hanyang University Medical Center, Severance Hospital, Kangnam St. Mary’s Hospital (Catholic University of Korea), Kyunghee Medical Center and Seoul National University Hospital.

Research was done by a one-to-one interview and filling in the questionnaire. Of the total 850 collected questionnaires that were answered, 774 (322 males, 452 females) statistically meaningful answers were analyzed. Well-beings are only a few: “I would gladly sweat at the health center for my health.” “My ordinary life is comfortable and natural.” “I don’t hesitate to buy natural organic food.” These were the general images of well-being that the people thought of.

It turned out that pursuing luxurious brands or extravagant life, or the opposite, living a simple life, all do not associate with well-beings. In short, well-beings are drastic when investing in themselves, but is a group that follow substantiality and not the outer form. There was something interesting from this research. Even though the entire country bustles over the well-being syndrome, there are actually only a few who have well-being. Only 14 percent answered, “I am a well-being.” 45 percent answered that they did not even understand the general idea of well-being or have heard of the word. Experts analyzed that the reason was that the well-being culture was limited to those who had huge interest in health. Considering that the people who had participated in this research are those who often take interest in their health, there is a possibility that this well-being fever is a bit exaggerated.

There was no exception to the well-being culture that the young generation takes in the new culture the best. From this research, 40 percent of those who replied they were well-beings were in their twenties. Following it, the thirties constituted 35 percent, showing that those in their twenties and thirties took up 75 percent of the entire well-beings. The forties had 20 percent, fifties were four percent, and those under their twenties were only two percent.

When analyzed by occupation, the group farthest from well-being were the housewives, at nine percent of the total female well-beings. Altogether, those with professional occupations rated 20 percent, showing the highest percentage, and public officers were second, rating 18 percent. Students accounted for 11 percent. It takes money to well-being: How much do well-beings invest in to maintain their current condition? We asked the monthly cost for well-being. One out of two, approximately 47 percent, answered that they invested “100~500 thousand won.” Following this, 40 percent answered “less than 100 thousand won.” Five percent each answered “50,000 - 1 million won” and “1~2 million won.” Only two percent answered “above 2 million won.”

Being financially stable was most difficult for well-being when maintaining their current condition. On the question asking about the obstacles to well-being, 42 percent replied, "It takes a lot of money." Following in second, 36 percent said that making spare time was difficult. Eighteen percent replied, "There are no suitable facilities," and three percent said, "The looks around me are stinging."

What is the reason why 86 percent of the answers who are "non-well-beings" cannot join the well-being group? Thirty percent replied, "We cannot afford it." Twenty-six percent said, "There is no time to spare," coming in second. These are the same difficulties that well-beings have when maintaining their condition. Twenty-three percent replied, "I am not interested" and 14 percent said, "It does not emotionally match with me."

Well-beings meet at health centers: We asked of the flashing image of well-beings to those who are actually well-beings and those who aren't without singling out. The questionnaire presented 15 items currently considered as the culture of well-beings: health center and exercise, diet, aroma and massage, yoga and meditation, organic food, luxury, simple, composure and naturalness, self-complacency, young culture code, preferring luxury brands, considering mental value important, diligence, sensitivity to health information, and others.

The respondents picked out "health center" and "exercise" (14 percent) as the words most related to well-beings. Following, composure and naturalness (14 percent), organic food (12 percent), self-complacent (10 percent) and considering mental value important (7 percent) were picked.

On the other hand, simple (18 percent), luxury (14 percent) and preferring luxury brands (13 percent) were responded as words not related to well-beings, showing that well-beings and consuming do not have a huge relation. Following, diligence (11 percent), young culture code (8 percent) were replied as not related. Meanwhile, 56 percent respondents said that well-beings are being used commercially. Only 16 percent replied the opposite.

Downloaded and quoted from:

<http://www.toronsil.com/technote6/board.php?board=englishdebate&page=5&sort=hit&command=body&no=115> (accessed 25 October, 2007)

❖ *Cheonggyecheon restoration*

The official story (source: <http://english.seoul.go.kr/cheonggye/>)

The brief history:

"By 1945, when the nation was liberated from the Japanese colonial rules, the Cheonggyecheon was filled up with trash, ground and sand swept from the bare mountains and severely contaminated with wastes from shabby makeshift houses built alongside. After the Korean War (1950-1953), even more people swarmed into Seoul to find their way and make their living and settled down along the stream.

Those living in houses near the stream suffered a lot due to the stench caused by the large amount of wastes flowing into the stream. Thus, the image of Seoul had also been severely affected. It appeared that the handiest way to put an end to the multitude of shabby, makeshift houses and the dirty smell was to cover up the stream with

concrete. Finally, the work to cover it up with concrete started as quickly as possible by August 1958, with the 136m section near Gwangtonggyo completed in 1955 ahead of the remaining sections.

In addition, a 5.6 km-long, 16 m-wide elevated highway extending from Gwanggyo to Majang-dong was completed over the stream in August 1971 after four working years. Thus, all makeshift houses along the stream were demolished, freeing the place for some modern commercial buildings.

A multitude of large and small tool, lighting, shoes, clothes, secondhand book stores were opened one after another along the concrete-covered stream, attracting some endless lines of customers. Everyday there were hundreds of thousands of vehicles passing through the covered stream and the elevated highway. The area eventually became the busiest and noisiest sector in Seoul. No other area in Seoul can reflect the city's history of the past half-century better than the Cheonggyecheon area, though.

By the end of the 1950s, it became a symbol of poverty and slovenliness, being filled up with trash and wastes. During the 1960s and 1970s, it was regarded as an example of successful industrialization and modernization. Then, in the 1980s and 1990s, it came to be regarded as a source of intense traffic, health and environmental issues.

The objectives of the restoration:

- Restoration of a natural environment and enhancement of the quality of life

The heart of the restoration work lies in a clean water flow and in a clean environment for fishes and plants. Besides, two-lane roads were built on each side of the stream. The 22 bridges built across the stream and the paths made on both sides of the stream will help people take a good rest alongside or nearby. The authorities are also planning to expand green areas in the residential areas to 1 million pyeong (= 810 acre) and to widen and to develop access roads to the Hangang.

- Restoration of history and culture

Another purpose for the restoration work was to make people regain the past pride of those living at the heart of the nation's long history and splendid cultures. In that matter, the City of Seoul is making some efforts to excavate and restore historical objects and sites in the Cheonggyecheon area as well as in some other areas of the city. Once successfully done, Seoulites will have good rest areas in the downtown area, while witnessing the nation's long culture and splendid cultures through such objects and sites.

- Revitalization of the economy

Along with the restoration work for the stream, the City of Seoul is planning to turn the city into a business hub in the Northeast Asia by offering some conditions attracting foreign businesses, with a full use of its geographically advantageous position, with 43 cities with over 1 million people located within three hours' flight.

Examples of critical voice in the newspaper

1. Officials, street vendors clash over Cheonggye project

Seoul City officials and street vendors clashed in Cheonggye, central Seoul, yesterday as the marketers set fire to a heap of waste materials and set up barricades in protest against the government forcibly closing their street stalls in the area, which has been earmarked as part of a city remodeling project. A total of 3,500 officials and city-hired removal workers began removing some 530 street stalls early in the morning to clear the way for restoring Cheonggye Stream that flowed through the heart of Seoul until it was covered four decades ago. To block the government move, more than 1,300 street vendors held a sit-in rally and wielded metal pipes, criticizing the government for lacking measures to secure their livelihood during the restoration project slated to end in September 2005.

Despite the resistance, Seoul City completed the removal of the street stalls around lunchtime after mobilizing excavators and dump trucks. No major injuries were reported during the forced evacuation, but 250 marketers continued protesting until late into the night, hurling liquor bottles and erecting roadblocks to obstruct workers. Police stationed 4,500 personnel to restore order. The confrontation between the Seoul Metropolitan Government and the Association of Merchants has continued since the city government embarked on the restoration project, aimed at developing the capital into a more environmentally friendly city, on July 1. The vendors have refused the government's demand that they relocate to other designated zones, calling instead for the street to be named a tourist area where they could continue their business activities even after the restoration project is completed.

The two sides attempted reopening their negotiations yesterday, but found them quickly ruptured. On Friday night, 20 residents at an urban development area in Sangdo-dong, southern Seoul, engaged in a physical confrontation with workers, who were trying to demolish their houses to build a new apartment complex. Out of the 250 families who were originally staying in the area, 20 have refused to leave and staged demonstrations, calling on the government to give them possession of a unit in the new complex. During the latest clash, some of the residents hurled firebombs at the workers, and held 11 of them hostage before releasing them in return for the government's promise to withdraw police from the area."

(Available at: <http://www.kinds.or.kr/>; accessed 4 March, 2008)

2. [Editorial] Virtues and Flaws of New Cheonggye Stream

The Hankyoreh, 1 October 2005.

The opening ceremony of the Cheonggye Stream starts today, but fish, insects and birds are already swarming in the waterway. Egrets, mallards, Chinese minnows, carp, catfish, children and adults mix together as if friends. It's been 44 years since the Cheonggye Stream was covered in 1961. The heroes of this story are the scholars, artists and civic groups who dreamed of the restoration of the Cheonggye Stream and pushed it, the *Hankyoreh*, which informed the world of their hopes, and the Seoul City officials who brought those dreams into

fruition. No less virtuous were the Seoul citizens who quietly endured while they suffered restrictions on their livelihoods following the start of construction.

The capping of the Cheonggye Stream and the elevated highway were symbols of the predatory modernization, which strove for only competition, speed and efficiency. The clothes factories that were in its shadow were symbols of the value of life, namely the trampling of human rights, justice, culture and nature for economic efficiency. Now with the restoration of the Cheonggye Stream the forgotten history of life has been revived and our friends of nature that were forced out have returned. The restoration of the stream has become an opportunity to do away with the sorcery of the predatory modernization and take another look at the value of life.

Accordingly, revealing the flaws of the new Cheonggye Stream is just as important as praising its virtues. Firstly is the half-half manner in which it was restored. The stream has been filled with water from the Han River, but in fact, it's closer to an artificial waterway. The tributaries that used to bring water into the Cheonggye Stream from the countless ravines of Mt. Bukak, Mt. Inwang, Mt. Gaeun and Mt. Nam are still buried underground. Because the construction prioritized results, the restoration of cultural properties was sloppy or the original forms damaged. A greenbelt was not secured around the stream, and it could not revive the benefits of a natural stream. If the surrounding areas are densely developed, the Cheonggye Stream will not become a friend of the people, but a trinket of capital and politics.

The new Cheonggye Stream is the start of change. Let's resolve things by keeping in mind that Paris spent three years gathering the opinions of citizens and scholars to restore a tributary of the Seine River to its natural state."

(Available at: <http://www.hani.co.kr/kisa/section-008002000/2005/10/008002000200510010148600.html>; accessed 4 March, 2008)

❖ *Stem-cell scandal*

International news: Korea's national shock at scandal

BBC NEWS, 13 January 2006, by Charles Scanlon, BBC News, Seoul

"It felt like a quasi-religious meeting."

A thousand people gathered for a candlelit vigil on an icy night in central Seoul - a show of solidarity with the cloning scientist that they still call the "pride of Korea". Dr Hwang Woo-suk had been exposed as a fraud by his colleagues at Seoul National University. His two landmark papers on cloned embryonic stem cells were found to have been fabricated. But Dr Hwang can still count on a hard-core of supporters and many more who are reluctant to accept the downfall of a national icon. "Faking the research paper was not so important," said Lee Young-sil, who came home from Japan to show her faith in the scientist.

SCANDAL TIMELINE

Feb 2004

Hwang Woo-suk's team declare they have created 30 cloned human embryos and extracted stem cells

May 2005 Team says it has made stem cell lines from skin cells of 11 people

Nov 2005 Hwang apologises for using eggs from his own researchers

15 Dec 2005 A colleague claims stem cell research was faked

23 Dec 2005 Academic panel finds results of May 2005 research were fabricated

10 Jan 2006 Panel finds 2004 work was also faked

"The important thing is that he made important progress in his research. Bringing down a scholar like this is not helping the country." Dr Hwang's cult-like following was fuelled by nationalism, and has proved remarkably resilient despite evidence that he fabricated research and then lied about it.

The government also played a key role in the scientist's rise to glory - seeing political advantage in promoting him as the face of the future. He was held up as a harbinger of a high-tech future for a country nervous about competition from China in traditional manufacturing. "Government policies to support and finance Hwang's work merged with nationalism and patriotism to create a quasi-fascist environment that suppressed criticism," said political scientist Choi Jang-jip.

Hwang Woo-suk is still fighting to redeem his reputation with a once adoring public. After weeks in seclusion, he apologised for the fabrications in his papers but claimed he had been duped by fellow researchers. He continues to insist he does have the core technology to clone human embryos and he appealed to patriotic sentiment to be given a second chance to prove it.

But even as he spoke, his status as national champion and scientific superstar was rapidly deflating. "The only thing that I could see was the hope South Korea could stand high at the top of the world" The government stripped him of his unique title of Supreme Scientist; stamps featuring the celebrated cloner were quietly withdrawn; and school text books extolling his virtues are being revised.

Biographies of the 53-year-old veterinarian were also disappearing from Seoul bookshops - there were 16 at last count, including children's comics and hagiographies portraying the scientist as a role model for Korean children.

National pride

Hwang Woo-suk's motives have baffled colleagues and scientists around the world. He was an acknowledged leader in his field of animal cloning. The Afghan hound "Snuppy" has been verified as the world's first cloned dog. In his public statements, Dr Hwang says he was driven by ambition and national pride. "We became crazy for our work and were blind to everything else. The only thing that I could see was the hope South Korea could stand high at the top of the world," he said in his latest encounter with the media.

The truth remains obscured by conflicting claims and allegations. Junior researchers say they were ordered to fabricate results. Dr Hwang insists they deceived him and he has called on prosecutors to investigate his allegation that stem cell lines were switched. Increasingly, the government's role in the scandal is coming under the spotlight.

The government identified the biotechnical field as an industry of the future and poured in investment and support, said Lee Jae-myung of the liberal pressure group People's Solidarity for Participatory Democracy. "The government bragged about Dr Hwang's results as if they were its own, but they failed to check the validity of any of the supposed achievements. The government has to take responsibility for this." Ministries offered their full support to Dr Hwang's team at Seoul National University when allegations of wrongdoing first surfaced.

A wave of nationalist emotion initially helped to silence those raising questions. Now, even in top government circles, some are still prepared to speak out for the disgraced scientist. "Dr Hwang asked for forgiveness, so people should be more generous and give him an opportunity to rise again," said Chung Dong-young, a recent cabinet member and now a leading presidential contender from the ruling party.

Dr Hwang's fall from grace has stunned scientists around the world, who thought he had made a revolutionary breakthrough. The shock and bafflement in his own country is even more acute; but even now some Koreans are reluctant to accept their hero was a fraud.

(Available at: <http://news.bbc.co.uk/go/pr/fr/-/1/hi/world/asia-pacific/4608838.stm>; accessed 4, March 2008)

4.3. Methods for developing ‘beyond personal narratives’

4.3.1. Discussions on teacher’s stories

The context

In January 2007, I drafted the earlier version of five teachers’ stories that eventually developed into the form in the box in 5.2. To broaden the understanding of the stories, as something beyond my own frame of interpretation, I decided to invite groups of university students to the discussion on teacher stories. The main purposes of the discussion were:

- To ascertain the accuracy of the text and translation by contextualising the meanings (whether people see things the way I do);
- To widen the ways of reading the stories by encouraging them to read in their own ways.

With this idea in mind, given my geographical circumstance in Bath, two different groups at the University of Bath were chosen in different contexts.

A discussion with two Korean undergraduate students

The background:

The Korean students’ views and understandings of teacher’s stories were expected to bring the ordinary understandings of teacher’s work and responsibility in the Korean culture that are beyond teachers’ and researcher’s perspectives. Distinctively, one of the students had study experience in New Zealand for three years, which provided a good context for discussing critically and reflectively on our culture of education.

The process:

I invited two students who were studying at undergraduate level via the Korean Society. I had known one of the students but not very well, therefore we were able to maintain our relationship as more like a researcher-discussant type. I also paid £30 for each, in order to reassure them that the discussion was part of the research project, and therefore, to be prepared for active participation. Before the discussion, we convened for the introduction, and I explained briefly about the purpose of the discussion. I gave out two full interview scripts (With anonymous names A and B), and the draft of short stories developed from the scripts so that they also could examine the translation. We agreed to meet again after one week with preparation for the discussion on:

Educational views of two teachers

- Education/ science education/ environmental education – and their relationships
- Educational potentials and critiques
- Comparison/contrast between two stories

Understanding of environmental education

- Your own thinking, experience, and stereotypes and images
- Critique of two teachers' environmental education teaching approaches
- Potential in the implementation
- The relationship between your schooling experiences and EE

Reflecting on your own schooling experiences

- Memories of the teachers (good, bad, etc.)
- Your own definition of good teacher
- The benefits of public education, and the limit
- Critique of our educational system
- Thinking about quality education

We met again for the discussion (7 February 2007). One of the students brought notes in which he recorded his thinking as it occurred during the reading. The two students were well-prepared for the discussion, and the interaction among us was well-managed. My role was as a facilitator in general, and our discussion began with the general impressions and thoughts, rather than following through the list of the above themes, but still covering them. The two-hour long discussion was recorded and transcribed in full scripts, and remained in Korean.

The discussion with three fellow research students

The background:

This time the students' views and understandings were expected to bring some theoretical ideas about environmental education and educational research in general. Given their national backgrounds (two from European countries, one from other Asian country), cultural difference could be one topic of the discussion.

The process:

To this group, I gave out the earlier version of five teachers' stories without further background information with the following suggestion for reading attached:

- Understanding teachers' stories of environmental education: How do teachers tell a story when they are encouraged to talk about their environment-related experiences?
- Here are five science teachers' stories about environmental education. These are selective narrative segments, thus the researcher's own interpretative process became involved in developing these stories. Through the interview process and subsequent interpretations, the stories were constructed to focus on teachers' understandings of the self and identity as a person and teacher, and how their environment-related experiences and perspectives were intertwined with these understandings. Thus, the stories are not exhaustive, but selective and unfinished. The components of environmental education, for example are not necessarily addressed in each story.
- Having invited you to read these stories, I request you to consider the following aspects. Please write down some words for each story on separate sheets.
- If you see the stories as a genre of literary work rather than academic research, what are three words (or more) that describe the first impressions you've got about each story? For example, you think,
 - This story is...
 - This teacher is, and
 - What did you find unexpected or less clear in understanding the teachers' 'environmental education'?
- Considering potential comparisons and contrasts between five science teachers, can you identify some characteristics which are distinct to each story? Also, related to this, how much do you sympathise with the titles given?

I received the responses from all three students. The below box was from one of them:

- General impressions
 - The idea of scientific literacy pops up in several stories – explicitly or implicitly and the importance of the relationship/links between society and sciences (the environment) is highlighted again and again

- This might well illustrate the socially critical flavour that for me runs through these stories
- There is an overall sensitivity that gaining knowledge (information) is important in order to develop progress be it personally (e.g. the mentioning of the need to read widely or the intended master's programmes) or on other levels
- Typical topics are consumerism and alternative energies, why so? Are these the most popular in the media?
- What is meant by sociology?
- Young (I think this is a male)
 - My title would be 'knowledge is power' (is this an English saying too? I really don't know)
 - This story is about being a different (better?) teacher, being holistic and interesting
 - There is a strong feeling of inadequacy (or still having a long way to go) especially in terms of gaining knowledge (how does this relate to knowledge society developments?) but also regarding building up a value system and gaining experiences (persistent learning process; collaborative learning)
 - Environmental education + scientific literacy?
- June
 - June is interesting as I feel there are two models/perspectives mixed up on the one hand she is arguing that EE is about attitudes (and perhaps less knowledge (see previous teacher!) and that pupils need to change attitudes towards the environment, on the other hand the behaviour does not count that much but rather the (socially-critical) thinking again?
 - Critical thinking (and critical debate) prioritises his remark about the rational communication process - sounds fairly Habermas
 - I feel strange about the profession thing
 - Quality of education and EE, how do both go together? That's not so clear for me here
 - NGOs as a possibility to realize one's vision after the (restricting) school teacher career?
 - Interesting his perception of working is rather individualistic yet he is dismissing selfishness?
 - Sociology enables us to reflect on a vision/future perspective
 - There is much more satisfaction as with Young
 - I like her perspective!
- Lee

- Restricting school structures and EE, what roles for NGOs?
- Strong conviction that's almost a bit religious to me
- Perhaps the story that tells me the least?
- This teacher is the least committed to his profession? So he's passionate about environmentalism rather than about teaching or both?
- Han
 - Hmm Han seems fairly radical and somewhat close to B when arguing for getting back to the past - Bowers (?)
 - I am not sure whether I do understand the STS role relevance
- Kim
 - For this I would give the title 'evolution not revolution' I mean the way how to change things are not radical for him but a slow process
 - Then this teacher is a critical realist?
 - Concept of scientific literacy explicit (see also first teacher)
 - Environmentalism as bridging element between
 - In a way this is an encouraging (he calls it empowering) perspective as it does not overwhelm, but contrast this with Han who at times seems to be fairly dark green
 - Unclear to me why this should be a hidden curriculum

As evidenced here, the comments were a mixture of questions for clarification and interpretation, and some theoretical concepts. I invited the students to the group discussion. Because of personal circumstances one student could not participate in the further group discussion, but I still could manage to meet her to receive her comments and to have a brief discussion. With the other two students, the discussion began with going through each of the teacher's stories, one by one, sharing how they understood the stories. Compared to the discussion with the undergraduates, this time I was more actively engaged in the discussion in clarifying the overall purpose of developing this form of the stories, as well as providing more background information and contexts about five teachers. As written responses were already collected, note-taking rather than tape-recording seemed more appropriate. The discussion lasted one hour.

My reflection on the two discussions

Because the purpose of the discussions was largely driven by the need for alternative perspectives in

reading teacher's stories, other than researcher herself, the design of the discussion was not strictly informed by qualitative interview methods. Instead, my intention was to share my ideas and understandings of the teacher's stories, and the research project in general, as a complementary approach to the main method of narrative analysis. Therefore, the use of the themes and contents that emerged from the discussion was limited in the discussion in Chapter 5. Overall, learning from other perspectives and ways of understanding was instructive in developing the analytic angles for the chapters that followed.