As more attention is devoted to the increasing and complex socio-ecological issues facing the planet, new insights and new ways of thinking are being sought about the learning and agency of children and adults in relation to these environmental concerns. The contributors to this book address the critically important dual challenge of making environmental education engaging while engaging individuals, institutions and communities. Rather than treating students and citizens as passive recipients of other people’s knowledge, the book highlights the importance of engaging learners as active agents in thinking about and constructing a more sustainable and equitable quality of life. The case studies emphasize socio-cultural approaches to environmental learning within and outside formal education in a diverse range of international contexts, including Canada, Denmark, Korea, the Netherlands, South Africa, Sweden, the United Kingdom and the United States. The authors not only illuminate the challenges and complexity of engaging youth and adults in meaningful learning, as well as informed action, on complex environmental issues, but also document and offer important insights into promising ways in which these challenges might be addressed. In addition to the many stimulating ideas and strategies for building the learning capacities of individuals and organizations for creating ecologically sustainable communities and societies, further important questions are raised that educators, policymakers and researchers might consider.
Engaging Environmental Education:
Learning, Culture and Agency
Engaging Environmental Education: Learning, Culture and Agency

Edited by

Robert B. Stevenson
James Cook University, Cairns, Australia

Justin Dillon
King’s College London, UK

SENSE PUBLISHERS
ROTTERDAM/BOSTON/TAIPEI
# TABLE OF CONTENTS

## INTRODUCTION
1. Introduction to Issues in Learning, Culture and Agency in Environmental Education
   Robert Stevenson and Justin Dillon

## LEARNING AND AGENCY IN FORMAL EDUCATION CONTEXTS
2. Exploring Student Learning and Challenges in Formal Environmental Education
   Mark Rickinson and Cecilia Lundholm

3. Rainbow Warriors: The Unfolding of Agency in Early Adolescents’ Environmental Involvement
   Natasha Blanchet-Cohen

## LEARNING AND AGENCY IN COMMUNITY CONTEXTS
4. Social Learning in Action: A Reconstruction of an Urban Community Moving Towards Sustainability
   Arjen Wals and Leonore Noordhuy

5. Synergy of the Commons: Co-facilitated Learning and Collective Action
   Charlotte Clark

## LEARNING AND AGENCY IN WORKPLACE AND INFORMAL CONTEXTS
6. If the Public knew better, they would Act better? The Pervasive Power of the Myth of the Ignorant Public
   Elin Kelsey and Justin Dillon

7. Learning and Participation in Developmental Projects Directed Towards Sustainable Development in Conference Centres
   Jeppe Læssøe and Monica Carlsson

## LEARNING AND AGENCY IN A MEDIA CULTURE
8. The Role and Influence of News Media on Public Understanding of Environmental Issues
   Martin Storksdieck and Cathlyn Stylinski
TABLE OF CONTENTS

9. Popular Media, Intersubjective Learning and Cultural Production.................. 147
   Marcia McKenzie, Constance Russell, Leesa Fawcett and Nora Timmerman

LEARNING RESEARCH AND RESEARCH AS LEARNING

10. Understanding others, Understanding Ourselves: Engaging in
    Constructive Dialogue about Process in Doctoral Study in
    (Environmental) Education ................................................................. 167
    Jutta Nikel, Kelly Teamey, Se-Young Hwang, Benjamin Alberto
    Pozos-Hernandez, With Alan Reid and Paul Hart

11. New Possibilities for Mediation in Society: How is Environmental Education
    Research Responding? ................................................................. 199
    Rob O’Donoghue and Heila Lotz-Sisitka

CONCLUSION

12. Environmental Learning and Agency in Diverse Educational and
    Cultural Contexts................................................................. 219
    Robert Stevenson with Carolyn Stirling

Biographies .......................................................................................................... 239

Index .................................................................................................................... 245
INTRODUCTION
ROBERT STEVENSON AND JUSTIN DILLON

1. INTRODUCTION TO ISSUES IN LEARNING, CULTURE AND AGENCY IN ENVIRONMENTAL EDUCATION

INTRODUCTION

The idea for this book emerged from a symposium at the Annual Meeting of the American Educational Research Association (AERA) in San Francisco in 2007. The title of the symposium was ‘International Perspectives on Environmental Learning, Participation and Agency’. Not only were we, as discussants at that symposium, impressed by the quality of the papers presented, but we noted a common and important theme that was highly consistent with the perspectives on learning and learners embedded in the international goals and discourse of environmental education (EE) and education for sustainable development (ESD).

That theme, and the rationale for this book, emphasizes the importance of engaging learners as active agents in thinking about and constructing knowledge about the need for and the ways of developing a more sustainable and equitable quality of life on a global scale. Rather than treating students and adults as passive recipients of other people’s knowledge, environmental learning and action are viewed as proceeding hand-in-hand and are viewed as holistic, collaborative, and democratically participative. The chapters in this book are intended to examine efforts - in formal, non-formal and informal educational settings in a wide range of international contexts - to create environmental learning that matches this rhetoric.

The title of this book is intended to reflect the dual challenge of the need for individuals, institutions and communities to engage with environmental education and for environmental education and learning itself to be engaging. The subtitle represents our recognition, as we read the first drafts of chapters that came in and with the benefit of hindsight, that an additional important theme was evident, namely the role of culture. Participation is still an important dimension of the book, as readers will discover for themselves, but the impact and effect of culture on learning and agency seems, to us at least, to be an even more fundamental theme.

We have tried to highlight the value and importance of culture by organising the chapters into pairs according to their context. So, for example, the first pair of chapters focuses on learning and agency in formal education contexts whereas the next are set in the contexts of communities. Within each pair, we hope that there will be sufficient contrast to enable readers to see the value of both perspectives and sufficient overlap to justify them being put in tandem.

© 2010 Sense Publishers. All rights reserved.
In collections such as this one, the job of the editors is multi-faceted. The first task is to recognise the potential for a collection of contributions to add something to colleagues’ work beyond cataloguing related studies. The idea to put together this book emerged within a very short time after the AERA symposium. However, on reflection, we decided that to tell a/the whole story, we should invite more contributors to add their perspectives and wisdom.

HOW THE BOOK IS ORGANISED

The book has five major sections with each section containing two chapters, as well as a concluding chapter.

Learning and Agency in Formal Education Contexts

In ‘Exploring student learning and challenges in formal environmental education’, Mark Rickinson and Cecilia Lundholm report on findings from two studies that focused specifically on learners’ experiences of and responses to environmental curricula. The first study focused on students’ learning within environmental geography lessons in three English secondary schools (Rickinson, 1999a; 1999b). The other looked at Swedish university students’ learning about environmental issues within undergraduate engineering and biology (Lundholm, 2003; 2004a; 2004b). Through an integration of key aspects of these two studies’ findings, this chapter seeks to highlight the complexity of the learning experience within formal environmental education and to draw attention to the need for improved research-based understandings of environmental learning processes. The authors present an integration of the studies’ findings in terms of four kinds of learning challenges experienced by students in environmental education courses. The chapter ends by considering emerging issues for environmental education practice and research. Four emerging issues for research on environmental learners and learning are identified, but most importantly, the authors conclude that the major implication of their two empirical studies for environmental education theory and practice is the need to treat learners as active agents rather than passive recipients of environmental learning.

In ‘Rainbow warriors: The unfolding of agency in early adolescents’ environmental involvement’ Natasha Blanchet-Cohen explores the nature of environmental agency of 10–13 year old children from many diverse cultures around the world who are involved in extra- or co-curricular environmental activities. Her study reveals that there are multiple ways in which these children engage with the environment and six forms through which they express their environmental agency are identified. Blanchet-Cohen observes that the way they position themselves in relation to environmental problems suggests they are “ready and open to engage in the complexity of environmental issues.” Thus, she argues that teachers should embrace rather than avoid complexity. The data from her study offer an important counter to teachers’ claims, reported in a number of studies, that they avoid discussing environmental issues in their classrooms because of their concern that it will create a sense of despair in children (Cross, 1998; Hicks, 2002, 1998).
Learning and Agency in Community Contexts

In ‘Civic engagement in sustainability: The (trans)formation of an urban community’, Arjen Wals and Leonore Noorduyn reconstruct the making of a ‘sustainable’ neighborhood as a social learning process of civic engagement in sustainability. This reconstruction is based on a study carried out five years after the initiators found a strong enough support base to start the creation of Eva-Lanxmeer in the Dutch town of Culemborg (Noorduyn and Wals, 2003). As the chapter progresses the authors increasingly mirror the outcomes of this study with recent thinking on social learning in the context of sustainability (Wals, 2007). First, the unique features of the neighborhood are presented, and then they focus in on the process of interaction that took place when the first people had moved in and collaboratively had to design the community garden that forms the heart of the neighborhood. Finally, some key principles or stepping-stones are drawn from the Culemborg experience that might be useful elsewhere. Perhaps the most notable of which is the precautionary recommendation that all those involved should be informed of the uncertainty and risks involved in participating in an interactive process of civic engagement in sustainability.

In ‘Peer mediated environmental learning’, Charlotte Clark draws on her doctoral work to look at the process by which voluntary collective actions form in communities. Clark’s research described and characterized the formative process of learning and collective action in one U.S. community with a focus on issues with environmental implications. Clark followed the community’s process of developing a policy on whether or not to allow domestic cats to roam freely outdoors (where they can prey on native wildlife). This narrative illustrates (a) the process by which a collective action agreement was formed, (b) the challenges faced during its formulation, (c) the potential changes to learning and behaviour that may have resulted within the community during its formulation, and (d) the corollary issues that proceed such a policy agreement, such as the need to orient newcomers, the need to document and reinforce information for all those to whom the policy applies, and the realization that consensus on a policy does not necessarily mean consensus on action.

Learning and Agency in Workplace and Informal Contexts

In ‘If the public knew better, they would act better? The pervasive power of the myth of the ignorant public’, Elin Kelsey and Justin Dillon argue that museums, aquariums, science centres, zoos and other informal science institutions (ISIs) are increasingly committed to engaging the public in issues connected to environmental conservation and sustainability. Although ISIs around the world may hold different views about what information the public should possess, they appear to share the belief that ‘if the public knew better, they would act better’. They operate within a common discourse about the power of education to transmit information from those who are knowledgeable to those who are not (Kelsey, 2001). Kelsey and Dillon explore the implications of this particular discourse on environmental learning, participation and agency within informal science institutions.
More specifically, they examine a case study of conversational learning between guests (visitors) and volunteer guides in the galleries of a major US aquarium. This is a particularly timely topic, as the interaction between ISIs and the public has undergone significant change in the past decade. Throughout the 1980s and 1990s, environmental public participation programs operated in a type of ‘decide-announce-defend’ mode based on a ‘one way’ transfer of information from experts to the public (Duffield Hamilton & Wills-Toker, 2006). Such programs echoed the Public Understanding of Science (PUS) rhetoric, with its tacit assumption of public ignorance and its adherence to a deficit model (Lehr et al., 2007).

In ‘Participatory approaches to workplace learning for sustainable development in the hotel industry’, Jeppe Laesoe and Monica Carlsson examine participatory learning projects on sustainable development at three conference centres in Denmark. The focal point of the chapter is the shaping of, and experiences with, employee involvement related to generating energy savings and addressing other environmental issues at these conference centres. The authors discuss examples of learning and participation in relation to sustainable development and subsequently identify potentials, constraints and dilemmas that influence the process of participatory learning. After a brief introduction to the topic and the concepts of participation and sustainable development, the authors present four thematic analyses: approaches to participation, power and participatory learning, key elements and concerns in sustainable development, and approaches to sustainable development. In particular, they describe a number of conflicts that illuminate the persistent role of power even in participatory processes. The chapter concludes with a discussion and an epilogue on educational research in the public interest.

Learning and Agency in a Media Culture

In ‘The role and influence of mass media on learning about environmental issues’, Martin Storksdieck and Cathlyn Stylinski examine the public’s ability to respond to environmental challenges or contribute to current science debates. They note that the testing of “public knowledge” or “public understanding” by a set of multiple-choice questions has been likened to a “deficit model” of knowledge and understanding since it does not allow an individuals to express what that they do know, and it does not provide a learning context (for example, Falk, Storksdieck & Dierking, 2007). The alternative asset-based model of knowledge and understanding (for example, Falk et al., 2007) suggests that much can be learned in adult life through informal, or free-choice, learning and that tests of what an individual knows or understands should be tied to the way we construct our knowledge and understanding outside of formal schooling. Free-choice learning is the basis for this knowledge construction; it is voluntary, non-assessed, self-directed and under the control of the learner. It is based on an individual’s own interest and motivation and builds on his/her prior knowledge. It occurs wherever a person encounters information: in a conversation with others, during a museum visit, and while watching TV, reading the newspaper or surfing the Internet. We know little about what people learn from these sources or the degree to which this information is corrects or enforces misconceptions.
Various studies indicate that news media plays an important part in this type of learning, especially with regard to science and the environment (for example, National Science Board, 2008; Falk et al., 2007; European Commission, 2001). However, few authors have attempted to determine the direct influence of the news media on learning about environmental topics and issues. Storksdeick and Stylinski try to indirectly assess environmental learning from the news media by examining the way in which environmental stories enter the news (including the forces that shape how they are reported) and then relating this reporting to national surveys and case studies of public understanding of environmental issues.

In “Popular media, intersubjective learning and cultural production,” Marcia McKenzie, Connie Russell, Leesa Fawcett and Nora Timmerman explore a diverse range of media-based examples of pedagogical practices for engaging students in socio-ecological learning. They argue that engagement with media can involve pre-existing artifacts, products in creation, and/or interactive spaces. Examples or forms of media that they examine include “fiction and non-fiction, zines and comics, photography and visual art, film and documentaries, various web-based fora, and a range of other forms that cross-over or join these and other genres” (p. 147) These examples are presented within a framework which treats “engagements with media as intersubjective experiences that involve both the sensory and the cognitive, and suggest that a collective context can support or intensify this learning” (p. 147).

Learning Research and Research as Learning

In ‘Understanding others, understanding ourselves: Engaging in constructive dialogue about process in doctoral study in environmental education’, Jutta Nikel, Kelly Teamey, Seyoung Hwang, Benjamin Alberto Pozos-Hernandez with Alan Reid and Paul Hart attempt to stimulate debate about the processes and effects of undertaking a doctoral study, and being a doctoral student in this field. This chapter is based on a collaborative thinking and writing process, rooted in a common interest to promote critical and reflexive dialogues amongst doctoral students and their supervisors about understandings and experiences of carrying out doctoral work. Key to their exploration is the importance and opportunity of engaging in a constructive interpretive dialogue about process whilst focusing simultaneously on various personal and academic experiences at different stages during those selfsame processes.

Following an introduction to the academic context and research and debate in the area of doctoral studies in Higher Education, the authors propose three heuristics. These heuristics generate different reflections into the multitude and diversity of doctoral research experiences within and across personal, institutional, cultural, academic and discursive contexts and boundaries. The heuristics have been developed and revised in the course of reading literature and from abstracting shared and diverse elements and notions from their own stories and discussions. They then each share their own story to illustrate their points.
surrounding the importance of interrogating and problematising the doctoral process, illuminating and fleshing out complexities of identity, agency, power relations and career progression associated with doctoral research. As members of the research community, their ongoing engagement with the current discourses and practices of the field of environmental education research and converging fields related to environmental education have been shaped and continue to be informed by mundane, transformative, and often painful learning experiences and encounters during the doctoral process. While the chapter title suggests ‘understanding others’ and ‘understanding ourselves’ as important constituents to supervisory discussions or conference interactions, both are understood as important processes servicing additionally wider goals: those of academic progression, professional growth, and progress in the field and balancing process and product within discussions of doctoral studies.

In ‘Researchers as learners: Participatory approaches to researching environmental learning’, Rob O’Donoghue and Heila Lotz-Sisitka propose attending to the ways in which environmental education research might engage with new forms of, for example, mediation structure and agency, culture and power, and experience and rationalization. They begin by exploring how a cultural turn in research is creating a stronger focus on literacies and agency within socio-historical contexts which has been accompanied by the emergence of educational research for the public good. They further note a new form or genre of educational research which they speculate may herald novel manifestations of reflexive mediation in the context of post-colonial Africa. This leads the authors to advocate, as a logical extension, the inclusion of local participants as researchers and to introduce the concept of research-as-pedagogy as embracing these new forms and genre.

Conclusion

In the concluding chapter, ‘Environmental learning and agency in diverse educational and cultural contexts’, Bob Stevenson begins with an overview of different conceptions and theories of learning before relating them to the particular context and challenges of environmental learning. A process of critical inquiry is identified and examined as a central learning process of EE/ESD/EfS, while real or authentic environmental issues are treated as the substantive content. A tripartite framework for critical inquiry of the dialogical, the dialectic and the deliberate (Sirotnik, 1991) is analysed, along with the need for deep reflection on one’s own experiences, assumptions, beliefs and values, as well as on the contextual factors that shape ideas, values and practices, concerning human-environment relationships. Besides critical inquiry and reflection, imagination and action are discussed as necessary components of environmental learning: imagination to generate possibilities for creating more sustainable socio-ecological practices; and action to ameliorate current environmental concerns. The need for developing the capacity for appropriate and effective action raises the issue of learner agency which is framed as involving the three distinct forms of reflective, relational and transformative agency. Finally,
in the last section of the chapter, Carolyn Stirling, examines the important role of research in learning and knowledge creation and how learning to research is a personal, professional and political project in complex and often culturally challenging contexts.

We hope that the following case studies offer significant insights into the challenges and complexity of engaging youth and adults in meaningful learning about and informed action on environmental issues, and most importantly, suggest ways in which these challenges might be addressed. Of course, we expect that they also will raise further questions for researchers, policymakers and practitioners. Beyond posing such questions, however, the success of this book might best be determined by the extent to which the contributing authors stimulate readers’ ideas and actions for building the learning capacities of individuals and organizations for creating ecologically (and economically and culturally) sustainable communities and societies.

REFERENCES


Robert B. Stevenson
The Cairns Institute and School of Education
James Cook University, Australia

Justin Dillon
Science and Technology Education Group,
King’s College London, UK
LEARNING AND AGENCY IN FORMAL EDUCATION CONTEXTS
MARK RICKINSON AND CECILIA LUNDHOLM

2. EXPLORING STUDENT LEARNING AND CHALLENGES IN FORMAL ENVIRONMENTAL EDUCATION

INTRODUCTION

There is growing recognition for the significance of learning within debates about sustainable development. The United Nations has proclaimed 2005–2014 as the Decade of Education for Sustainable Development with the overall goal of ‘integrating the principles, values and practices of sustainable development into all aspects of education and learning’ (UNSECO, 2005). In their book entitled Sustainable Development and Learning, Scott & Gough (2003, p. xiv) argue that ‘there will be no sustainable development where learning is not happening’. Their view is that ‘it is not enough to say that sustainable development and learning need to go hand in hand’; rather sustainable development itself needs to be understood as a learning process (p. xiv). Along similar lines, Sterling’s ideas about Sustainable Education work from the basis that ‘the difference between a sustainable or a chaotic future is learning’ (2001, p. 10).

Recent reviews of research in environmental education, however, make clear that insufficient attention has been given to questions of learners and learning (Hart & Nolan, 1999; Rickinson, 2001; 2006). For much of the last decade, there have been few investigations into what Scott and Gough (2003) describe as ‘learning which accrues from an engagement with the environment or environmental ideas’ (p. 14). During the period 1993–1999, for example, there were many studies investigating characteristics of school students (e.g., what kinds of environmental attitudes or knowledge they have) but few exploring the process or outcomes of their environmental learning. In particular, there has been a tendency to overlook the process aspects of environmental education so that there is ‘a marked predominance of evidence on learning outcomes, but very little about learning processes’ (Rickinson, 2001, p. 216).

In the light of this situation, this chapter reports findings from two studies that focused specifically on learners’ experiences of and responses to environmental curricula. The first focused on students’ learning within environmental geography lessons in three English secondary schools (Rickinson, 1999a; 1999b). The other looked at Swedish university students’ learning about environmental issues within undergraduate engineering and biology (Lundholm, 2003; 2004a; 2004b). Through an integration of key aspects of these two studies’ findings, this chapter seeks to
highlight the complexity of the learning experience within formal environmental education and to draw attention to the need for improved research-based understandings of environmental learning processes.

The chapter begins with an outline of the focus and methods of the two studies. We then present an integration of the studies’ findings in terms of four kinds of learning challenges experienced by students in environmental education courses. The chapter ends by considering emerging issues for environmental education practice and research.

THE TWO EMPIRICAL STUDIES

The studies that inform this chapter were undertaken independently but drew on similar theoretical perspectives and methodological approaches.

Study 1: Environmental Issues in Secondary School Geography in England

This study focused on the teaching and learning of environmental issues within secondary school geography lessons in three English secondary schools (Rickinson, 1999a; 1999b). It was a qualitative investigation into the ways in which three teachers and twelve of their students (aged 13–15 years) dealt with controversial environmental issues within the geography classroom. This focus was motivated by the lack of exploratory classroom-based research in the field of geographical/environmental education at that time.

More specifically, the research investigated:

– the ways in which environmental curriculum topics were being taught by the teachers, and the thinking that lay behind these practices
– the ways in which such teaching was experienced by their students
– the similarities and/or differences between the perspectives of the teachers and the students.

These foci were explored in the context of lessons on environmental topics that were perceived by the teachers to be issues-based (as opposed to purely factual). Examples included lessons on rainforest development, nuclear power and indigenous peoples.

The research involved three sequential case studies of geography lessons, each of which lasted two months. Data were generated through lesson observation and audio recording, pupil lesson impression sheets and post-lesson interviews with teachers and students. Analysis of the data involved detailed examination of the actions and interactions of each individual teacher and student within the controversial issues lessons. This analysis was based on lesson transcripts and observational field notes (pictures of classroom practice), as well as post-lesson interview transcripts (commentaries on classroom practice) (see Rickinson, 1999b). Central to these methods was a desire to understand the teachers’ and students’ actions from their perspectives.

There were strong methodological links with several previous studies of teachers’ and students’ perspectives on classroom teaching and learning (for example, Connelly & Clandinin, 1986; Ghaye, 1986; Edwards & Mercer, 1987;
Cooper & McIntyre, 1996). This work also drew upon a conceptual approach that sees the curriculum as becoming manifest within classrooms, through teachers constructing and enacting particular combinations of subject matter and learning tasks (that is, subject matter-tasks) that are interacted with, and experienced, by students (cf. Nespor, 1987; Doyle, 1992; Erickson & Schultz, 1992).

Study 2: Swedish University Students’ Learning about Environmental Issues

This study investigated Swedish university students’ learning about environmental issues as part of undergraduate programmes in civil engineering, biology and doctoral environmental research (Lundholm, 2003; 2004a; 2004b; 2005). It consisted of three case studies based on different kinds of environmental content:

– first-year engineering students’ interpretations and learning during a compulsory ecology course
– biology students’ learning during an environmental auditing task, which encompassed issues relating to economics, business and administration
– doctoral students’ interpretations of the task of writing a thesis in the environmental field, focusing on natural science, social science or both.

The purpose of using these different kinds of environmental content was to explore possible differences in students’ learning in relation to the content being natural or social scientific. Furthermore, the research sought to explore the students’ learning processes and the way in which they interpreted and experienced tasks and courses in the environmental field.

In the first case study, interviews were carried out with six first year civil engineering students following a compulsory course in ecology. In the second case study, the dialogue between a group of four biology students was tape-recorded while they were working on a task about environmental audit reports. The third case study was based on interviews with six postgraduate students regarding their interpretations of environmental research and the task of writing a thesis. The empirical examples presented in this article are taken from the first two case studies with the engineering and biology students.

The transcripts of interviews and group discussions were analysed from an intentional perspective, that is, a perspective which takes into account the students’ aims defined as ‘projects’ (Halldén, 1988, 2001; Halldén et al., 2007). When analysing a student’s interpretation of a task, it can be described as a ‘problem’ that s/he is solving. The ‘problem’ that the student is working on can be interpreted as part of a future goal or ‘project’, such as to pass a particular exam, to successfully complete a whole course, or to gain knowledge for personal or professional reasons. Analysing data from such a project-oriented viewpoint means asking questions concerning the kind of ‘problems’ that the students are working on and the kinds of ‘projects’ in which these activities are made meaningful. Such questions give the researcher a chance to understand what the students are saying.
and doing, and may reveal possible explanations as to why they interpreted the content or task in a particular way.

Similarities and Differences between the Studies

As stated earlier, these two studies were undertaken separately at a time when the authors had no knowledge of each other’s work. It is therefore important to contextualise the subsequent discussion of their findings with a brief consideration of the similarities and differences between the two pieces of work.

There are some important commonalities in terms of the two studies’ approaches to researching environmental learning. For example, there were similarities in their:

– focus on the student perspective – both studies had a clear focus on accessing experiential accounts of the students’ environmental learning experiences
– methodological approaches – both sought to access student accounts through classroom observation and audio recording, and post-lesson interviews
– conceptualisation of curriculum processes – both drew on concepts from research on students’ interpretations of learning activities, in particular the distinction between the task as presented by the teacher (the enacted curriculum) and the problem (or ‘project’) as understood by an individual student (the experienced curriculum) (e.g., Halldén, 1988; Erickson & Schultz, 1992; Entwistle & Smith, 2002).

Alongside these commonalities, though, were differences in educational context. There is a clear distinction in the age groups of the learners, in that the English study focused on school students aged 13–15 years, whereas the students in the Swedish study were 20–45 years old. Connected with this difference, the learning contexts were distinct in the sense that the English study was concerned with compulsory schooling while the Swedish one looked at post-compulsory university studies. The foci of the environmental courses also differed: controversial issues in geography as compared with ecology for civil engineers and environmental auditing for biologists.

The motivation for writing this chapter was the degree of common ground that was evident between the two studies’ findings despite the clear differences in educational context and age of learners. What became clear to us was that there were a number of challenges that the students in both studies were experiencing (albeit in different ways or to different degrees) that seemed to be related to the environmental subject matter and learning tasks that were being studied. It is to the nature of these learning challenges that we now turn.

FINDINGS RELATING TO STUDENTS’ ENVIRONMENTAL LEARNING CHALLENGES

Based on an integration of the two studies’ findings, it is possible to identify four kinds of learning challenges that were experienced by students in their environmental education courses (Figure 1).
The challenges outlined in Figure 1 focus on incidents of students holding and expressing:

- different interpretations of the task – where individual students understand and enact learning tasks in varying ways
- different emotional responses to the content – where students’ learning experiences are shaped by an emotional reaction to an aspect of the topic being studied
- different opinions about the content as compared with the teacher/lecturer – where there is some kind of conflict between the beliefs or views of a student and the beliefs or views of the teacher/lecturer
- different views of what should be studied in a subject – where students feel that a certain type of task or content is not appropriate for them to be studying within a particular subject.

Each of these differences is now discussed in more detail using examples from the data of the two original studies.
Different Interpretations of the Task

The first type of challenge that was evident amongst the English school students and the Swedish undergraduates stemmed from the way in which learning tasks were interpreted in different ways by individual students. In the English study, this was seen very clearly with two students during a lesson about the indigenous peoples of the Amazonian rainforest. After watching a film on this topic, the students were asked to ‘write a poem of a day in the life of a Kayapo Indian’. The teacher envisaged this as an empathetic writing task, based on the view that it was important for students to develop the ability to empathise with different perspectives on issues such as deforestation. Through talking with students after the lesson, though, it became clear that this task was understood quite differently by two students. Box 1 shows the poems that Joanne and Aiden, both aged 13, wrote in this lesson and what their thoughts were about this task.

For Joanne, it would seem that this task was understood as an exercise in creative writing, as reflected by her concerns with the rhyming of words and the rhythm of her poem. Aiden, meanwhile, was more concerned with putting ‘some sort of content in it’ and trying to include information about what ‘they might think’. In contrast to Joanne, then, Aiden undertook this task as an exercise in empathetic (rather than creative) writing. What is interesting here is the way in which the task acted as a barrier rather than a facilitator to Joanne’s engagement with the subject matter. In other words, she was caught with writing a poem that rhymed, rather than thinking about the lives of the Kayapo Indians. This is an example of the way in which students’ differing task interpretations can present challenges for environmental learning.

In the Swedish study, the issue of task interpretations was seen in the case study of the biology students undertaking a task entitled ‘Environmental Reports: Superficial or Meaningful?’. This was one of five tasks all related to the social scientific environmental domain. The class was divided into groups of four and one of the groups chose the topic of environmental reports. The task was rather open-ended but the overall aim was to learn about environmental reports and understand how they were used in companies at the time. Audio recordings of the ongoing conversations of one of the small groups revealed a number of different possible interpretations of what had to be done. One idea was that the task would require the group to investigate and reflect on the environmental practices of the companies. Another view was that the task should involve comparing the companies’ environmental practices with what is stated in their environmental reports. A third option was that the work should focus solely on the environmental reports themselves regardless of what might or might not be known about the companies’ actual practices. In contrast to the poetry writing task discussed above, this was a group activity that took place over more than one session. What was interesting here was that these different interpretations of the task became an ongoing issue for the group and one that they kept coming back to and struggling with. Underlying these struggles was the question of the students’ own values and beliefs about the companies and the extent to which
these should be allowed to influence the ways in which they carried out this task. This brings us onto the next source of challenge, namely, students’ different emotional responses to the content.

Box 1: Joanne and Aiden’s Poems about the Kayapo Indians

**Joanne**

I’m a Kayapo
you know what I mean
I live by the grass along the stream
In my village, where I live
with my dad and my uncle Viv
I go fishing with my dad all
my mates think I’m sad.
The tribe was started long ago
by a couple of people all named Joe

‘It was a bit harder because I thought it would be easy and I started off really well and then I started, like no words left, no like words and I started making up a few [...] when I got things like [reading from her poem] ‘I live in the grass along by the stream, My face is painted yellow and green’, and then I couldn’t think of anything else ‘cos that line, when you put it with that it didn’t go because you’d be like this [acts out a gasp] gasping for air.’

**Aiden**

In the undergrowth of the forest floor
Wild boar roam free again
As our tribe is environmentally-friendly
the Western people corrupt and pollute.
As we fish for food
the women prepare vegetable stew.
While the children practice their hunting
skills, the men do the real thing.
The Western people want to change us
But we will not change our ways.
We are the Kayapo strong and true.

‘Well I wanted some sort of content in it, so I put that in ... I just put that in there to sort of put it in as a view, you know they might think. Well, they’re not using CS gasses or anything like that, are they? They’re just using what they have in the forest but whereas we just, well we buy it in gases, we use chemicals and so on [...] I just thought it would be good since I was writing a poem from their view and what they would probably think.’
Different Emotional Responses to the Content

A second area of challenge was where students were having to grapple with their own emotional responses to the subject matter they were studying. This issue was seen very clearly with Melanie, a 13-year-old student in the English study. Shortly after a lesson that involved watching two short pieces of film about rainforest destruction in Amazonia, Melanie described how one of these films had provoked a strong emotional response for her:

The second video [...] didn’t seem very interesting - cutting down trees, I don’t think that’s very my sort of thing, I don’t like things like that. I don’t like cutting down trees, I don’t like animals being hurt or moved or anything. I don’t like anything like that. Yeah I’m very against it, I think it’s awful.

What’s important is that her emotional response to the images within the film had a very real effect on her engagement (or, more accurately, disengagement) with the lesson. For, as she described:

I was hardly watching it, I was just paying a little bit of attention ‘cos I don’t watch things that are boring. If I think they’re boring I don’t watch them. [...] I just judge things before I see them and I didn’t think it was really very exciting … If I’ve got my own opinion on them, yeah I like hearing other people’s opinions because it’s their opinion, but no matter what you can’t change my opinion. You can try till you’re blue in the face but I will not change.

This can be seen as an example of a student pursuing a strategy of minimal engagement (‘I was just paying a little bit of attention’) as a result of emotions about the content of the lesson (‘I don’t like cutting down trees, I don’t like animals being hurt or moved’).

For the Swedish undergraduate biologists, the difficulty was the extent to which they should allow their personal values and emotions to shape the way they carried out the task about the companies’ environmental reports mentioned earlier. This is well illustrated by the following interchange within a small group shortly after they had set the task of examining the series of company environmental reports:

Karin: We can’t get too emotionally involved, that’s the problem!
Hans: No
Karin: We can’t actually include what we think
Nina: But yes, we can include what we think
Karin: No, not what we think about these companies and their-
Lena: We can’t say ‘I think they’re crap!’
Nina: No, exactly ‘MoDo is a hell of a company, cutting down the forest’ – no!
Hans: We share a common view of the companies –
[All the students are talking at the same time. Difficult to hear the different voices.]
Nina: Yes, yes, but I think the same way – companies suck! [She laughs].
That judgement we should not include
Karin and Lena: No
In a similar way to Melanie, one can see the way in which students’ feelings and emotions about the topic (namely, the environmental practices of large corporations) influenced their engagement with the learning activity. In the extract above, the group seems to reach some kind of consensus that getting ‘too emotionally involved’ would not be helpful and what is really needed is an impartial engagement with the task. What is interesting, though, is that this issue of impartiality remained an ongoing tension throughout the process of the group carrying out this piece of work. Even in their last group meeting, they were still debating what was and what was not ‘relevant to the focus of our work’.

While there are differences between the minimal engagement of Melanie and the impartial engagement of the engineering students, what they all have in common is students having to deal with their own individual emotional responses to environmental subject matter.

Different Opinions from the Teacher/Lecturer about the Content

This third category of challenge brings the teacher or lecturer into the picture alongside the students. Research on teachers’ thinking in environmental education has made clear that teachers can hold strong views on the issues that they are teaching (see, for example, Fien, 1992; Kyburz-Graber, 1999; Corney, 2000; Cotton, 2006). We have seen in the last section that the content of environmental courses can evoke strong feelings amongst the students. It is therefore possible for students and teachers/lecturers to hold strong and diverging views about the topics with which they are dealing. Negotiating such differences in viewpoint can present real difficulties for students, especially when they are only too aware that it is the teacher/lecturer who will be grading their work.

This type of situation was clearly seen amongst the engineering students in the Swedish study. In the interviews about their ecology course, several students brought up the issue of the lecturer’s perspective. Tobias, for example, talked about how he felt the course had been ‘angled from an ecological perspective [i.e.] everything that humans do has an impact on nature and if you affect nature, it is bad’. He went on to explain how this conflicted with his own views on this topic:

But, actually, humans are a part of the whole ecosystem too and therefore one has to live in harmony with nature. Humans did not used to do that, people in the Stone Age killed all the animals they saw. It wasn’t all that environmentally friendly as one might think. [Compared to me, the lecturer] values environmental problems in one way and ‘This is the right way’.

Tobias’ views were echoed by one of his classmates called Ola:

Our dear ecology lecturer has the viewpoint that man was God’s biggest mistake. Humans have only destroyed and so on. Many of us [students] have got this impression and then it feels kind of meaningless to discuss how we can solve these problems if the best solution is if everybody kills themselves. This was crudely put, but it is a bit of this kind of atmosphere that has
evolved. When somebody has asked a question about solutions to a certain problem you’ve got an answer that has been angled in that way […] He has these values that see man as an evil creature.

What is interesting in Ola’s comments is what he has to say about the ways in which his engagement with the course is affected by his perception of the lecturer’s perspective.

I think you quickly kill all interest in discussing, nobody wants to, what the hell I don’t want to pick a fight. It is also this exam, I think that’s a big part of this. If he has that opinion then you let him have it, then you don’t go into discussion because you know that, even though it shouldn’t be that way, the lecturer will be affected by discussions. I think, if you discuss the wrong things and have very different views and you don’t want to become an enemy to someone who is going to correct your exam. There are a lot of values in a subject like this. I mean, just think about environmental issues!

Here we see a student deciding not to express his real opinions on the topic for fear of ‘picking a fight’ with the lecturer and ‘becoming an enemy to someone who is going to correct your exam’.

A similar sort of situation was evident amongst some of the English students in their geography lessons. There was an important difference, though: for the university students, the difficulty was with having an opinion that conflicted with that of the lecturer; for the school students, the challenge was not having a strong view either way on an issue about which the teacher felt they ought to have an opinion. One example comes from a lesson about nuclear power, where the pupils had been asked to answer the question ‘Do you think nuclear power is a good thing?’ after watching a video about the Chernobyl disaster. Lisa, a 14-year-old student, explained her difficulty with this task as follows:

I could put ‘No nuclear power is not a good idea’, but I’d rather just write ‘No’ full stop. […] It’s not exactly hard to write what you think, but sometimes you’re thinking, you don’t write what you think, but you’re thinking of something, but it’s not what you think if you sat down and thought about it for ages. It’s just a spur of the moment thinking for what would be right to put down. [I wouldn’t want more time though...] because I don’t find it interesting. I wouldn’t sit around for an hour thinking full-on about whether nuclear power is a good idea, I wouldn’t find it interesting, it would just be a waste of my time. Maybe not for miss [i.e., the teacher] or for other people, but that’s generally what people think in our class.

In talking further about the nuclear power lesson, Lisa explained how she had developed a strategy for dealing with this problem of having to express opinions about topics which she was not personally concerned about.

I just usually write what I think, just the truth ... but sometimes I find it difficult, it depends. There’s been some things on what you think and [looking back through her book] I remember what it was, about when there
was that acid rain thing with the trees and miss said write what you think of what you see when you see those trees. I didn’t really think anything so I just put that [pointing to what she wrote which said: ‘When I see the effects of acid rain, I think it’s just deserted with nothing much exciting, but I feel sorry for the trees’] … I didn’t really feel sorry for the trees, it was just something to write because that was what Miss was trying to make us look at the effects the trees had from the acid rain. So I thought it was the thing to write down, it would make sense feeling sorry for the tree. Cos you wouldn’t want, like if these trees [pointing to trees outside window] were cut down, you wouldn’t want them cut down so I just wrote that, but I wouldn’t really care to be honest

[Researcher: Right, but you wouldn’t write that down - that you don’t really care?]

No. Cos miss wouldn’t tell me off and she wouldn’t say ‘Well done’, she’d just make me write it out again, she’d just have a conversation with me to see what I really think, so I just write that down and it saves me.

What we see here is an example of a student adopting a particular approach to the learning task that involves going through the motions or appearing to do what was expected without really doing it. The parallels between Ola in Stockholm and Lisa in Oxfordshire are striking in the sense that both are choosing a particular strategy in order to deal with the fact that they hold different views to their teacher/lecturer about the subject matter. This, we would argue, represents another important challenge for learning and teaching about environmental issues within formal education settings.

Different Views of What Should be Studied in a Subject

This final category of learning challenges stems from students holding strong views about the type of content that should be included within a particular school subject or university course. One example of this came from a 13-year-old school student in England who felt that learning about the peoples of the rainforest was ‘not really geography’. When interviewed shortly after a lesson in which he had watched a video and written a poem about the Kayapo Indians, he said: ‘In geography today I did not learn anything to my benefit’. When asked to elaborate on this, it became clear that this was related to his view of what was legitimate content for a geography lesson. As he explained,

Today we were mainly focusing on the people, and not the rainforest, and their habits in the rainforest. But that’s not really learning about the rainforest, it’s about learning things that people do in the rainforest. It’s like you’re learning architecture and learning what people can do in the house in many ways. You’re learning how to build a house, and they’re telling you what people can do in this house. It’s not really talking about the architecture of the house.
Far from being geography, Aiden felt that ‘You probably would have learnt about the Kayapo in history as history is about things that happened and people in many ways’.

In Lundholm’s study, there was also evidence of students experiencing difficulties with the nature and structure of their environmental curricula. An issue for the engineering students for example, was whether the course content was helpful to them in terms of working as an engineer in the future. Their complaints were that the content of their ecology course was:

(i) too focused on problems as opposed to solutions – One student, for example, argued that ‘I think ecology, it should relate to cases and actual examples instead of just saying how very bad everything is. For example, if you are building a road in the jungle you have to cut down the trees. Okay, that’s easy to understand, but what should you do?… The course ought to give solutions to problems and not only the problems. So that it is more adapted to construction. I think that would make the course more interesting for the students as well. And I think that more students would feel more involved and concerned. Some students did not prioritise the course because they felt it was just so much mumbo jumbo.’

(ii) overly concerned with the big picture - ‘Ecology, I don’t know, let’s say the water cycle … You don’t really need the big picture. It’s enough to know that in this place, water runs from here and on. It is rather extensive, it’s not absolute, sort of. And then the fact that it doesn’t relate to what you want or to what you are here for. It is kind of on the side or how to say. So it becomes - it feels, I don’t think you have to take the ecology course to become a good engineer. It is only a thing you have to do to get through’.

The common theme here is of students expressing personal evaluations of the content and the way it is organised within an environmental course or series of lessons. This observation suggests that another challenge associated with environmental curricula is that students can attach low priority to environmental content if they see it as inappropriate to the subject and/or unhelpful to a future professional training.

DISCUSSION AND CONCLUSIONS

The challenge of sustainability is one that necessitates learning at all levels within society:

the learning that will need to be done transcends schools, colleges and universities; it will be learning in, by and between institutions, organisations and communities. (Scott & Gough, 2003, p. xiv)

What this chapter provides is the early beginnings of empirically-based insights into the complexity of such learning within the formal education context (for further empirical analysis in this area, see Hopwood, 2007; Lundholm, 2008; Lundholm et al., 2008; and Rickinson et al., 2009). The studies reported in this chapter suggest that learning about environmental issues within settings such as
EXPLORING STUDENT LEARNING

schools and universities is far from straightforward. We have identified four areas of difficulty that can present challenges for students involved in environmental education. These occur where:

– individual students understand and enact learning tasks in varying ways
– students’ learning experiences are shaped by an emotional reaction to an aspect of the topic being studied
– there is some kind of conflict between the beliefs or views of a student and the beliefs or views of the teacher/lecturer
– students feel that a certain type of task or content is not appropriate for them to be studying within a particular subject.

We would argue that the first of these challenges is not particularly new or unique to learning in environmental education. That students can enact learning tasks in differing ways that have more or less correspondence with the teacher’s original intentions has been well evidenced in previous classroom-based studies (e.g., Nespor, 1987; Halldén, 1988; 1999; Wistedt, 1994; Cooper & McIntyre, 1996; Pollard et al., 1997). The challenge of students getting caught up in the procedural (rather than the substantive) aspects of a task, as we saw with Joanne’s focus on making her Kayapo poem rhyme, has also been noted in other contexts. For example, Edwards and Mercer’s (1987) study of creative learning activities in the primary school classroom highlighted the danger that children’s ‘understanding of things will remain at the level of specific experiences and practical procedures, while the hoped-for principled understandings are never grasped or articulated’ (p. 85). In this respect, then, the use of open-ended creative activities such as role plays and empathetic writing in environmental education comes with similar challenges as when they are used in other curriculum subjects.

However, the other three challenges – emotional responses, student-teacher conflicts and appropriateness of content – seem to be more closely related to the values-rich nature of environmental subject matter. These challenges all have a strong affective (and in some cases, normative) dimension, and in this sense, seem more particular to learning within environmental education. In the words of Ola, one of the Swedish engineering students, ‘There are a lot of values in a subject like this. I mean, just think about environmental issues!’ The findings reported in this chapter suggest that the ways in which such values play out in school or university classrooms are an important issue for practitioners and researchers involved with environmental learning.

Implications for Practice

We see important messages stemming from this work for teachers and lecturers seeking to facilitate environmental learning amongst their students. Perhaps the most important message is that environmental education can present a number of quite particular kinds of learning challenges for students.

Environmental subject matter can evoke strong emotional responses amongst learners, which can influence the nature and depth of their engagement with any learning activities set up by the teacher/lecturer. As we saw earlier, Melanie’s
dislike of ‘cutting down trees and animals being hurt’ resulted in her ‘just paying a little bit of attention’ to a video about deforestation. This idea of students choosing how and when to engage with emotive issues is supported by Watts and Alsop’s (1997) work on undergraduate students’ learning about radiation and radioactivity. One of their key findings was that ‘where issues are unpalatable or unsavoury there is a tendency for people to ignore them, to undergo “conceptual avoidance” ’ (ibid., p. 361). The key point here is that teachers/lecturers need to recognise that students’ difficulties with environmental learning activities can be as much due to issues of emotions and values as to challenges of knowledge and understanding.

Connected with this point, teachers/lecturers need to be aware that the similarities or differences between their own views and those of their students can be problematic for student learning and engagement. This issue was seen with the Swedish engineer Ola, who struggled with his ‘dear ecology lecturer’s viewpoint that man was God’s biggest mistake’, and as a consequence avoided ‘going into discussion [for fear of] becoming an enemy of someone who is going to correct your exam’. It was also evident with the school student Lisa who explained how she had developed a strategy for dealing with her teacher’s requests for her to express an opinion about issues that she did not see as particularly interesting or controversial. In her words, ‘I didn’t really feel sorry for the trees, it was just something to write because that was what Miss was trying to make us look at the effects the trees had from the acid rain’.

Finally, there is the important point that it cannot be assumed that students will share teachers’/lecturers’ belief in the importance of dealing with environmental/sustainability issues within particular curriculum subjects. The engineering undergraduates in Lundholm’s study were far from convinced that their ecology course was helpful to them in terms of working as an engineer in the future, while one of the school students in Rickinson’s work felt strongly that learning about the indigenous peoples of the rainforest was ‘not really geography’. These examples suggest that curriculum developers and practitioners need to think much more carefully about the ideas that students bring to the learning situation about what is and is not appropriate and helpful to study in different curriculum contexts.

A further point relating to all of the above challenges is that their occurrence in school and university classrooms may well be largely hidden. Students may well have very good reasons for wishing to keep their differences of opinion or views about the subject matter hidden from their teacher or lecturer. This point highlights the importance of renewed efforts to improve our understanding of environmental learning from the perspective of the learners which brings us to the implications for research.

Implications for Research

In our view, there has been all too little in-depth investigation into the dynamics of environmental learning, particularly in terms of the experiences of learners. As Payne noted in the late 1990s, there has been ‘a lack of consideration in environmental education theory and research practices about the children who are
the subjects of environmental education’ (1998, p. 20). In comparison with fields such as science and mathematics education, environmental learning has been both under-researched and under-theorised (Dillon, 2003; Rickinson, 2006). Furthermore, as pointed out by Falk (2005), ‘It is becoming more widely appreciated that narrowly focused and limited views of environmental learning limit both its understanding and a meaningful assessment of its impact’ (p. 273).

In view of this situation, we see a need for more serious research attention to be given to issues of learners and learning within environmental education. The case studies discussed in this chapter suggest a need for more sophisticated understandings of several aspects of the learning situation. In particular:

- the role of values and emotions in the learning process and the relationship between the affective and the cognitive aspects of students’ experiences
- how the relationships between the beliefs and values of teachers and students can influence students’ learning
- the factors that can facilitate and hinder learners’ willingness to engage with and benefit from environmental learning opportunities
- the extent to which the kinds of learning challenges reported in this chapter may be relevant within different educational contexts.

Developing and improving understandings on these matters will require research that is empirical as well as theoretical, concerned with learning as well as teaching, and grounded in ideas from beyond as well as within environmental education. Most significantly it will need serious recognition for learners as active agents rather than passive recipients of environmental learning.

REFERENCES


Mark Rickinson
Independent Research Consultant and Research Fellow,
University of Oxford, UK

Cecilia Lundholm
Research Fellow,
Department of Education and Stockholm Resilience Centre,
Stockholm University, Sweden