The Mexico Alaska Youth Interchange Case Study: an Educative Experience Promoting Action and Continuity

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Submitted in fulfilment of the requirements for the degree of
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I am the author of the thesis entitled

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Abstract

In our world immersed in a global socio-ecological crisis, actions are needed to address the diverse and complex challenges of environmental problems. Long-term efforts in environmental education are essential to fulfil various needs in this crisis. It is imperative to prepare and educate young generations to understand this worldwide challenge to create sustainable solutions. Latin-American countries offer a great landscape to study, test and implement new educative approaches in this matter. Action competence (AC) is one of these approaches in environmental education with great potential due to its focus on developing learner's abilities and willingness to participate in environmental matters. This thesis investigates the case of the Mexico Alaska Youth Interchange (MAYI) as an educative experience that promoted high school and university students’ action competence. The goal of the MAYI was to develop a unique learning opportunity, promoting learning in natural resource management and indigenous cultures, through scientific and traditional knowledge perspectives establishing international links. I used a case study methodology to explore the influence of the MAYI in in two Mexican communities (from Oaxaca and Michoacán). I analysed the MAYI using the aspects of the AC framework. The field educative experience showed to nurture the growth of the participant students observed in each of the six AC framework aspects: experience, knowledge, visions for the future, reflection, action taking and connections with a group of diverse participants. The MAYI was a provocative experience, for many students it was a transformational process of knowledge reconstruction that helped developing their self-authorship. The students expressed highly connected knowledge rather than declarative and memorized information. They also expressed to have visions for the future to continue their education and aspire a professional development. The students proved to be highly reflective creating comparisons, and constructing new cultural and environmental arguments. The students were highly motivated to act and participated in cultural and environmental activities. Some actions were
identified to start as ideas while they became thoughts as they were working out as actions. The students expressed connection involving their emotions, ideas and actions. All this elements gave deep insight to use the AC framework in real life research. In addition, I integrated Dewey’s idea of *experience continuum* as the continuity of students after their educative experience and a property for the action competence approach. As part of this continuity, I present an analysis of the extension and influence of the MAYI students to their friends and family. As a conclusion the AC framework was a highly valuable qualitative tool to observe the promotion of action in environmental education programs such as MAYI. The framework could explicitly incorporate two more elements: the continuity, which is an element that helps identify the students’ development of the abilities and willingness to participate in the solution of environmental problems, and the social connections, particularly family and friends, which were both regulators (supports and constrains) of action and the starting point to influence to generate social capital in their community. Programs like the MAYI are extremely valuable environmental educative opportunities as they are capable to promote action and the search for educative continuity of the participants, with an extensive possibility to influence family and friends. Further research can continue exploring the AC framework to include elements such as the emotions and the cohesiveness of the group. The concept of action competence needs to be understood further within individuals’ social structures.
TABLE OF CONTENTS

CHAPTER 1 INTRODUCTION ............................................................... 1
1.1 Rationale for this study ......................................................... 1
1.2 Thesis and personal background ......................................... 3
1.3 Research questions ............................................................... 4
1.4 Overview of the thesis ......................................................... 4
1.5 Significance of the research ................................................. 6

CHAPTER 2 LITERATURE REVIEW .................................................. 9
2.1 Environment as a concept ..................................................... 9
2.2 Environmental Crisis or the Anthropocene Era ....................... 11
2.3 Environmental Education (EE) ............................................. 13
   2.3.1 Traditional environmental knowledge ............................. 14
   2.3.2 Globalised perspectives in environmental education ......... 15
   2.3.3 Education for Sustainability ......................................... 18
2.4 Action competence approach .............................................. 21
   2.4.1 Action competence framework .................................... 23
   2.4.2 Action competence research studies ............................. 24
2.5 Experiential learning ........................................................... 25
2.6 Social Transmission of Action Competence ........................... 27
2.7 Summary ............................................................................. 30

CHAPTER 3 METHODOLOGY .......................................................... 32
3.1 Objective ............................................................................. 32
3.2 Introduction ......................................................................... 32
3.3 Research questions .............................................................. 33
   3.3.1 Research goals ............................................................. 33
3.4 Epistemology ...................................................................... 34
   3.4.1 Experiential Knowledge .............................................. 34
   3.4.2 Indigenous Knowledge integrated with Environmental
            Studies and Sciences .................................................... 35
3.4.3 Action competence .......................................................... 36
3.4.4 Constructivism ............................................................... 37
3.4.5 The values of this research ............................................ 38
3.5 Case Study Research ............................................................ 39
   3.5.1 Locating Case Study in Qualitative Research ................ 39
   3.5.2 Case Study Methodology ............................................. 40
| 3.5.3 | Interpretive Paradigm in Environmental Educational Research | 41 |
| 3.5.4 | Possible generalizations from case studies | 43 |
| 3.5.5 | Strategies to analyze case study evidence | 44 |
| 3.5.6 | Validity in case study methodology | 45 |
| 3.6 | **The Unit of Analysis** | 45 |
| 3.6.1 | Defining the case | 45 |
| 3.6.2 | Bounding the Case Study | 47 |
| 3.7 | **Three Phases of Analysis: The Research Propositions** | 50 |
| 3.7.1 | Action Competence and its six aspects | 51 |
| 3.7.2 | The Continuity of the Experience | 53 |
| 3.7.3 | Transmission of Action Competence | 54 |
| 3.8 | **My participation as researcher in the 2011 MAYI** | 54 |
| 3.8.1 | Research during the field educative experience | 54 |
| 3.8.2 | Research in the communities | 55 |
| 3.8.3 | Ethical Issues | 56 |
| 3.8.4 | My Role as a Participant Researcher | 59 |
| 3.9 | **Analysing the Case Study Evidence** | 61 |
| 3.9.1 | Data Collection | 61 |
| 3.9.2 | Data Analysis | 61 |
| 3.9.3 | Validity in this case study | 63 |

**CHAPTER 4**  
**MEXICO-ALASKA YOUTH INTERCHANGE: PROMOTING ACTION**  
| 4.1 | Objective | 65 |
| 4.2 | Processing the Findings | 65 |
| 4.3 | An Integrated Perspective of the Six Aspects | 67 |
| 4.4 | Experience in MAYI | 70 |
| 4.4.1 | Synopsis | 81 |
| 4.5 | Reflections in MAYI | 81 |
| 4.5.1 | Synopsis | 95 |
| 4.6 | Knowledge in MAYI | 95 |
| 4.6.1 | Synopsis | 110 |
| 4.7 | Visions for the Future in MAYI | 111 |
| 3.7.1 | Synopsis | 118 |
| 4.8 | Action Taking in MAYI | 118 |
| 4.8.1 | Synopsis | 131 |
CHAPTER 5 CONTINUITY AND INFLUENCE AFTER THE MEXICO-ALASKA YOUTH INTERCHANGE

5.1 Objective ................................................................. 145
5.2 Introduction .............................................................. 145
5.3 The continuity of the MAYI Experience ................................. 146
  5.3.1 Analysis of the continuity ........................................... 147
  5.3.2 Previous experiences ................................................ 151
  5.3.3 Quality of the MAYI Experience .................................... 151
  5.3.4 Intention for Further Actions ....................................... 152
  5.3.5 Continuity in Studies ................................................ 153
  5.3.6 Actions Taken ....................................................... 155
5.4 Place and Emotions as Drivers in the Experience Continuum ........... 156
  5.4.1 The place in the Learning Experience .............................. 156
  5.4.2 Emotional balance in the experience continuum ............... 158
5.5 Social influences on the students’ experience continuum ............. 163
  5.5.1 San Juan Nuevo Parangaricutiro, Michoacán ...................... 164
  5.5.2 Ixtlan de Juarez, Oaxaca ........................................... 165
  5.5.3 Group cohesiveness and trustworthiness .......................... 169
  5.5.4 Supports and Constrains to the Continuity of Actions .......... 170
5.6 MAYI Students Extending their Experience .............................. 174
  5.6.1 Analysis of the communication with F&F .......................... 175
  5.6.2 Messages communicated ............................................ 175
  5.6.3 MAYI seeding action and social capital ............................ 186
5.7 Summary ........................................................................ 188

CHAPTER 6 DISCUSSION AND CONCLUSION .............................. 189
6.1 Objective ...................................................................... 189
6.2 Overview of the purpose of this research ................................. 189
6.3 Overview of the Research Questions and Findings .................... 192
  6.3.1 Experience ............................................................. 193
  6.3.2 Reflections .............................................................. 194
  6.3.3 Knowledge ............................................................. 195
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.3.4</td>
<td>Visions for the Future</td>
<td>196</td>
</tr>
<tr>
<td>6.3.5</td>
<td>Action Taking</td>
<td>197</td>
</tr>
<tr>
<td>6.3.6</td>
<td>Connectedness</td>
<td>198</td>
</tr>
<tr>
<td>6.4</td>
<td><strong>Overview of the Research Questions and Findings</strong></td>
<td>199</td>
</tr>
<tr>
<td>6.4.1</td>
<td>The continuity of the MAYI experience</td>
<td>199</td>
</tr>
<tr>
<td>6.4.2</td>
<td>The MAYI extended to friends and family</td>
<td>202</td>
</tr>
<tr>
<td>6.5</td>
<td><strong>Implications of the research</strong></td>
<td>205</td>
</tr>
<tr>
<td>6.6</td>
<td>Limitations and future research</td>
<td>207</td>
</tr>
<tr>
<td>6.7</td>
<td>Concluding comment</td>
<td>209</td>
</tr>
</tbody>
</table>

**BIBLIOGRAPHY**  
211
List of Tables

Table 2-1: Aspects of Action Competence used in New Zealand study (Arthur (2011), adapted from Eames et al. (2010b)) .................................................. 51
Table 2-2: Experience elements ........................................................................ 53
Table 4-1: The AC aspects (families) and associated codes ......................... 69
Table 4-2: Examples of the AC aspect ‘Experience’ in Spanish and English translation .......................................................................................................... 71
Table 4-3: The AC aspect ‘Experience’ (continuity codes) ......................... 75
Table 4-4: The AC aspect ‘Experience’ (self-authorship and provocative experiences) .............................................................................................................. 77
Table 4-5: Examples of the AC aspect ‘Reflection’ in Spanish and English translation ........................................................................................................ 82
Table 4-6: The objects of reflection within the AC aspect ‘Reflection’........ 88
Table 4-7: The reflections inducing change within the AC aspect ‘Reflection’ ............................................................................................................................... 91
Table 4-8: The reflections on specific issues within the AC aspect ‘Reflection’ .............................................................................................................................. 94
Table 4-9: Examples of the AC aspect ‘Knowledge’ in Spanish and English translation ........................................................................................................ 96
Table 4-10: The AC aspect ‘Knowledge’ (relational codes) ...................... 105
Table 4-11: The AC aspect ‘Knowledge’ (declarative codes) .................. 106
Table 4-12: MAYI Examples of the AC aspect ‘Visions for the Future’ in Spanish and English translation .......................................................... 112
Table 4-13: The AC aspect ‘Visions for the Future’ codes ..................... 114
Table 4-14: MAYI examples of the AC aspect ‘Action Taking’ in Spanish and English translation .................................................................................. 119
Table 4-15: The AC aspect ‘Action Taking’ (Indirect Action codes) ......... 124
Table 4-16: The AC aspect ‘Action Taking’ (Direct action codes) .......... 125
Table 4-17: MAYI Examples of the AC aspect ‘Connectedness’ in Spanish and English translation ................................................................. 132

Table 4-18: The AC aspect ‘Connectedness’ (Thinking codes) ............. 135
Table 4-19: The AC aspect ‘Connectedness’ (Feeling codes) ............... 138
Table 4-20: The AC aspect ‘Connectedness’ (Acting codes) ............... 140

Table 5-1: Dimensions of continuity showing examples expressed by MAYI participants. .............................................................. 149

Table 5-2: Emotions expressed by the MAYI participants in relation to the experience continuum ....................................................... 158

Table 5-3: Observations, challenges and some possible ways to address them in San Juan Nuevo Parangaricutiro, Michoacán, Mexico .......... 171

Table 5-4: Observations, challenges and some possible ways to address them in Ixtlan de Juarez, Oaxaca, Mexico .............................. 173

Table 5-5: Topics in the interviews with MAYI students and F&F .......... 176

Table 5-6: Knowledge messages the MAYI participants expressed to their families and friends, including the involved topics. .......... 177

Table 5-7: Knowledge messages F&F expressed about their conversations with the MAYI participants, including the involved topics. .... 178

Table 5-8: Reflective messages the MAYI participants expressed to their families and friends including the involved topics. .......... 179

Table 5-9: Reflective messages F&F expressed about their conversations with the MAYI participants including the involved topics .......... 179

Table 5-10: Experiential messages the MAYI participants expressed to their families and friends including the involved topics. .......... 181

Table 5-11: Experiential messages F&F expressed about their conversations with the MAYI participants including the involved topics. ... 181

Table 5-12: Actions in messages F&F expressed about their conversations with the MAYI participants including the involved topics. .... 183
Table 5-13: Messages from MAYI students and their F&F transmitted to a second-degree connected person. .................................................... 184
List of Figures

Figure 4-2: MAYI Network map in Action competence ...............................68
Figure 4-3: Network of codes - ‘Experience’ aspect .................................70
Figure 4-4: Network of codes - ‘Reflection’ aspect .................................82
Figure 4-5: Network of codes - ‘Knowledge’ aspect ...............................96
Figure 4-6: Network of codes - ‘Visions for the Future’ aspect ...............111
Figure 4-7: Network of codes - ‘Action Taking’ aspect ..........................119
Figure 4-8: Network of codes - ‘Connectedness’ aspect .......................132
Chapter 1  Introduction

What is unique about us as a species, is that we not only adapt to the natural and social worlds through appropriate actions, but we also create theories and stories to help us understand and even explain the world and our actions in it.

Bruner (1997), *Celebrating divergence: Piaget and Vygotsky*

In this research thesis, I explore the encouragement and potential of students’ actions towards socio-environmental issues. I focus the attention of the research on the analysis of the experience of a group of Mexican students travelling to Alaska to learn about socio-environmental issues. Then, after the field educative experience, I venture into the students’ communities to explore the transmission of the messages they have learned to promote action competence at a community level.

This introduction presents the general rationale, my personal journey and interest in the topic, and the case to study. Then, I present the research questions followed by an overview of each chapter of the thesis. Finally, I introduce the general significance of the research.

1.1 Rationale for this study

As humans, we have always had a profound and interconnected relationship with our home planet. With time, our understanding of this relationship has changed, but not the relationship itself. Currently, we are experiencing a socio-environmental crisis that is affecting our social environment at the same deep level. Many efforts have been made to address this crisis. For instance, at the moment, we are globally following the development idea of sustainability. Sustainability is a form of development that is constantly evolving to foster peace, reduce global warming, reduce the inequalities between countries, and avoid the marginalisation of women and girls (UNEP, 2005).

For this environmental crisis, I understand the need to improve the quality of our lives, individually and globally. This improvement implies a change in our teaching-learning methods at all levels. In this context, environmental education (EE) offers many learning approaches that rely heavily on our relations being flexible, which allows us to adapt to new
circumstances. Within EE, a focus on sustainability is leading educative efforts, which was taken on board and encouraged by the United Nations. The changes in learning have involved different understandings in education, its approaches and pedagogies. This Education for Sustainability (EfS) aims to enable citizens of the world to face the challenges of the present and future to make relevant decisions for a viable and healthy world. Therefore, to meet the challenge, learners need the knowledge, the skills, the engagement and commitment, and a respectful behaviour towards the earth and its diversity.

This environmental education case study is framed by this socio-environmental crisis, and this need for environmental education and beyond (after the educative experiences) is underpinned by the need for regional and global EE research. In this case, I focus on a couple of Mexican communities that have progressed in managing their forest as their primary natural resource for livelihood. I centre the attention on a group of young people, who are defining their place in their communities and in this world.

Personally, I have been exposed to several experiences in environmental education, both as learner and facilitator. In both roles, each experience has been educative for me. When a learner, some of this experiences directed my interest and commitment to Environmental Education. Some of the most relevant experiences have been when I was learning about the natural world being interconnected with human social activities and reality. As Scholz (2011) mentions, these experiences were in a particular moment when I was able to mindfully construct my own connections with the environment, which is composed of biotic, abiotic and technological layers. I have made many decisions and taken paths in my journey integrating those links. I have been involved in the educational milieu since the moment I was born; some experiences have been miseducative, some have been reformative, and some have been educative. All of them have contributed to my ideas and personality and have changed over time. It is this personal background that leads me to search for understanding about experiences in education and the change in people attached to this experience.
1.2 Thesis and personal background

In this study I continue the exploration of environmental learning in expeditions with high school students that I started with my master’s degree dissertation (Caballero-Aspe, 2009). In my previous research I compared educational experiences in the field with classroom learning experiences. These field experiences provided the students with new scientific language, and particularly with a deeper understanding of environmental concepts and local problems. For instance, the students developed contextualized knowledge, creating a sense of connection with the social and ecological systems, and developed a thinking process that would directly impact their world. After this experience, and the support of other research, I am a firm advocate of teaching-learning experiences in the field for environmental education. They are significant and unique resources to encourage individuals to be critical by connecting their knowledge, thinking process, experiences and emotions (Barraza & Bodenhorn, 2012; Caballero-Aspe, 2009; Tytler, Barraza, & Paige, 2010).

With this background, I became involved in a conservation project in a rural community in Mexico. This project gave me the opportunity to apply my environmental education efforts into developing experiences for people. With a conservation team, I was aiming to develop commitment and actions at the community level in an area of many environmental challenges. My experience was of high educational value to myself, as I understood the complexity of transforming knowledge and sympathies into commitment and actions to solve environmental problems. With this learning in the field, I became deeply interested in the topic of transforming education into action. After reading about the action competence approach in environmental education (Jensen & Schnack, 2006) I started developing some theoretical insights and understandings about the complexities to act consciously. Then, the framework to research action competence in regards to education for sustainability (Eames, Barker, Wilson-Hill, & Law, 2010b) gave me the ideas, thoughts and tools to collaborate to research following this approach. I have worked closely with one of the main environmental education researchers in Mexico, Dr Laura Barraza, for many years. With
her, I found the possibility to develop the present study. And lastly, I was invited by Dr Barbara Bodenhorn and Dr Laura Barraza to participate in the Mexico-Alaska Youth Interchange (MAYI), an experience in environmental education without precedents in Mexico.

MAYI was a bi-national educational project, which involved students from indigenous communities and students in Mexico and the United States. In an environment of cultural interchange and a strong component of sustainable local management, MAYI focused on promoting critical thinking to students with a learning experience of scientific and traditional socio-environmental knowledge (Bodenhorn, 2008; Caballero-Aspe, Ramírez, Barraza, & Bodenhorn, 2011).

1.3 Research questions

The purpose of this investigation was to understand the development of action competence in the participants of the Mexico Alaska Youth Interchange. Also, as the research accompanied the students after the field experience, it provides an interpretation of the students’ continuity of education and the transmission of their learning to their friends and family.

The study included three phases: the educative experience, the students’ continuity of the experience, and their influence on friends and family. The six aspects of the Action Competence (AC) framework were used to make sense of the observations. The research is an exercise in identifying elements that would help improve the AC framework in field educative experiences. Therefore, the central research questions was:

How does the understanding of the development of AC be informed by the study of a field educative experience?

1.4 Overview of the thesis

This dissertation is composed of six chapters. Chapter 2 addresses the literature review framing this research within the body of knowledge. It covers the relevant development of the knowledge of the environmental crisis. After introducing the relevant literature about environmental education and education for sustainability, it outlines the different
educative approaches such as experiential education and constructivism. Then it examines the particular action competence approach. Finally, it will cover the ideas of social transmission in a network of people and build social capital.

Chapter 3 presents the methodology, explaining the epistemological theories used and their justifications. It explains the qualitative nature of the research as a case study design with an interpretive approach. The chapter covers the unit of analysis – in this case, the Mexico-Alaska Youth Interchange – the theoretical propositions that helped conduct the research, and a discussion about my participation as a researcher. Finally, it provides a description of the interview process and data processing with the assistance of the Atlas.ti QDA software, and the strategies for its analysis are presented.

Chapter 4 covers the analysis of the MAYI, using the action competence (AC) framework from Eames et al. (2010). It presents the results of the qualitative data analysis. The interpretation is conducted and organised using the six aspects of the AC framework: experience, reflections, knowledge, visions for the future, action taking and connectedness. Each of these aspects is presented in detail bringing elements that provide a sharper understanding of the potential of the AC aspects after a field educative experience. Some of these show how the experience was provocative for the students. The students’ reflections appeared to be comparative and evaluative, and showed new arguments being created. The knowledge expressed by the participants was mostly declared (rather than defined) and reconnected to the participant’s realities. Stimulated by the MAYI the students envisioned and had plans for their own professional future. Some of these plans were detected to be successfully executed by the students after some time. The actions taken by the students were mostly communicative and were evident once the experience finished. Finally, the students reflected their connections, not only through knowledge but also through the emotions and actions they were doing. This provided a richer understanding of each of the aspects of the AC framework.
Chapter 5 explores the students’ continuity of experiences after the MAYI. The chapter unpacks the significant elements that were necessary for the process of continuity after the MAYI. Indeed, the participants displayed actions that were interpreted as part of the development of action competence, and under favourable circumstances. Then, based on the differences between the two observed Mexican communities, it is discussed how the group cohesiveness, social supports, and constraints affected the students’ continuity. Beyond this social pressure, the students extended their influence through conversations to others (peers, friends and family) and their messages were a source and catalyst for action. Finally, the chapter interprets these social influences according to the concept of social capital in education, providing an argument to understand the students as agents of influence and action in their communities.

Chapter 6 provides a discussion and conclusion of the previous ideas. I present a richer view of the Action Competence (AC) by including the concepts of experience continuum and the extension of MAYI students’ interactions with the community.

1.5 Significance of the research

Many EE efforts in Mexico are planned as extracurricular programs, which become significant non-formal environmental education opportunities offered in rural communities. This research shows that the action competence approach is an excellent way to develop field experiences as an alternative to formal education. With an extensive understanding and with some refinements, I support the action competence framework as an excellent tool to evaluate and design experiences in education, not only in formal but also in informal education. Experiences with this AC approach can promote shared social experiences toward developing abilities to take actions. They can also stimulate continuity in education engagement in individuals. Furthermore, field educative experiences can instigate a form of democratic participation through communicating messages, as well as promote the development of social capital.
After the Decade for Education for Sustainability (2005-2014) declared by the United Nations, this research is relevant within the Global Action Programme (GAP) launched by the UNESCO (2015). The research becomes directly relevant in one of the areas of the Programme, where empowering and mobilising youth is a priority. Beyond these programs, the research is significant to understand real stories of real young Mexicans, inspiring people that continue to face the problems affecting our environment and us.
Chapter 2  Literature Review

2.1 Environment as a concept

The planet where we live is going through profound changes in the environment at a systemic level. These systemic changes originate in human activities, which place large demands on food, fresh water, timber, fibre and fuel. These demands have debilitated the benefits we receive from the environment and the intensity of its services (the natural capacities of ecosystems to provide, regulate, and respond resiliently), driving us to an environmental crisis. The Millennium Ecosystem Assessment (MA) categorises environmental services as follows: supporters (e.g. nutrient cycles and primary production), provisions (e.g. food, wood and fibre), regulatory (e.g. climate regulation and water purification) and cultural (e.g. spiritual and educational). In return, the demands of our current lifestyle affect the ecosystem services and, as a whole, affect directly and indirectly our own wellbeing. The constituents of human wellbeing currently affected are: security (i.e. personal safety and disasters), basic materials for life (i.e. shelter and food), health (i.e. access to clean air and water), good social relations (i.e. social cohesion and mutual respect), and freedom of choice and action (i.e. opportunity to achieve what an individual values doing and being). Basically, the environmental crisis in which we live now is the result to our common actions in our environment. Only if we understand the relationships and interactions that we alter within the environment will we be able to find alternative solutions to overcome this crisis.

The actual concept of environment has a history of around 400 years. Etymologically, the term “environment” refers to a “state of being environed” (Harper, 2001). The term is essentially connected to the commencement of the industrial era. And the term is misleadingly linked to the notion one specific moment of transformation in the British culture or “industrial revolution” (instead of a long period of innumerable international and gradual causes). It appeared to be first recorded by Scottish historian and philosopher Thomas Carlyle, who translated a text by
Goethe (*Dichtung und Wahrheit*, book XIII). In this text was a description of the landscapes from an Ossian painting by Jean-Auguste-Dominique Ingres. The description included the term *Umgebung*, a mid term between natural and spiritual surroundings with which Goethe meant to describe the perfect location for “English melancholy” (Jessop, 2012, p. 711). The Carlyle translation focused on the nature element of it, while Goethe’s German meaning meant to include the social and cultural surroundings or conditions that were affecting an individual (Jessop, 2012; Scholz, 2011; Slater, 1952).

With this focus on the natural elements without the social conditions, in Western societies, the study of the environment was called “natural history” until about 1850. Later, it was isolated more and divided into different fields like geology, zoology, and botany among many others. The ecological concept of environment, however, started with Jean-Baptiste Lamarck and the development of an evolutionary thought, settling down with Darwin’s theory of species adaptation in 1859 (Scholz, 2011). With this evolution, the modern concept of environment comes from integrating the analysis and understandings of these scientific fields, and the systematic study of the natural world (Hollar, 2011). Another conception of the environment discussed by Capra (1994) and Sterling (2001), is to look at it as a systemic process in which each part (biotic or abiotic) plays a dynamic role. And so, a re-integration to the social cultural and spiritual conditions took place in the concept. The understanding of the environment is not considered unique anymore; different conceptions of environment coexist, and cultures from all over the world have developed different views (Mazzocchi, 2006). Sauvé (1996, p. 13) for example, has developed a typology that considers six conceptions of the environment. These conceptions are:

- The environment as nature. The environment is perceived solely as an appreciation to respect and preserve nature.
- The environment as a resource. This notion of environment allows intervention, it is seen as an entity to be managed and used.
- The environment as a problem. This view suggests that there is something in the environment that needs to be fixed and solved.
• The environment as a place to live. This suggests a place to know and learn, and to plan and take care of.
• The environment as the biosphere. This is an environ where we all live together;
• The environment as a community project. This notion includes a place where everyone is involved, where we share and work together towards a common interest.

2.2 Environmental Crisis or the Anthropocene Era

Each of the previously mentioned conceptions of “environment” refers to specific interactions between humans and their environment. These interactions can originate, promote and develop different attitudes, perceptions and actions in humans. In return, the perceptions, attitudes and actions of humans can have positive or negative interactions in the environment.

The actions of humans in the diverse environments of Earth have carelessly altered its systems, particularly in the last two hundred and fifty years. Since 1800 (and particularly since 1945), humanity as a whole has changed its interactions with the environment. This has happened in relation to the growth of our population and the conception of individual needs in relation to economic development. The development of these populations has been supported by the exponential use of fossil fuels (Fressoz, 2015).

Human activities, particularly involving the use of fossil fuels, have been demonstrated to change the different systems of the earth. Humanity has also been able to detect the effects of its actions on Earth, conceptualised as a connected whole entity. The impacts have been registered in the form of urbanisation and landscape transformations, climate change, deforestation, and desertification (Hamilton, Bonneuil, & Gemenne, 2015). Species extinction is rapid with current extinction rates 1000 times higher than natural ones (De Vos, Joppa, Gittleman, Stephens, & Pimm, 2015). Impacts particularly include stress during high demand
resource extraction and its consequential waste dumping. Disruption of geo-
chemical processes such as the nitrogen cycles have become evident. Large
scale sediment shifting, sea-level rise attached to anthropogenic warming,
and prevalence around the globe of artificial organic molecules are
characterising our human global impacts (Zalasiewicz et al. 2012 in
Hamilton, Bonneuil, & Gemenne, 2015; Kopnina, 2012). These human
actions now can be seen as a “force of nature” representing thresholds that
mark a striking change from the last Holocene epoch. According to the
Geological Time Scale, the Holocene started after the last ice age (around
12,000 years ago), and is characterised by relatively stable global
temperatures. Furthermore, the Anthropocene, a new geological epoch, is
the Holocene successor (a formal decision about this epoch is expected in
2016-2017 by the International Commission of Stratigraphy). This
geological epoch is based on the idea that human activities rival geological
forces, influencing the course of all systems in Earth. The concept of
Anthropocene is coined to emphasise human circumstances impinging on
the existence of the Earth, and not as mere global ecological crisis. In
comparison with “global change” or “environmental crisis”, the
Anthropocene concept places humanity, its time and history, at the centre
and as a global driving force in the planet (Fressoz, 2015; Hamilton et al.,
2015; Semal, 2015).

Human activities, as the leading force of change of the suggested
Anthropocene period, relate to the impact of advanced industrial capitalism.
The planetary changes associated with this economic and political system
has compromised the health and quality of non-human life, but also of many
individuals and societies. Understanding how our activities influence the
Earth’s systems and societies offers the power and responsibility to take
action and change our relationship with the planet to find a balanced
existence (Steffen et al. 2011 in Fressoz, 2015; Kopnina, 2012).

As a global society we have started to understand the global impacts
of our activities. In this sense, the United Nations organised the Conference
on Environment and Development to state the principles of Sustainable
Management on Forests, adopted by 178 governments in 1992. In 2000, it also organised the 2000 Millennium Summit where 189 countries committed to economic developmental objectives, but they specifically addressed the sustainable development principles as part of country policies (UNEP, 2012a). But, even with these agreements, the world remains on an unsustainable track based on the last environment and natural resources report by the United Nations Environmental Programme (UNEP), the Global Ecological Outlook (GEO-5) assessment published in 2012. This GEO-5 reported that, despite the 90 key goals set by the international community to support sustainable management of the environment and improve human wellbeing, there has been only a few areas that have seen significant progress, for instance: the elimination of the production and use of substances affecting the ozone layer, the removal of lead from fuel, and improved access to water supplies. But little or no progress has been detected in mitigating other problems related to human activity such as climate change, decreasing deforestation, recovering fish stocks, or reducing desertification and drought problems. The UNEP report addresses the urgency for humanity to change its pathways of development, so the critical thresholds of nature are not exceeded and the life-support functions on the planet are not compromised (UNEP, 2012a, 2012b). The need to catalyse environmental action to improve the quality of life in human communities (Barraza, 2006) is urgent.

The need for humans to act upon the challenges of a changing environment remains dependent on our environmental notions. In this way, the previously mentioned conceptions of environment, discussed by Sauvé (1996), offer a comprehensive understanding of our interactions with the environment. Environmental education, then, arises out of necessity as a reaction to the impacts of industrial capitalism.

2.3 Environmental Education (EE)

From a historical perspective environmental education involved survival skills that our ancestors used in response to their environmental
vulnerability. They developed a complex, adaptive and responsive system of learning to acquire these skills. It involved the development of physical and mental survival capabilities that were relevant for their living area, and could be transferred to new regions. The progress of this system of learning was facilitated with the development of habits, customs and collective memories, which supported the family and tribal group membership. These skills maintained, in the human groups, a relationship with their surroundings that resulted in covering all their living needs (Kopnina, 2012; Smyth, 2006).

2.3.1 Traditional environmental knowledge

Perhaps this historical perspective gave rise to what we now know as traditional or indigenous knowledge, a form of environmental education and knowledge that is still current and contemporary. In contrast with modern societies, indigenous cultures have had over thousands of years a strong and sacred relationship with their environment. Their traditional or indigenous knowledge has been rediscovered by western societies, as a model for a healthy interaction and use of the environment and as a rich source for new perspectives about the relationship between humans and nature (Mazzocchi, 2006). Traditional societies’ education about the environment was conveyed through learning by doing, complemented by watching and by listening to stories in the form of myths or personal memoirs told by elders and mentors (Anderson, 2012). The conception of environment that indigenous cultures have is based on different traditional knowledge systems. This is defined by the General Director of the United Nations Educational, Scientific and Cultural Organisation (UNESCO), as:

The indigenous people of the world possess an immense knowledge of their environments, based on centuries of living close to nature. Living in and from the richness and variety of complex ecosystems, they have an understanding of the properties of plants and animals, the functioning of ecosystems and the techniques for using and managing them that is particular and often detailed. In rural communities in developing countries, locally occurring species are relied on for many - sometimes all - foods, medicines, fuel, building materials and other products. Equally, people’s knowledge and perceptions of the environment, and their relationships with it, are often important elements of cultural identity (Mayor, 1994 in Emery, 2000, p. 15).
Indigenous knowledge, then, is cumulative knowledge and beliefs passed down through generations by cultural transmission. Its environmental understanding centres on the relationships between all living beings, including humans. Indigenous knowledge becomes significant environmental education for its historical use of resources in a continuity based on a deep understanding of the complex relationships between humans and their environment. For these reasons, this learning becomes relevant in current times with a worldwide environmental crisis centred on human activities (Gadgil, Berkes, & Folke, 1993; Rich, 2012).

2.3.2 Globalised perspectives in environmental education

Perhaps one of the most important calls for action in environmental damage was the publication of the book The Silent Spring by Rachel Carson in 1962 (Carson, 2002). As a brilliant science writer, she helped to publicly unmask the environmental impacts of the use of pesticides such as DDT, and human attempts to control nature through synthetic substances. This book gave validity to a more sophisticated environmental movement; moreover, with the development of ecological thinking in life science disciplines a conceptual framework for the environment was established. Thus, for decades, there was a significant effort to make students “environmentally conscious” by increasing their awareness to the severity of environmental problems. For instance, a trending paper was “Changing learner’s behaviour through environmental education” by Hungerford and Volk (1990). Research was mostly conducted within a United States context and focused on individual habitual activities at home regarding waste and water recycling and economising (Breiting, Hedegaard, Mogensen, Nielsen, & Schnack, 2009b; Breiting & Mogensen, 1999). In this tradition a globalised environmental education often involved learning facts about nature, including details from distant places. These facts and learning, turned to be isolated from the industrialised, suburban or the rapidly developing agrarian communities in which many young adults were targeted. These are strong traditions that are still happening in current EE.
In response to this, environmental education started as a discipline within the natural sciences. Fortunately, this understanding is changing (Jickling & Wals, 2008; Kopnina, 2012). These widespread environmental education trends, and efforts were not successful in determining environmental attitudes. The emotional element was clearly missing, leading to environmental education efforts aimed to change environmental attitudes, emotions and beliefs rather than conceptual knowledge (Pooley & O’Connor, 2000).

The world’s first intergovernmental conference on environmental education (EE) was organised by UNESCO in cooperation with the U.N. Environment Programme (UNEP) and was convened in Tbilisi, Georgia (former Soviet Union) in 1977 (UNESCO, 1977). Environmental Education emerged as an urgent alternative to modifying human behaviour (Barraza, Duque-Artizabal, & Rebolledo, 2003). This was basically a response to The Tbilisi Declaration, which stated, “Environmental Education had an important role in the preservation and improvement of the world’s environment, as well as in the sound and balanced development of the world's communities” (Pandey, 2007, p. 194). In this context, the idea of sustainable development came to exist in the Brundtland Report Our Common Future in 1987. In this report, sustainability was defined as the “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland et al., 1987). Since then, EE has been reoriented and redefined to promote an active sense of participation within society (Barraza et al., 2003). Within this timeframe and redefinition, EE has gone through critical stages of development, each responding to current social, political and historical contexts (Barraza and Ceja-Adame, 2011). During the 1970s and 1980s, the emphasis in EE programs was to promote positive attitudes towards the environment through the establishment of methods and rules for environmental management. The following period, from the 1980s to the 1990s, focused on critical analysis. EE was promoted by different social and environmental movements through the framing of the environment as a
communal place to live. The discussion on the conception of EE became more aware of the environment understood as an eco-socio-system (Goffin, 1998) where acknowledgement of the interaction among the biophysical and the social arrangements becomes indispensable (Sauvé, 2000). During the following decades, from the 1990s to the 2000s, EE faced a conceptual crisis. The practice of EE was focused on the development of activities, as a way to legitimise its actions. In this way, EE was strongly conceived of as a synonym for developing courses, workshops, and talks about ecology, rubbish and water, without evaluating the processes or effects of these activities. Nevertheless, this opened a research opportunity around EE and this period became critical (Barraza & Ceja-Adame, 2011). The main research goal was to identify the change in human behaviour as a consequence of EE programs, and since the year 2000, an analytical period has been driving the ontological and methodological discourses around EE. The emphasis is to look at different paradigms of EE to analyse and evaluate how individuals interact, learn and act in different contexts and situations, focusing on the analysis of “processes” in order to have a better understanding of how individuals interact with the environment. An important function of EE is to enable students to become critically aware of how they perceive the world with a view to fostering citizen engagement with social and environmental issues and participation in decision-making processes (Jickling & Wals, 2008).

But what does EE mean? Over time, its definition has been dynamic and veering. As Barraza and Ceja-Adame (2011) discuss, the formal environmental education definition can be found from progressive ideas such as “the search for the optimum development in youths and building a better society”, to definitions strongly attached to natural science education and the promotion of an ecological spirit. In this research, I adopt Sauvé’s (2000) definition of EE: “Environmental education is a dimension in contemporary education, concerned with optimising the network of relations among environments — social groups — individuals,” which has been supported in a plurality of disciplines.
Any EE that aims to optimise the network of relations among people and with the environment, as Sauvé’s (2000) definition suggests, should incorporate the learner’s participation in decision-making processes. I believe this is an essential element to assist individuals to discover how to participate in the transformation of their world. Learning about environment and sustainability should imply learning for change and transformation (McBain, Phelan, Val Brown, & Hay, 2014). Within this learning, the network of relations becomes a critical aspect of the learning and the actions taken as a result of those interactions.

### 2.3.3 Education for Sustainability

In the context of a globalised industrialised capitalism, education has been significantly influenced, transforming environmental education into education for sustainable development or education for sustainability (Jickling & Wals, 2008). Education for sustainability (EfS) reflects the need to respond to the social, economic and environmental challenges that the world is facing nowadays (O’Connor, 2014).

After the Brundtland report in 1987, The United Nations Conference on Environment and Development constructed in 1992 a set of plans and international agreements aiming to achieve global sustainable development in the 21st century. The Earth Summit was celebrated, and Agenda 21 was the outcome document imprinting the report of international agreement. In Agenda 21, countries committed to promote environmental sustainability through education. Its chapter 36, “Promoting Education, Public Awareness and Training” was one of the few aspects of Agenda 21 with which all nations from both North and South hemispheres agreed (Kopnina, 2012; UNESCO-UNEP, 1996). More recently, the new Agenda of the United Nations called ‘Transforming our world: the 2030 Agenda for Sustainable Development” (UN, 2015) is a call for action. According to it, for the next 15 years the United Nations will be supporting 17 ‘sustainable development goals’ that concentrate on the economic, social and environmental dimensions of sustainable development. Goal 4 of the agenda is focused on quality education that promotes lifelong learning, and states:
By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development” (UN, 2015, p. 17).

Sustainable living is perceived as the new paradigm for all decision levels: individuals, communities, and nations of the world. But what does sustainable living means? What do we need to do in order to achieve a sustainable society? Barraza et al. (2003) mentioned that there is a need to incorporate some principles in the educational agenda such as the development of a constructivist, participatory and transformative pedagogy. To adopt this new pattern will require a significant change in the attitudes and practices of many people (IUCN, UNEP, & WWF, 1991, p. 5). For this change to happen, we need to ensure that education programs include a holistic approach where all individuals can reflect on the importance of the ethics of sustainable living. Ideally, this holistic approach should integrate teaching and learning methods that can promote a critical and reflective view in their learners (Barraza et al., 2003). According to Sterling and Huckle (2014), it is crucial to learn how to think holistically, or adopt a system learning approach to have a better understanding of how sustainability issues are connected as systems.

Education for sustainability according to UNESCO (2009, p. 5) is a process rather than a fixed goal, and it will always accompany the building of relationships among individuals and groups with their environment (Sterling & EDET Group, 1992). EfS is both present- and future-oriented, and it is in this continuum of time that EfS teaches to design and implement present actions that will positively impact the future. In this sense, EfS leads students to develop an overall capacity to contribute to “a more sustainable future in terms of environmental integrity, economic viability, and a fair society for present and future generations”. Education for sustainability has a strong focus on helping individuals to reflect on their own actions and to connect with their everyday life. Matters of
environmental quality and human development are central to EfS (Agyeman, 1999).

But the conception of education for sustainable development was a policy-driven transition, which according to Jickling and Wals (2008) has a conceptual risk. They argue that EfS would teach students about a kind of citizenship and participation within a neo-liberalist agenda or tactics. Education within this approach would avoid questioning the capitalistic approach that triggered and gave rise to the environmental crisis centred on human activities; instead, it would favour the development of free-market capitalism tactics. Education for sustainable development or sustainability, or for anything, is suggestive of a training activity that prepares individuals for some instrumental aims. This idea is contrary to the concerns of education (i.e. enabling people to think for themselves), and without a critical approach, it would train individuals only for an assemblage of correct environmental views (Jickling, 1992; Jickling & Wals, 2008). Thus Jickling and Wals suggest the adoption of a critical approach to official paradigms such as EfS, and favour education that encourages learners to develop their own tools to interact and decide in the diverse environments of this world, instead of promoting a goal-oriented outcome.

Along these lines, we need to develop a strong moral responsibility as individuals and as a society to have a sense of clarity within sustainability. We need to consider the needs and perspectives of the different cultures and stakeholders. Acting in a time of environmental crisis requires learning to act and this can only be achieved if we teach and learn how to develop ideas, to work collaboratively, to share views and opinions, to become independent learners, and how to propose creative solutions that address our environmental crisis. In the next section, I will refer to some literature that explores the key ideas that enable individuals to participate in an active way.
2.4 Action competence approach

As a response towards the status quo of environmental education, starting with the millennium, discussions focused on contributing to an educational ideal which envisioned promoting social change, rather than control (Jensen, Schnack, & Simovska, 2000). A democratic approach to education is seen as an important element of liberal education. The concept of action competence (AC) started to anchor and shape a critical approach to environmental and health education (Schnack, 2000). The AC integrated an emancipatory idea of environmental education concerned with the acritical acceptance of concepts such as sustainability. Authors were searching for education that could incorporate dynamic and flexible standards for learners, allowing discovery, self-determination, autonomous thinking and social learning (Wals & Jickling, 2000). With a democratic approach in education, some intended to search for genuine participation to develop the capacities of students to be active agents of their own learning (Simovska, 2000). Efforts were directed at understanding the worldviews of children and young people rather than attempting to represent ideas of others that decontextualize experiential learning (Hart, 2000). The AC concept incorporated the forms of experience so deeply that the body started to be appreciated as the interface for somatic learning that develops an embodied intelligence in human action and interaction (Payne, 2000). Authors were exploring the conditions for learners within environmental education that promoted participation and partnership in the search for a plural and democratic society in countries in transition (Csoobod, 2000). Thus, important elements such as reflections, participation, visions, commitment, knowledge and dialogue were recognised (Jensen, 2000). In this way, the action competence concept sharpens the profile of environmental education by including the pupils (Breiting & Mogensen, 1999).

The action competence approach includes two elements: on one side, the “competence” refers to the ability, the willingness and the qualifications to participate, therefore to become able. On the other side, “Action” is a broad concept that needs to be understood in all its meanings: for instance
behaviour, activities, movements and habits. The core of the concept of AC is that actions are targeted, conscious and intentional. This means that actions need to be explained within a context. Actions are consistent with the motives and reasons, rather than mechanisms and causes (Breiting & Mogensen, 1999; Jensen & Schnack, 2006; Mogensen, 1997; Mogensen & Schnack, 2010). A concise definition of action competence was given by Karsten Schnack, one of the most recognised authors on the subject, in 1996: “[Action Competence is a] capability based on critical thinking and incomplete knowledge, to involve yourself as a person with other persons in responsible actions and counter-actions for a more humane world” (in Lundegård & Wickman, 2007; Simovska, 2000). AC implies three aspects according to this definition: first, the learner needs to engage and gain insight into the socio-environmental problems; second, the learner must have ownership of her/his own will to act for a change and solution to socio-environmental problems; and third, the learner must take action to achieve change. To avoid misinterpreting the wording of “incomplete knowledge” (as it can be understood as opposite of “complete knowledge”, where a learner can “consume” knowledge until fullness or appropriateness), I favour the understanding of knowledge from a constructivist approach. That is, learning is never directly apprehended in the objectivist’s sense. The approach would focus attention on the individual learners and the societies. The learners create, and re-create, the understanding of a reality through association of meanings during the interactions with the environment (Bruner, 1997; Guba & Lincoln, 2008; Noffke & Somekh, 2009). In this learning process, it becomes critical for the learners to understand why, and for what purposes, they are undertaking a particular action (Jensen, 2000; Palmer, 1995).

Action Competence is the result of an envisioning utopia; it is an ideal that is not a teaching method or an objective to be reached (Jensen & Schnack, 2006; Schnack, 2000). Fien and Tilbury (2002) suggest that in order to achieve transformative change towards ecological sustainability, an action competence approach should be embedded in the learning process.
That is, support the development of people capable of imagining alternative ways of social development and communal wellbeing with the ability to participate and act within these alternative ways. AC is concerned with the growth and development of individuals in a community, as a natural process of change. Therefore, action competence must have a deep understanding of democracy. As Jensen and Schnack (2006) discuss, democracy deals with concerns about the environment, health and peace (fields of the action competence approach) as fundamental educational tasks. Accordingly, this educative approach understands the members of a democracy as participants rather than spectators, albeit not equally (and not always) active in everything. Instead, individuals are prepared to be always potential willing participants.

2.4.1 Action competence framework

In 2010 a team led by Chris Eames from the University of Waikato and the Teaching Learning Initiative in New Zealand developed on the idea of AC into an evaluation framework in the context of education for sustainability (EfS). The framework was developed as a partnership of university researchers, national advisors and a number of enviro-schools under the financial support of two Teaching and Learning Research Initiatives (TLRI) (Arthur, 2011; Eames, Barker, Wilson-Hill, & Law, 2010a; Eames, Cowie, & Bolstad, 2008; Eames et al., 2006). This partnership published the research framework, including a teacher’s guide, that provided assistance to school teachers in order to help students to develop AC (Eames et al., 2010a).

The authors related the AC framework to the international conceptions of education for sustainability (i.e. think, feel and act), and the key competencies from the New Zealand Curriculum (Eames et al., 2010b). The framework suggests six aspects: knowledge, experiences, visions for a sustainable future, actions, reflections and connectedness. It included the definitions and observable suggestions to be analysed in each aspect, which will be detailed in the Methodology chapter.
2.4.2 Action competence research studies

Research using the AC approach included a case study where pedagogical practices in an intervention strategy aimed to enhance socially endangered children’s life opportunities through learning and social inclusion. In this project Jensen (2013) used a perspective where the involvement of participants, their practice and their ownership became central. A large study in residential homes with 200 students succeeded in incorporating the schools, their friends and their home. The environmental information they co-developed with the participants was used for intervention promoting reflections on the efforts developed during their everyday life practices. A study in New Zealand presented research about the involvement of 9- to 11-year-old students in co-designing an Eco-school. Students’ learning was tracked between the set-up and execution of an eco-classroom and the AC concept. The project employed peer-education and reactive tools to manage the changeover of different student groups participating in the design (Wake & Eames, 2012).

In the United States, Stephens (2015) analysed the conditions needed to create the mechanisms for hybrid spaces (the physical, social, and personal dimensions in and out of school). The author suggests that these spaces support the development of many of the constructs of AC; however, younger students needed support for accurate conceptual understanding. As a result of this study, students seem to focus more on community health rather than the natural environment, and the author suggests considering broader experiences of youth living in a growing urbanised setting.

The authors of the action competence framework in New Zealand, Wilson-Hill, Law, and Eames (2008), sought to refine the model linking it to student learning in EfS with feedback from the architects of the AC approach. Within the context of the curriculum program in EnviroSchools the framework settled on six aspects: knowledge, experiences, visions for a sustainable future, actions, reflections and connectedness. The aspects present ideas for teaching and learning in classes to support education for sustainability. The framework has been used in few and very specific
circumstances for communal and non-formal education contexts. For instance, Arthur (2011) carried out an intervention in an environmental science class in a senior secondary school with a student-centred approach and an emphasis on recognising the culture of students to develop AC in them. The author suggests that the AC framework, starting with the students’ cultural background, can lead to the development of AC in EfS. In Latin America, Aguayo (2014) designed and developed an EfS website addressing ecological sustainability issues about a lake in Chile. The environmental topics highlighted the impact of the problems in the local community and visitors. The author identified the potential and value of such a communication tool, to facilitate transformative understanding processes and empower community members, and to engage them into socio-environmental action and participation.

The literature regarding the use of the AC framework (Eames et al., 2010b) is still developing, but it documents the opportunity for it to be employed in a non-formal education context to create unique environmental education experiences in Latin American countries. The principles provided in the AC framework offer excellent tools to be tested outside of formal school settings. This research, therefore, helps to address the literature gap of non-formal education experiences using an AC framework, and to understand the development of youth actions in a Latin American context.

2.5 Experiential learning

In an educational context, daily experiences become key pedagogical components to learn about sustainability issues (Hill, 2013). Experiences are the processes by which human beings perceive the world and interpret it through a cultural lens (Kopnina, 2012). Previous experiences are an essential link with people’s actions. Actions, as intentional behaviours, are a fundamental part of the overall experience that we call “life”. John Dewey (1916, p. 1) conceptualised life as “a self-renewing process through action upon the environment”. Openly, there is a continuum of experiences involved in Dewey’s conception of life. The continuity of life and experiences
define the human existence. Dewey defines the continuity of experiences as “a continual reorganisation, reconstruction and transformation of experience” (1916, p. 50). He discusses the self-renewing process as the recreation of beliefs, ideals, hopes, happiness, miseries, and practices. Education should deliberately create experiences and conditions to confidently self-author people’s own possibilities.

Dewey discusses this continuity of experiences as his principle of experience continuum. Not all experiences are equally lived and valued. Experiences are individually perceived and evaluated. This evaluation produces a rich and diverse interpretation of life. In this way, not all experiences are equally educative. There is a possibility to have miseducative experiences when they produce a lack of sensitivity and responsiveness and if they distort or prevent growth and interest in having further similar experience. Some experiences do not lead to education, for instance when they intend to increase skills in a particular direction narrowing the field of further possible experiences for the person; or experiences that could be immediately enjoyable but promote a careless attitude. Not leading education experiences include those that are disconnected from each other, or perceived to be as such. On the other hand, a pleasant experience might promote the opposite; that is, stimulate the learner to search for similar educative activities or experiences (Dewey, 1998). Therefore, educative experiences can be valued in regards to Dewey’s experience continuum principle, where learning experiences promote the search for further educative experiences.

The principle of experience continuum then becomes significant for education and implies a challenge for educators, as it might not always be within reach of their observations. There is a need to select, prepare and design educative experiences that can become fruitful and creative attractants of successive experiences. The search for successful experiences involves effort, intention and will, to continue with the internal growth. These elements create a unique relationship between the continuity of
experience and the action competence approach (Dewey, 1998; Jensen & Schnack, 1997).

Learners need to take some time to process the educative experiences, to understand them fully, to connect them with other relevant experiences and to incorporate them in their everyday life. This need is well recognised by environmental education and action competence approaches (Arthur, 2011; Jensen, 2000; Jensen & Schnack, 1997; Stephens, 2015). Nonetheless, research still needs to provide detailed examples of behavioural change in students who underwent a meaningful educative experience. The experiences where continuity has no clear limits will bring forth an element of growth among the learners, and will promote the search for those drivers involved in meaningful experiences. This study engages in this gap, using the experience continuum principle to examine a case in environmental education that incorporates and integrates meaningful experiences in a group of young students.

2.6 Social Transmission of Action Competence

Education as a social action forms societies by communicating and transmitting habits of action, thinking and feeling. As Vygotsky points out, education involves communication and interaction between persons with different capabilities (Cole & Wertsch, 1996). Communication and interactions among people constantly “rewave” the social fabric (Dewey, 1916). These ideas relate to the previously stated definition of environmental education which integrates the concern into an optimised network of relationships between the environment, social groups and individuals (Sauvé, 2000).

Humans are connected to each other in sets of social relationships (or interpersonal links), which connect individuals (or organisations) into groups. These social networks are characterised by the flux of energy among their members, which includes the interaction and communication (or interchange) of information. People within networks are the creators of knowledge and the channels of its transmission. These ideas help us to
understand human relationships in their context (Castells, 2000; Sanz Méndez, 2003).

Social networks occur naturally and have constantly evolving structures, as people within them are continuously changing their internal roles. The bonds within these networks can be short-term or lifetime relationships, casual or intense, and personal or anonymous. People’s actions and the flow of energy determine the actual structure of the network; for instance, seeking and making new friends, having large or small families, work in personalised or anonymous workplaces. On the other hand, the flowing energy across social ties has contagious properties. In social networks, for example, references about sexually transmitted diseases, money flow or fashions are common (Christakis & Fowler, 2009). But these are not the only kind of information that can be transmitted; recent research is now exploring how deep emotions and behaviours can be transmitted within social networks. For example, an individual’s happiness is reported to be dependent on the happiness of people whom this person is connected. Alcohol consumption, smoking, obesity and cooperative behaviour have been reported as possible dispersing lifestyles and behaviours. Individuals transmit information to and influence other people’s behaviour, and not only of those who are directly connected to them. The contagion also displays a probability to go beyond and be transmitted to individuals connected indirectly. In doing so, information and behaviours could also exhibit the three-degree property of influence, which means they can potentially reach a person’s friend’s friend’s friend (Cacioppo, Fowler, & Christakis, 2009; Christakis & Fowler, 2009; Fowler & Christakis, 2008, 2010). Few authors have explored the connections between experiences in environmental education and the flux of information or message transmission among people. The research around this area has focused mainly within the cybernetic (i.e. online) social networks (Greenhow & Robelia, 2009; Liccardi et al., 2007; Robelia, Greenhow, & Burton, 2011).

In regards to the transmission and influences within social networks, the concept of social capital has introduced a broader concept. The social
capital is a widely used term, which includes personal elements and communal resources to improve community life and to solve social problems. According to Putnam (1995, p. 19), social capital is “the connections among the individuals – social networks – and the norms of reciprocity and trustworthiness that arise from them”, a concept that includes a structural (social networks) and a cultural phenomenon (social norms) (Norris, 2002).

The social capital, beyond the property of transmission or contagion, incorporates the knowledge about networks and norms, and the trustworthiness of individuals to act together and to pursue common goals. It enhances cooperation to pursue the common interests of the group or community. Social capital can be expressed in many forms like individual skills, informal networks and exchanges, or long-term actions (Colquhoun, 2000; Nelson, Kaboolian, & Carver, 2003; Putnam, 1995). These assets nurture trust and collaboration bringing parallelisms between the concepts of AC and social capital. The concept of social capital is relevant as a context to determine the success or failure of action initiatives.

The concepts of social capital and action competence are similar in terms of their goals, such as the empowerment of individuals and communities to create collective actions that drive changes (Colquhoun, 2000). However, Fien and Skoien (2002) emphasise that social capital focuses on the social aspects that empower groups, while action competence emphasises in the individual skills and knowledge to enable action. In this way, social capital favours learning the skills and knowledge of action competence. Nevertheless, Cox (1995, 1997; in Colquhoun, 2000) points out that an individual’s experiences play an essential role in the development of social capital. In addition, experiencing together engenders trust and recognition of common ground, allowing people to appropriate a common understanding and direction of action (promoting social capital). This variation opens the possibility to explore further the links between social capital and action competence. It highlights the need to explore cases of environmental education experiences, and its effects as a source of information transmission, with its possibility to influence other people. This
study engages in this gap, exploring the possibility of the action competence to be transmitted with the contagion property of the social networks and the power of cohesion of social capital.

2.7 Summary

This literature review constitutes the relevant conceptual framework and theoretical structure on which this study is founded. I reviewed some aspects of the environmental crisis and discussed how it is dependent on the multiple human activities and their interactions with the environment. I also discussed some of the different conceptions of the environment in order to understand the distinctive views of nature from a Western and Indigenous perspective.

Environmental education (EE) is concerned with the network of relations among humans and the environment. Education for Sustainability (EfS) is introduced as a series of ideological and methodological practices that are perceived to change the patterns of human behaviour towards a more sustainable future, with the risk of missing to address the fundamental elements that originally led our society into the environmental crisis. I also reviewed some of the main historical events that socially and politically influenced the educational paradigms in building the environmental discourses.

I introduced the three most important conceptual ideas on which this research is based:

- The action competence approach and framework (C. Eames)
- The experience continuum (J. Dewey)
- The concepts of social networks and social capital

The action competence is the main approach to the interpretation of the educative experience of this research. This interpretation is assisted by the action competence framework and its essential aspects. The use of this framework, in a non-formal education context in Latin America, is of significant value to the progress of the action competence literature.
John Dewey highlights the importance of experiences in education, particularly through the principle of continuity. This is a valuable concept used to recognise meaningful educative experiences, based on the students’ actions to search further experiences as part of their growth. This research introduces a valuable understanding of the students’ actions, using the continuity principle to examine what occurs after the students have been exposed to an educative experience.

Finally, the concepts of social networks and social capital are introduced to help explain what makes students undertake actions after their educative experience, and how they convey information to friends and relatives about the experience. The connections between social capital and the transmission of messages in relation to action competence are explored. This research focuses on the understanding of the environmental educative experiences as a source of transmission of information and the possibility to develop action competence.
Chapter 3  Methodology

3.1 Objective

This chapter presents the methodology used to conduct this qualitative research. The chapter covers the research questions, and explains the epistemological theories used and their justifications. The methodological approach was a case study in design. This chapter presents a description of the unit of analysis, the theoretical propositions to conduct the research and a discussion about my participation as a researcher. Finally, a description about the methods of data collection and the strategies for its analysis are presented.

3.2 Introduction

The aim of this thesis is to make sense of an environmental education field project through an action competence framework. The educative field experience, or case, was the Mexico Alaska Youth Interchange (MAYI). A case study research methodology was used to explore the perspectives of the participants during and after the MAYI.

This research is qualitative and the analysis is based on the data extracted from the interviews and observations collected during the experience. The methods (or “techniques for gathering evidence”) and the collection of data were guided and justified by the methodology and epistemology. The selected data consisted of recorded observations and field notes, and recorded interviews (Carter & Little, 2007; Harding, 1987). The methodology is constructed and informed by the epistemology, which in turn provides the justification and evaluates the knowledge produced by this thesis. More specifically, the epistemology is the “analysis of the assumptions, principles and procedures in a particular approach to inquiry” (Carter & Little, 2007; Schwandt, 2007b).
3.3 Research questions

The purpose of this study is to understand the development of the action competence in the participants an environmental education field project, and the extensions to their society. The study comprises three stages: the educative experience, its continuity, and its influence from the participants to their friends and family. The six aspects of the Action Competence (AC) framework are used to make sense of the observations. The research is an exercise to identify elements that would help improve the AC framework in field educative experiences. Therefore, the main research questions leading the pathway of this research was:

1) How does the understanding of the development of AC be informed by the study of a field educative experience?
2) In order to scrutinize this development I explore the three stages with the following specific questions:
3) How did the MAYI supported students’ Action Competence?
4) What can a field educative experience reveal about the Action Competence aspects to enable refinement of the AC framework?
5) How did the MAYI students’ AC develop over time?
6) How did social influences impact on the MAYI students’ AC?

3.3.1 Research goals

This study aims to participate in the analysis and discussion of action competence theory in environmental education projects. This study documents action competence in educative field experience settings, which in turn is used to propose refinements of the action competence framework.

Firstly, one of MAYI’s main focuses was to “skill students” so they could think critically about their own and others’ perspective on a diversity of sustainable subjects (Barraza & Bodenhorn, 2012). This methodological and epistemological approach is in line with the AC philosophy, which makes the AC framework pertinent to observe this case study.

Secondly, considering that education permeates and influences society, I focus on that influence and the possible extensions of the MAYI
project. In order to do that, the study extended to the participant’s communities and inquiry for suggestions of transmission (either communication or encouragement) of the complex action competence idea. This study presents an examination of the results of an environmental education project, the way its participants expressed the knowledge they acquired, and if this knowledge transmitted a degree of action within the learners’ community.

3.4 Epistemology

Epistemology is how we understand and justify the knowledge. It’s our theory of knowledge.

Epistemology is the study of the nature of the knowledge and its justification. Epistemological issues deal with theories of knowledge and the justifications used to create new knowledge (Carter & Little, 2007; Yin, 2014). This section will expose the theories and premises that justify my analysis.

‘Knowledge’ is one of the elements of this study. During the writing process, my understanding about knowledge has been modified and interweaved with different theoretical perspectives such as experiential knowledge, constructivism, indigenous knowledge, and action competence. The following sections explain each of these perspectives in the context of this study.

3.4.1 Experiential Knowledge

This research is based on the study of a case, which is a lived experience. Every individual gains information and wisdom from every lived experience through direct engagement: this is how experiential knowledge is defined by Schubert and Borkman (1994: cited in Berg, M. J. 2008). In this perspective, a researcher uses all of her or his senses (seeing, hearing, feeling and understanding) through empathic participation in everyday events. Likewise, the researcher frames the research decisions, questions, and understandings based on his or her own lived experiences. The
researcher’s experiential knowledge is always present, and the research benefits from making it explicit (Berg, 2008). The present epistemology section provides a brief background and context on my experiential knowledge as the researcher involved in the production of this thesis.

As a participant in the MAYI, I was in a shared educative experience with the students and we had very similar activities during our time in Alaska. My interactions with the students were rich, and I listened to their voices and ideas (during and outside the interviews) and consider them fundamental for the objectives of this research. One characteristic of experiential knowledge involves understanding how the researcher intends to appreciate the knowledge of “others” as an embedded element of the enquiry process. During the activities of the MAYI, we were learning from diverse knowledge and standpoints that also affected my understanding of knowledge for the purposes of this research. That is how my interaction with the students helped me shape this research. The next sub-headings will discuss in detail these epistemological perspectives.

3.4.2 Indigenous Knowledge integrated with Environmental Studies and Sciences

One form of experiential knowledge is referred as Indigenous Knowledge or Local Environmental Knowledge, and it refers to the information and meanings that are provided by active participation from members of a group or a community (Berg, 2008). One of the main goals during the educative experience was learning from people with knowledge from two apparently “opposed” perspectives. These perspectives were present in people we met and interacted with. As learners, we were deeply influenced by these people and their perspectives of the relationship between humans with the earth.

During the MAYI there was a powerful and a clear intention to create bridges between indigenous and scientific knowledge. Indigenous knowledge, environmental studies and sciences programs in education are part of my ideological understanding. One of the arguments is that, teaching
science is fundamentally concerned with interdisciplinary understanding about the “coupled human-natural systems with a normative commitment to sustainability” (Vincent & Focht, 2011, p. 14). Furthermore, Indigenous traditions of knowing focus on relationships between humans and the earth. Indigenous understanding is guided by a sense of interrelation of all beings and the conception of mutual dependency, to finally appreciate the earth as a living being. Humans are not in charge but merely part of this interconnectedness. This is in contrast with dominant scientific discourses that believe that the earth is an inanimate object and humans are in charge of managing other beings. These viewpoints provide exceptional opportunities to promote critical thinking skills and to develop solutions for environmental issues (Rich, 2012).

3.4.3 Action competence

For this study, I used the “action competence” (AC) framework in environmental education as the main approach to understand and interpret my data. The framework was designed recognising AC in students as an educational goal for education for sustainability (EfS) and environmental education. This work explored the relationship of three elements. The links between teaching practices supporting AC, the development of the key competencies established in the New Zealand Curriculum, and the international conceptions of education for sustainability (Wilson-Hill et al., 2008). I have mentioned in the previous Chapter 2 some points where the conceptual approach of EfS is problematized by some authors. For the purpose of this research, I keep an open approach that recognises EfS as a possible palliative to the fundamental properties that gave rise to the ecological crisis. Even so, this tool for action competence is built under the formal education context and in the search for to promote education that encourages learners to debate, evaluate, and judge for themselves about their socio-environments. Therefore I recognise the framework as a valuable tool for non-formal education in a context of critical approaches to EfS.

The action competence approach considers knowledge to be an important precondition for the development of abilities leading into action
and to adjust to the way people interact with their environment (Bjarne Bruun Jensen, 2002). The action competence framework proposes that knowledge is created through an integration of scientific, social, cultural, historical views and information exploring a variety of forms of knowing. It is also created through a dialogic process between a learner and a teacher or more capable peer. The learner creates, seeks and uses the knowledge, while the teacher supports students in this endeavour by providing a range of contexts and opportunities to learn (Eames et al., 2010b). This teacher-learner interaction also integrates Vygotsky’s explanation of the interaction between peers, i.e. transmission and learning through the interaction between less capable and the more capable peers (Chaiklin, 2003). Considering the non-formal education context of this educative experience, I disagree with the connotations of “less capable” and “more capable” peers. I prefer to understand the learning interactions to be between peers of different qualities of knowledge. These qualities are related to the different life experiences and background of each individual. The AC concept of knowledge being created connects with and contributes to my constructivist understanding of knowledge.

3.4.4 Constructivism

Knowledge is human property. The nature of knowledge is not passive but active. That is, the human mind activates sensed data in some form of abstractions or concepts. That means that, as human beings, we do not find or discover knowledge, but we create it in light of new experiences. Clearly we do not construct the knowledge in isolation; there is an inevitable historical and sociocultural dimension that informs knowledge within a conceptual framework of shared understanding, habits, practices, language and so forth (Schwandt, 2007a).

The MAYI participants learned from their individual experiences. Including me as participant researcher, we constructed our knowledge based on our own ideas or meaning of concepts or events, based on previous and current experiences. We certainly had a shared exposure to the same events and concepts at the same time and in the same environment, and yet
our conclusions were generated individually and differently from each other. As Bruner (1961: cited in Sullivan, 2009) argued, the more we explored questions, ideas and experiences, the more the information made sense and was valued. Furthermore, knowledge is not static, but as Piaget (1928: cited in Sullivan, 2009) envisaged it, it is a process of assimilation that develops in each individual an upward spiral in her or his ability to understand more and more levels of information.

This understanding of the process of knowledge allows an interpretation element; this subjectivity, instead of being a flaw, is considered a powerful feature of interpretive research. With the used methods (e.g. prolonged participant observation, emergent analysis and thick description) there is the possibility to construct insightful understandings that shape, and are shaped by the understanding of the participant’s interactions. Consequently, this thesis aims to produce practical knowledge of the complexity, context and dynamics of the teaching and learning that occurred during and after the MAYI (Taylor, 2014).

### 3.4.5 The values of this research

To conclude this epistemological section, I would like to be transparent about my values and commitments. Being a participant researcher during the MAYI brings a value-laden perspective. This thesis is based on an interpretive study that brings a subjective element to the analysis; this is considered a strength, and not a flaw. In order for the reader to understand the strengths of my subjectivity, the following are the values that inform my participation as a researcher, and which were explained to my fellow participants during the educative experience.

- I am committed to respect diversity in human cultures, environments, ideologies and generation of validated knowledge.
- My main commitment to knowledge is the development of critical thinking in considering human activities in connection with society and ecosystems.
• I am interested in observing individuals when taking action in a society that is connected and affecting ecosystems through actions, which in turn affects society.
• I am interconnected with every other living creature in this world; therefore I strive to conduct, and am strongly committed to, ethical research.
• As part of an interconnected society, I understand that I influence and am influenced by others in the research process. This includes my Mexican co-participants during the MAYI experience and the academic community I am part of in Mexico and Australia.
• I am committed to democratic societies. I acknowledge that I live in two diverse, progressive and globalized Western societies dominated by a language that values the objective over the subjective.
• As a person, I take an active stand to be part of a society in defence of human rights, free will and action against our current environmental problems.

3.5 Case Study Research

3.5.1 Locating Case Study in Qualitative Research

This thesis is the product of a qualitative study. A qualitative analysis is a “non-numerical examination and interpretation of observations to find meanings and patterns of relationships” (Babbie, 2010). Qualitative research is contrasted with quantitative, which relies on numerical data analysed using statistical or other mathematical tools. Some qualitative analysis can incorporate quantitative methods of data collection, or have a full mixed methodology bringing the advantages of both approaches to research. In any case these approaches show substantial flexibility in their research design (Babbie, 2010; Carter & Little, 2007; Robson, 2011). This research mostly relied on text and audio, but considered some of the numerical data after the first stages of analysis.

This study considers a real world situation. In qualitative research, there are three influential flexible methodologies in design commonly used
for real world studies: case studies, ethnographic studies and grounded theory studies. Grounded theory studies are studies with a main concern to develop theory of a particular situation. The theory is “grounded” or derived from the study itself. As I will explain later in section 3.5.5, this type of analysis is inductive. Popular in applied settings such as health-related contexts, interviews are commonly used, but other methods of data collection are not excluded. Ethnographic studies focus on the description and interpretation of the culture and social structure of a social group. And finally, case study research focuses on a case in its own right. It takes the case’s context into account and it typically involves multiple methods of data collection. Both qualitative and quantitative data can be integrated, but qualitative data is almost invariably collected. In the end, the type of data collected is a result of the data sources (Robson, 2011; Yin, 2009).

The case study methodology is located within qualitative field research and different from a survey or experimental research. This case study is especially appropriate to understand attitudes and behaviours within their natural settings as in contrast with surveys or experiments. In a field study the role of the researcher is fundamental for the results, as they can play many roles including participation and intervention (see 3.8) (Babbie, 2010).

In summary, this study is about a real-life case, the study was conducted having a presence and participating in the field while observing and interacting with other participants. As noted by Miles and Huberman (1994), the research is concentrated on naturally occurring events in natural settings, so as to obtain a detailed picture of real life situations.

3.5.2 Case Study Methodology

Case study is a methodology used in a diversity of disciplines. There is a strong thread of case studies in the health sciences. In this area, case study is a “descriptive research that involves in-depth observation of one or more individuals or cases. Case studies are based on the premise that in-depth examination of one individual can result in meaningful information
about many individuals” (Sullivan, 2009b, p. 65). In education, it is understood as an in-depth study with one or more bounded units or systems (Sullivan, 2009a).

In his classic work, Yin (2003, 2014) identifies a twofold definition of case study. On one hand he focuses the first part on the scope of a real world case with such an understanding that brings important contextual conditions relevant:

A case study is an empirical inquiry that investigates a contemporary phenomenon in-depth and within its real-world context especially when the boundaries between phenomenon and context may not be clearly evident (Yin, 2014, p. 16)

The second part of the definition covers the scope and features of a case study covering the design logic, the data collection and approaches to analysing the data:

A case study inquiry copes with a technically distinctive situation in which there will be many more variables of interest than data points. It relies in multiple sources of evidence and it benefits from the prior development of theoretical propositions to guide data collection and analysis (Yin, 2014, p. 18)

In summary, case study is a qualitative inquiry about a selected phenomenon that is observed during fieldwork participating, and prefers to ask open questions to understand the meaning of human action. The analysis of the phenomena is considered highly connected to its context.

3.5.3 Interpretive Paradigm in Environmental Educational Research

Case studies are a trans-paradigmatic and transdisciplinary heuristic methodology that describes a phenomena according to the collected evidence regardless of the research paradigm or discipline (VanWynsberge & Khan, 2008). Case studies are a methodology that can follow different epistemological angles. It means that with a case study inquiry, different epistemological approaches to reality can be taken. For instance a realism doctrine understands a single reality that is independent from the observer’s experience. In opposition the relativism approach denies universal truths and acknowledges the creation of multiple created
meanings that are dependent of the experience of each observer (Schwandt, 2007b; Yin, 2014).

This study is constructed with an interpretive paradigm acknowledging the relative approach where different experiences can create different meanings to each person. A paradigm, as Patton (1975 in Robottom & Hart, 1993) defines it is:

A paradigm is a worldview, a general perspective, a way of breaking down the complexity of the real world... embedded in the socialization of adherents and practitioners telling them what is important, what is legitimate, what is reasonable... (Patton, 1975, p.15)

Various paradigms in environmental education have been identified by Robottom and Hart (1993). **Positivism** is the dominant paradigm in scientific research characterised as naive realist ontology (the nature of reality), believing that an exterior reality exist, and the scientific research or person researching, can discover the one “true” phenomenon of reality in its own nature; this phenomenon can be predicted and controlled. **Post positivism**, which is critical of the previous, understands the approach to reality, articulated in natural laws, can only be incomplete. As positivism, it still aims for prediction and control and still attempts to produce knowledge from experts based on a neutral stance. **Critical theory** is an ideologically oriented inquiry. It develops analytical postures towards arguments and procedures and languages using a lens related to issues of power and control in relationships with an emancipatory interest and an aim to construct action to improve the human experience. In educational research there is an advocacy for sharp critique towards the dominant practices; accordingly, the dominant traditions creating knowledge establishing distance through the assumptions (such as statistical measures and its interpretations) within a system of social values and interests. **Interpretivism** is part of the critical discourses of positivism (or anti-positivism). Philosophers with a constructivist or interpretivist approach convey entirely different assumptions of the world that reflect a relativist ontology. In this way, reality can only be understood within the mental framework constructed by the people who are doing the experiencing. This reality is not independent
but socially constructed and can have multiple meanings. Knowledge is subjective, and a reconstruction of intersubjective meanings; it is a dialogic exchange between the inquirer and her/his environment. Ultimate truth cannot be achieved, as knowledge is complex and ever changing. Through interpretation, the method reveals its hermeneutic (or interpretive) quality, and individual constructions are evoked and refined, then compared and contrasted dialectically to generate new constructions (Guba, 1990 in Robottom & Hart, 1993). This paradigm sustains its understanding of reality as embedded in a practice within a context based on interactive, field-based inductive methodologies. Interpretivism is not looking for a social transformation (as the critical paradigm does), but seeks the participants’ perspectives and meanings, and aims to construct holistic patterns or influence (Geen, 1990 in Robottom & Hart, 1993). In summary, in this study I adopted an interpretive paradigm, which seeks to influence the non-formal field education educative efforts.

### 3.5.4 Possible generalizations from case studies

The case study methodology has long been criticized for having little or no generalizability value. This is true of statistical generalizations, the way the dominant positivistic paradigm in science predicts and controls. This method of generalizing is commonly used when using surveys, analysing archival data such as population behavioural trends, or in political polls (Yin, 2014).

As argued by Yin (2012, p. 18), case studies use analytical generalization, which depends on “using a study’s theoretical framework to establish a logic that might be applicable to other situations”. In case studies, the theoretical or research propositions form the groundwork, and generalizations emerge from the case findings. The single case of the study does not have the value of one sample (as experimental research) or an individual (as the survey research); rather it is an opportunity to shed some empirical light about some theoretical concepts or principles. New generalizations arise from an analytical generalization, based either on the case study’s corroboration, on the modification, rejection or advancement of
theoretical concepts, or on the addition of new concepts that result from the case analysis (Yin, 2012, 2014).

Using the three phases of this study, and its research propositions, this analysis provides ground to generalize to other situations on the basis of analytic claims (see 3.6.1.1). That is, future works in environmental education can integrate the analysis of this research into similar or relevant cases where the action competence research framework or the insights of the research can be used.

### 3.5.5 Strategies to analyse case study evidence

In order to analyse the data collected from the field, there are four general strategies proposed by Yin (2014). They are not intended to prevent any additional strategies from the case study researcher, but to provide a baseline. In addition, they can be used in combination, as they are not mutually exclusive.

The first strategy is “relying on theoretical propositions”. The propositions impact the way the data collection is held, and helps to organize the entire analysis pointing to relevant contextual conditions as well as the explanations to be examined. “Working the data ground up” is the second strategy, which employs an inductive process. Grounded theory has developed this strategy extensively; the procedure is to assign various kinds of codes to the data. Each of these codes represents an abstraction of the data and could even transform into a concept. Thirdly, we can analyse the data by “developing a case description,” where the case is organized according to some descriptive framework. This is particularly useful if there are no theoretical propositions previous to the collection of data, or no useful concepts are drawn from the data. Therefore this can work as an alternative to the first two strategies, although they are not mutually exclusive. Finally, the “examination of plausible explanations” generally works in combination with the previous three. Consequently, the production of rival hypotheses might occur after different theoretical propositions; a ground-up analysis could produce rival inductive frameworks; or a case study could produce
alternative descriptions of the case (Yin, 2003, 2014). The strategies used for
the case study of this research will be described in the data management
section of this chapter (see 3.9).

3.5.6 Validity in case study methodology

In case study methodology, four tests are considered to be relevant for
the quality of research and are common to social science methods. First,
construct validity identifies the operational measures. The possible tactics
to address it are showing how findings come from the collected data and by
having multiple sources of evidence. Another tactic is the review of the draft
of the study by key informants or participants. Secondly, internal validity is
mainly used for explanatory case studies and seeks to establish causal
relationships. The possible tactics are concerned mainly with the analysis,
and relate to building explanations, identifying and matching patterns,
using rival explanations and logic models. Finally, external validity
determines whether the study can be generalizable or not. This relates
directly to the use of analytic generalizations and the use of theory in single
case studies during the research design (Yin, 2014).

3.6 The Unit of Analysis

3.6.1 Defining the case

The case study for this research is the Mexico Alaska Youth
Interchange (MAYI). MAYI was a binational comparative project involving
students from two forest communities in Mexico and one from the north
coast of Alaska, United States. MAYI was a field educative experience with
a constructivist approach and the development of multiple pedagogic
strategies. It was a cultural interchange with a strong focus on the
promotion of critical thinking about sustainable local management. The lead
researchers developed the interchange with a deep understanding of the
values and skills that would have to be transmitted (Barraza & Bodenhorn,
2012).
The three communities were selected as they shared the following characteristics:

- Indigenous communities
- Communal organization
- Each community has the responsibility and the right to develop their natural resource management plan
- Similar political context

According to the lead researchers (B. Bodenhorn, 2007; Tytler et al., 2010), the goals of the MAYI project were to promote young potential scientists with diverse learning opportunities to look beyond their local knowledge, introduce the participants to a variety of scientific approaches, provide them with practical training in qualitative and quantitative research methods, and establish international links between young Indigenous people. Moreover, it aimed to promote a greater appreciation of the special qualities of their own communities among them.

3.6.1.1 Analytic phases of the case study

This research is focused on how this educative experience promoted action in participating Mexican students. Consequently, I was interested in the continuity of the experience created by the participant’s actions after the MAYI. Ultimately, I focused on the way participants transmitted or communicated their messages about the MAYI experience to others, and how where they related to the action competence framework aspects. The analysis of the case study was conducted in three phases. The first phase analysed the experience within an action-competence framework and focused on the actions promoted by the interchange. The second phase continued the observations of the interchange once the students came back to their communities and showed continuity in their learning. This included observations about the influence to the students coming from the community. Finally, the third phase explored the nature of the transmission of messages about their experience, knowledge, reflections, connections,
actions and visions; and to identify, to a certain degree, if the MAYI participants influenced their friends and family.

### 3.6.2 Bounding the Case Study

#### 3.6.2.1 MAYI communities

According to official 2010 statistics, San Juan Nuevo Parangaricutiro is located in the northwest region of the state of Michoacán, Mexico. The indigenous people primarily speak the *Purépecha* (Tarasco) language, with 85% of people over 5 speaking it. It is predominantly an agrarian community with around 18,834 inhabitants and an economy based on silviculture, with a production of wood and rosin. Its forestry business is community-based and it is well recognized for its sustainable management by the Forest Stewardship Council (international forest management certifier organization) and the Smart Wood Program (international forestry certification program run by the Rainforest Alliance). The community also manages an ecotourism business section. The community is the social owner of the property, which is divided among around 1230 *comuneros*. In terms of education, around 73% of the population over 15 has completed elementary education, but only 11.6% have accomplished middle high school, while 5.3% has an undergraduate degree. The group of MAYI participants was between 15-24 years old, a group range in the region with a 23.5% attendance to school rate (Guzmán & Castillo, 2003; INEGI, 2011; SmartWood Program, 2002a).

Ixtlan de Juarez is the largest centre in its municipality. It is located in the northern mountain range of the state of Oaxaca. The indigenous people primarily speak the *Zapoteco* language, with 97% of people over 5 speaking it. It is predominantly an agricultural community with 7,674 inhabitants, and an economy also based on the forestry industry and the production of wood and wood products. The Forest Stewardship Council has repeatedly certified the community through the Smart Wood Program after a sustainable management evaluation. They also have a world-renown communal ecotourism enterprise. There is no private property in this
community and the ownership is fully communal. There are 384 “comuneros” who make all legal decisions about the land. In terms of education, around 70% of the population over 15 has attained elementary education, while 15.9% have completed high school and 7.7% have an undergraduate degree. Local MAYI participants were between 15-24 with a 40.7% attendance to school rate (Comisión Nacional para el Desarrollo de los Pueblos Indígenas, 2005; Guzmán & Castillo, 2003; INEGI, 2011; SmartWood Program, 2002b).

Barrow is the largest population centre and the County Seat for the North Slope Borough, which is in the northern region of Alaska, USA. It is the 11th northernmost community in the world (and the first in the USA). The indigenous people primarily speak the Inupiaq language, with about 35% of censed people speaking it at home. However, 61% are of Inupiaq-Eskimo heritage. The employed population mostly works for the borough (46%) (local government) or the school district (19%), but many residents who work full and part-time continue with subsistence activities such as hunting, fishing and whaling, which remain very important to the local community. In terms of education, around 13.3% of the indigenous population over 25 attained elementary education and 48% graduated high school. 23% had some college or graduate schooling, while only 5% have a bachelor’s degree (City of Barrow, 2014; North Slope Borough, 2010; U.S. Census Bureau, 2000).

3.6.2.2 The MAYI Case Study participants

This international interchange was an enormous effort to coordinate a large number of activities in two countries. It was possible with the combined efforts of many individuals and partner organizations. This section is limited to the senior researchers and the Mexican high school and university students who participated as learners as they are the focus of this case study.

The senior researchers were Dr Barbara Bodenhorn and Dr Laura Barraza. The participant students were 16- to 20-year-old members from
Indigenous Mexican and Alaskan communities. My field participation in this case study occurred during the last interchange in 2011, when eight students from Ixtlan de Juarez, Oaxaca and six from San Juan Nuevo Parangaricutiro, Michoacán travelled to the arctic community (14 participant students altogether). All of them were studying in public schools. In the case of Oaxaca, four students were from Colegio de Estudios Científicos y Tecnológicos del Estado de Oaxaca (CECYTE) high school, and four from Universidad Sierra de Juárez (USJ) university. In the case of Michoacán, two participants were doing an undergraduate degree at a state university Universidad Michoacana de San Nicolás de Hidalgo, and four were attending the Colegio de Bachilleres high school.

There were three cohorts of Mexican participants. Cohort 1 (C1) travelled to Alaska with the pilot project in 2006, Cohort 2 (C2) travelled in 2009, and Cohort 3 (C3) participated in the interchange in 2011. Some of the C1 and C2 students were invited to return to Alaska for C2 and C3. Some had improved English skills and with their previous experience, they were asked to perform a role of connection with the new students. This thesis is focused on the experience of 8 students’ selected from all three cohorts.

### 3.6.2.3 Chronology of the case

The idea for this project emerged after a long field research experience in Mexico and Alaska by Dr Laura Barraza and Dr Barbara Bodenhorn. A series of observations in San Juan Nuevo Parangaricutiro in Michoacán and in Ixtlán de Juarez, Oaxaca, Mexico, provided the elements to create an educative experience based on a field expedition between the communities Two main findings attracted their attention (Barraza, Ruiz Mayen, Bodenhorn, & Ceja Adame, 2004):

- In the Mexican communities there is no evidence of students’ being interested about climatic changes as part of global processes.
- Young people ignore important aspects of local history and environmental knowledge that are based in scientific and traditional knowledge kept by community elders.
The interchange between the two communities in Mexico and the connections made by the organisers created an optimal situation to establish an international exchange program. With this background, the researchers designed and started MAYI as a pilot project in 2006, with a group of high school students from the 3 communities and a teacher from each Mexican community, and together they visited Barrow in the North Slope region of Alaska for one month. They travelled for two more weeks in Ixtlan de Juarez and for two more in San Juan Nuevo. This project was not part of a formal school curriculum, yet still got full support from the local upper secondary education and high education centres. After the pilot interchange, the project won the full financial support from the U.S. federal agency National Science Foundation (NSF), and the project took shape over the next two years as follows (B. Bodenhorn, 2014):

- 2006: Pilot project – Mexican students travelled to Alaska.
- 2008: the two Mexican communities were hosts for a group of Alaskan youths.
- 2009: a different group of Mexican high school students travelled to Alaska. This time some university students also joined the interchange and some students from the first interchange participated as a liaison with the new travellers.
- 2010: Ixtlan de Juarez was the host community, welcoming the group from San Juan Nuevo and Alaska.
- 2011: due to the end of the main financial support, this was the last MAYI. Again university students, who have already participated in the interchange, partook as a liaison with the new travellers.

3.7 Three Phases of Analysis: Research Propositions

The Mexico Alaska Youth interchange was a unique case of environmental education. This thesis proposes to observe and analyse this case with a specific focus: action competence (AC). This focus was maintained across the three phases of the analysis: the experience, its continuity and the transmission to the social network of the participants.
The following sections provide an explanation of each phase with its research propositions and the criteria used to analyse the interviews.

### 3.7.1 Action Competence and its six aspects

The conception of action competence originated in Scandinavian school research at the end of the 1990s. It unified some ideas from a democratic education to empower learners to take action. The authors of these ideas (Bjarne Bruun Jensen & Schnack, 1997; Finn Mogensen & Schnack, 2010) identified some specific components to promote an intentional and informed way of taking action. A group of researchers in New Zealand continued the exploration of pedagogies that would promote the development of action competence (Eames & Barker, 2011; Eames et al., 2010b). They developed a framework with six well-connected aspects that would promote active participation in schools in the context of a new national curriculum in the country. For the analysis of this case study, I used the six aspects proposed by Eames et al. (2010b) as the deductive elements for the analysis. Table 2-1 below is an adaptation by Arthur (2011) that summarizes each aspect.

**Table 2-1: Aspects of Action Competence used in New Zealand study (Arthur (2011), adapted from Eames et al. (2010b))**

<table>
<thead>
<tr>
<th>Aspect of Action Competence</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience</td>
<td>To be action competent, a learner should have a range of experiences to develop their understanding, commitment and engagement with sustainability issues. This includes learning in and about the environment that the issue is situated in to connect the learner to it, and engage their motivation and passion as in the motto ‘head, hearts and hands’ or ‘think, feel, act’. This component develops the ‘heart/feel’ aspect.</td>
</tr>
<tr>
<td>Experience refers to a state, condition (feelings) or an event that has happened. The interpretation of this experience may be personal and/or collective.</td>
<td></td>
</tr>
</tbody>
</table>

51
| Reflection | To be action competent, a learner should know how, when and why to reflect. Learners will reflect in and on action, be critically reflective of themselves and their actions, and also of what they read and hear. Learners will also reflect on their own learning. Reflection is essential to make the connections between thinking, feeling and acting. |
| Knowledge | To be action competent, a learner should develop knowledge and understanding of sustainability issues as they are found in everyday life, and the impact they have on all living things. Therefore, knowledge should be developed in an integrated approach. It should include finding and analysing factual/scientific information, social, cultural and historical views and exploring multiple ways of knowing. It includes the learner knowing themselves and others. Learners should be developing their ability to use such information and findings to inform decisions and actions that lead to a more sustainable future. |
| Vision for a sustainable future | To be action competent, a learner should develop a vision for a sustainable future. This involves understanding sustainability and exploring alternatives for change |
| Action-taking for sustainability | To be action competent, a learner should develop an ability to plan and a willingness to take effective action for sustainability. The action could be direct or indirect and should be aimed at addressing the cause of a sustainability issue. |
Connectedness
It is the interconnectedness between people and all aspects of the environment: this includes making connections between thinking, feeling and acting (head, hearts, and hands).

To be action competent, a learner should understand that they are connected to other people and their environment. This connection should be evident in their attitudes and values, which in turn are linked to their behaviour. It includes understanding the interdependence of environment and societal aspects such as culture and social needs. It is the connectedness that leads to relevance, enthusiasm and interest because learning is participative.

3.7.2 The Continuity of the Experience

For this analytical phase I choose a particularly relevant element in regards to the action competence: experience. Lived experiences naturally involve an essential time element. This property of experiences in time also implies the search for future practices by the experiencer and generates the concept of experience continuum.

John Dewey (originally published in 1938) proposed the principle of experience continuum. According to him, we discriminate the valuable experiences in our life depending on the subjective value each individual gives to them. The principle of continuity is based on the quality of the present experience influencing the quality of further experiences. As experiencers we generally judge agreeable experiences positively, and non-agreeable ones negatively. Even if this is a simplification, it was a useful principle to analyse the interviews with MAYI participants. Table 2-2 presents the working definition used for this experience continuum proposition (Dewey, 1998):

<table>
<thead>
<tr>
<th>Experience elements</th>
<th>Working definition in the hermeneutic unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience agreeableness</td>
<td>The continuity of education depends on the agreeableness of an experience</td>
</tr>
<tr>
<td>Experience disagreeableness</td>
<td>The continuity of education depends on the disagreeableness of an experience</td>
</tr>
</tbody>
</table>

Table 2-2. Experience elements
3.7.3 Transmission of Action Competence

My intention was to investigate the quality of transmission from the participating MAYI students to their friends and family after the field experience. The transmission of messages is understood as the students extending their experience through communicating their memories, knowledge, and intentions to their closest social connections. I conducted semi-structured interviews with 8 referred friends and family, with whom the students talked about their experience (appendix 1). This phase is focused in Ixtlan de Juarez, Oaxaca, where, as discussed previously, the possibilities to conduct the interviews were favourable.

The answers from the interviews were codified in a hermeneutic unit using the Atlas.ti software. The analysis in the HU focused on codified the topics included in the messages and create the relationships with the action competence aspects of the framework (Eames et al., 2010b). Additionally, observations about the emotional expressions within the messages were recorded. The following sections present the results of this categorization in tables.

3.8 My participation as researcher in the 2011 MAYI

3.8.1 Research during the field educative experience

The Mexico-Alaska Youth Interchange came to an end in its 6th year of activity (2011). From June 15 to August 15, the student participants, the research staff and me travelled to Alaska to the field educative experience. My involvement during the interchange was varied. I helped organise the logistics of the trip, for instance the US visa process in Mexico City. I also assisted the participants with flights and travel issues, for example when one of the Mexican participants lost his passport en route from Anchorage to Fairbanks. We organised a one-day trip back to the Mexican embassy in Anchorage to obtain a new passport. Additionally, I helped with group dynamics, organising meals and scheduling activities, trying to meet the group’s diverse needs.

54
My involvement in the content of the program consisted of helping the students to find connections between the way science was managed in Mexico and in their national context. I was also helping with interpreting from English to Spanish for the Mexican students. I was invited to give a talk with two purposes. The first one was to explain and clarify the study’s details and its ethical considerations. The second one was to give a different example of issues in natural resource management from my previous professional experience. The example was about fisheries and sea turtle conservation in Baja California Sur, Mexico. With this intervention from my part, I introduced a different Mexican example, which provided context for the well-analysed examples of sustainability in Mexican forests and the arctic communities the students were part of.

3.8.2 Research in the communities

From September through October I visited the two Mexican communities. Firstly I went to Ixtlan de Juarez, located in the northern mountain range in the state of Oaxaca. With the help of Dr Bodenhorn (MAYI co-organiser), I introduced myself to some key community members related to the interchange. I introduced my research and activities to the Municipal Councillor of Education and the Municipal President, CECYTE’s director, and to the University of the Sierra Juarez (USJ) Vice-Chancellor. To the communal organization sector, I presented my research and activities to the president of the “common goods” (i.e. traditional government and collective property) and the father of two participants who was an important member of the community, and participated with me as an interviewee.

After this formal presentation of my research purpose, I started visiting as many MAYI student participants as possible. I audio recorded most of the interviews with the participants and their families and friends. Some interviews, however, were not recorded because I did not consider it advisable, either because I felt it was disrespectful at the time, because I perceived some cautiousness due to my presence, or because I noted an initial objection to record.
Secondly, I visited the state of Michoacán. The situation there had to be managed differently. Most of the 2006-2010 participants were studying in the capital city of Morelia. Some interviews were conducted in a public place in that city. Eventually, I travelled to San JuanNuevo Parangaricutiro, where I was warned about a stressful situation the community and communal organization was going through. The communal forest enterprise was going through an audit, which caused stress among the members. This presented a tense context for the field research in this community. In addition, there was a fragile security state caused by the drug dealing mafias in the whole state (and country). For this reason I only took notes of my observations after the visits to the families. In that situation, the goal of the visit in that community was no longer the formal interviews and data recording, as I deemed it not to be the safest strategy. Instead, my role turned into creating links with the families of the participants to whom I was formally introduced. In addition I provided some assistance and support to the participants during the required community presentation about their Alaska trip, and we started to organise it.

After MAYI, I created a Facebook group (https://www.facebook.com/groups/235025956541564/) where I kept in touch with MAYI participants from different years. Some of the participant interventions demonstrated their continuous interest in some of the interchange topics. This was an important tool to be created, as this was the most efficient way to maintain a connection with them. Through the Facebook group I have been able to stay in touch with the participants and to ask them to review the results of this study.

### 3.8.3 Ethical Issues

Every study that involves humans should be conducted with integrity and in a high ethical responsible approach. Deakin University ensures this, with a Human Research Ethics Committee (HREC) based on the Australian Code for the Responsible Conduct of Research and the National Statement on Ethical Conduct in Human Research. With the support of my principal supervisor, we invested a fair amount of time and effort specifically in
providing an informed participation and asking for consent; in the same manner, we guarantee the protection of sensitive data to the participants before participating. An informed consent is about the right of individuals to determine for themselves their willingness to participate in the research (Ruane, 2005). In this section I would like to clarify the process I used to obtain an informed consent from the MAYI students and their relatives and friends.

A Plain Language Statement format was used to ask for consent. In the first stage, we had a meeting with the students and their parents to orally explain in plain language what it was required for the purpose of this research. Then I gave them a printed Language Statement consent form and asked for their consent signature. As some of the participants were minors we explained to the parents all the details of the study and how their children would be involved. We explained what kind of participation was asked from them (interviews and image data collection) and how important it was for their participation to be voluntary. In the second stage in Alaska, a talk was organised where I further described my participation as researcher in detail.

During this talk, the senior researchers and I explained in detail every aspect of the study, from the theoretical framework to the methods to be used, the kind of questions to be asked in the interviews, the use of video and audio recording and the use of pictures. Subsequently, we guarantee the security of information as the individual data protection rights standards for Deakin University. Every individual’s information is securely saved, and will be used only for the purpose of this research. This includes personal information and images of the participants, which, in accordance with them, will only be used for communication and outreach of this project (e.g. presentations). On this matter we also support the security process sustained by the Mexican Federal law for personal data protection in possession of a private person (DOF, 2010).

All these clarifications were important as I was capturing many MAYI moments in my field notes plus audio, video recording and pictures.
Therefore, participants were always aware of my role as an observer and of the purpose of my actions to collect data. During my explanation, I committed myself to sharing all the information and writings of the research with the participants. This commitment was also made to their families and the community representatives when I was visiting Oaxaca and Michoacán.

In other ethical issues, there were no risks for participants as a result of their participation in this research. Presenting the findings and outcomes to the community its considered beneficial to the generation of local knowledge in terms of how field educative experiences can promote active students in the communities. It also has the capacity to generate environmental education proposals in search for action competent students.

The participation in this research during the MAYI prompted individual self-reflection. The participants were clearly enabled to use their freedom of choice as they were asked to participate in a research; their actual participation advanced their scientific, critical, oral and communication skills as they reflected on themselves as being part of a research process. This advance in their skills is rather significant as the content in the MAYI lectures was the process of knowledge generation within science and traditional knowledge.

The research was conducted in the native language of participants and most researchers (Spanish). In conducting the research, I behave in a respectful way to the local believes, and in awareness of gender equality, respecting individuals, their friends and family desires, and community customs and traditions. Information about third parties (relatives and friends) was collected from students, as we were looking for their personal connections in a social network. Every third party was interviewed once I had the student’s consent. In addition, I asked the students to explain the purpose of the research to their peers previous to the interview. Then, at the time of the interview, a full explanation of the project and objectives was provided.
3.8.4 My Role as a Participant Researcher

During the fieldwork I was a *participant-as-observer*, who formed relations and participated in the activities. Nevertheless, I was very clear about my intention to be an observer and about the goals of my study (L. Anderson, 2008). In terms of researcher membership, I was not an insider, as I do not belong to any of the two Mexican communities I visited, or to the group of students who were selected for the MAYI. On the other hand, I was not an outsider either, as I was participating in the activities and collaborating with the work to be done by the students. According to Dwyer and Buckle (2009, p. 61), I occupied the “space between,” and had the advantage of two perspectives to understand the experience more deeply.

My relationship with the MAYI participants was unique in the sense of the role I was performing. In the course of the field experience I became a facilitator, teacher, translator and companion. During the several discussions in class, I was able to translate scientific concepts into Spanish and their explanation. I delivered some ideas and connections with a different point of view from the main researchers and speakers, adding to the diversity of knowledge. I was able to contribute mainly due to my background and personal use of language, which was focused on creating simple connections through juvenile and fresh expressions. My presence during the interchange brought another example of a different Mexican context (my own experience). I provided the students with language that could be consider colloquial, not only during the formal lectures (i.e. using informal language to explain concepts), but also during informal and everyday interactions with the Alaskan students and their US culture (i.e. translating everyday conversations, explaining cultural differences). These are examples of my unique situation and my role like an insider researcher.

The 2011 MAYI group already knew each other from the previous interchange held in Oaxaca in 2010. In my relationship with them I earned their trust through different stages. At the beginning of the trip the participants were open to listening to my instructions about logistics. Then some communication difficulties were experienced during my first attempt
to explain my study and the purpose of my participation. When asking for some of the participants consent by way of their signature, I experienced some scepticism. My reading of this reaction is contextualized in a history of abuses of Indigenous communities and their traditional knowledge by foreigners, which many times was claimed to be “for scientific purposes”. This situation and my authority role exemplify the researcher’s outsider role.

Fortunately, there were two other opportunities to explain in detail what my research was about and the kind of participation I required (as mentioned before). These helped to dispel the distrust created by the request for signatures on a consent form. Halfway through the interchange I asked to talk with the students individually in formal interviews. The perception of my role changed with the support and help I offered to the students and the time spent in informal conversations with them.

After the trip, when participants returned to their communities, my role reverted to that of an outsider researcher. I was introduced to the local authorities, the representatives of the education institutions and the students’ friends and relatives by Dr Bodenhorn, who was well known and trusted in the community. This established the connection and enabled me to be listened to and to an extent trusted by families and authorities in Oaxaca. My study continued with the aid of the participant students who helped me contact their friends and family. At the other community, in Michoacán, I was in contact with a well-known representative of the communal forest enterprise who was strongly supportive of the interchange participants. He introduced me to the students’ parents, and allowed me to open a door with the families, who listened to me and trusted my presence.

This is the process through which I accessed the specific knowledge for my study. Using the ideas from Dwyer and Buckle (2009), as a researcher I didn’t feel separated from the study. The words and intentions expressed by the participants were clear to me and continued to be during my analytical phase. There was no need to distance myself from them or from their community. This would only have put me in a less favourable
situation as researcher. And without the distance, I acknowledge that my personhood effected in the analysis and the analysis effected in my personhood.

3.9 Analysing the Case Study Evidence

3.9.1 Data Collection

During my participation in the MAYI in 2011, I used the following main tools to capture data in Alaska and in the Mexican communities:

- Recorded interviews
- Field notes

The data was organized chronologically and stored on the main laptop computer I was using to do the analysis. All data was kept in 4 different backup storage systems.

3.9.2 Data Analysis

The collected data is qualitative in nature and I used a computer-assisted tool, or Qualitative Data Analysis (QDA) software named Atlas.ti. This software is able to manage, code and connect the primary documents, memos and codes. This software supports text, graphic, audio and video files as primary documents (PD). The PDs collection forms the central workspace editor (or workbench), and the results of the PD analysis (i.e. the codification, findings, written memos, network views of relations) were collated in a single file, called hermeneutic unit (HU). Working at data level in the HU implied going through each interview in detail. Sections in each PD were selected to create segments, e.g. on the timeline of audio files or text passages in documents. These segments were coded and connected to form a semantic network. The following section describes the strategies employed to do this.

3.9.2.1 Strategies to analyse the data

Two out of the four general strategies proposed by Yin (2014) are used in this analysis. These are: “relying on the theoretical propositions” and
“working with data from the ground up”. These strategies to codify are also known as deductive and inductive codification.

The theoretical propositions described in the previously provided the fundamental elements for the coding, based on the three units of analysis (Aspects of Action Competence, Experience Continuum and transmission to the people). The theoretical propositions helped to generate a deductive codification (also known as top-down), or pre-designed codes, based on the research propositions or the action competence framework, and the transmission goals for this research. On the other hand, an inductive codification (or in vivo, grounded or bottom-up) worked with the data to generate emerging codes during the review of each PD. This strategy gave the possibility to suggest and form useful concepts that emerged from the data and helped individuate additional relationships (Freise, 2011; Yin, 2014). With the aid of the QDA Atlas.ti, the interviews’ audio files were directly quoted and codified deductively and inductively. The selected segments were transcribed in memos and linked to these quotations.

Two interconnected Hermeneutical Units were created. The first included the research propositions from the action competence framework and the experience continuum to define the deductive codes. In this HU, all interviews to MAYI participants (from the 2011 interchange and the previous years) were integrated. The second HU focused on the transmission of learning after returning from MAYI; including any expressions or messages related to the action competence aspects codified in the first HU (deductive) and any other unexpected expression of transmission (inductive). At this stage the interviews were only from students who have already participated in MAYI in previous years, as they had time to reflect and transmit their experiences.

Each emerging code was associated with a working definition so it was possible to use the codes as concepts. These concepts were labelled so they could be used to codify other quotations in the HU. In doing so, each code was associated with a number indicating the amount of quotations that supported that concept. The concepts were recognized by their value in
relation to the objectives of this research: the promotion of action and its social transmission.

The subsequent phase of analysis was to understand the relations among the PDs, codes and memos, and organise them in family relationships. Semantic networks were created based on the logic of each topic. In this final stage, the HU, based on the codes, memos and the networks, formed the basis to write up the findings and the emerging ideas (Freise, 2011).

3.9.3 Validity in this case study

In order to prove construct validity in this case study I present the process of how the data informs the interpretations using my participant observations and the tables and quotes with the transcripts of the interviews. In the process to achieve internal and external validity, I have also gone through the process of draft reviewing with the key participants. In the thesis I present the working definitions for each code used in this analysis and provide substantial explanations for the analytic generalizations. Furthermore, this process was double-checked by the principal supervisor of this thesis.
Chapter 4  Mexico-Alaska Youth
Interchange: Promoting action

4.1 Objective

This chapter presents the analysis of the Mexico Alaska Youth Interchange (MAYI) case study, using the action competence (AC) framework from Eames et al. (2010b). With the assistance of the Atlas.ti QDA software, interviews and observations were examined, organized, visualized and interpreted. The interpretation is conducted and organized using the six aspects of the AC framework: experience, reflections, knowledge, visions for the future, action taking and connectedness. Each aspect is recognized to have different qualities of expression; the codes within each aspect unpack the students’ personal stances and reveal a common meaning of the MAYI experience. The analysis brings a sharper understanding of the possibilities of the AC aspects after a field educative experience.

4.2 Processing the Findings

A hermeneutic unit (HU) was created with the software Atlas.ti; this HU is the construction of relational codes from structured data. The structure is formed by (Freise, 2011):

- Primary documents, in this case audio interview files
- Quotations, or sections of the interviews selected for their important content
- Codes, or referenced (i.e. tagged) pieces of text that capture examples of data to be interpreted.
- Connections, or the interrelation between the codes and the data.

The findings in this chapter are shown and discussed using tables and network maps. The maps are visual diagrams that express the HU relationships. They are representations of the codes in boxes, extracts of interviews or quotations, and lines connecting them all in a network of
ideas. A sum of codes integrates each of the AC aspects (or families in the language of Atlas.ti). Each code is substantiated by the quotations from the interviews. Finally, the lines represent the kind of relationships created during the analysis (see Figure 4.1 for a reference key). The topological arrangements of these network maps are only for visual purposes and they are not intended to represent a semantic layout.

The tables are associated with the network maps to clarify and expand the integration of each aspect in the MAYI analysis. In the rows they present a comprehensive list of codes used in the maps. Each column shows the code’s definition, its relationships with other codes and the number of associated quotes. To support the discussion, in each section, a table of examples of each AC aspect is introduced in English and Spanish. The explanations and discussions of each network map and tables appear below each figure. In the text, the names of codes are written in italics, e.g. ‘reflections of connections’, and some examples of the participant expressions are presented in a quotation style.

This analysis of the case study uses both inductive and deductive strategies (Freise, 2011; Yin, 2014). Nineteen codes are inductive (white boxes Figure 4-2), representing important ideas, thoughts and meanings originated after the interviewees’ voices that created a category related to the AC aspects. Eleven codes are deductive (blue boxes Figure 4-2). These ideas, thoughts and meanings were categorised in defined elements of the AC aspects with the interviewees’ voices inserted into them. Nevertheless, the relationship between deductive/inductive codes (11:19 ratio) shows that the analysis in the HU is strongly inductive. As discussed in the methodology, an interpretive case study analysis emerged from the available data. Case studies, such as that presented in this thesis, are based on the inductive strategy. In this way, the inductively generated codes are the means to build a theoretical understanding of this case of social phenomenon, (the educative experience) based on real life (Alasuutari, Bickman, & Brannen, 2008; Miles & Huberman, 1994).

Three MAYI cohorts are identified based on the year of participation C1 (2006), C2 (2009), and C3 (2011). Some participants went to MAYI twice.
The participants are referenced by their names, date of interview and the MAYI cohort in which they participated.

**Figure 4-1: Key to the network analysis compiled with Atlas.ti**

4.3 **An Integrated Perspective of the Six Aspects**

Figure 4-2 shows a network map with the general structure and composition of the HU. This map shows the six aspects of the AC framework arranged in the centre (Experience, Reflection, Knowledge, Visions for the future, Action Taking, Connectedness). In the language of Atlas.ti these aspects are 6 families of codes (see key in figure 4-1). The boxes around them represents the codes associated with each family. As mentioned before the codes are distinguished between inductive (white boxes) and deductive
Figure 4-2: MAYI Network map in Action competence. The central boxes represent families, or the AC aspects, under which the codes operate. The surrounding boxes are the codes used to analyse the MAYI experience.

The green lines in Figure 4-2 represent another interpretive relationship among the AC aspects. These links indicate a relation between two codes and its quality. In comparison, these relations are created deductively as the quality of the link was determined independently from a quotation. For instance the ‘Ideas, plans for action’ are a cause of ‘Thoughts, working ideas’. In this case, the relationship is theoretical, where thoughts are the working ideas of the plans for action (Waks, 2011). This other level of intricacy adds to the complex internal structure of interaction among the codes. The analytical process understood the codes as flexible units operating within the different AC aspects.
Table 4-1: The AC aspects (families) and its associated codes. Each column lists the codes for each AC aspect used for the MAYI analysis.

<table>
<thead>
<tr>
<th>Experience</th>
<th>Reflection</th>
<th>Knowledge</th>
<th>Visions for Future</th>
<th>Action Taking</th>
<th>Connectedness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotions associated with experience</td>
<td>Concepts: questioning, adapting,</td>
<td>Connections of knowledge</td>
<td>Ideas, plans for</td>
<td>Indirect actions</td>
<td>Connections of knowledge</td>
</tr>
<tr>
<td></td>
<td>developing</td>
<td>Sustainability</td>
<td>action</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experience agreeableness</td>
<td>Critical opinion</td>
<td>Bio-complexity</td>
<td>History as part of</td>
<td>Difficulties to</td>
<td>Connections of Actions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Climate change</td>
<td>Visions for the</td>
<td>participate</td>
<td></td>
</tr>
<tr>
<td>Experience continuum</td>
<td>Reflections on Experiences</td>
<td>Whale Knowledge</td>
<td>Desired or Liked</td>
<td>Democratic Ideas</td>
<td>Connections with Emotions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Climatology</td>
<td>Visions for the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experience disagreeableness</td>
<td>Experiences changing perspective</td>
<td>Ice knowledge</td>
<td>Desired or Liked</td>
<td>Participation in</td>
<td>Reflections on connections</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Visions for the</td>
<td>activities</td>
<td></td>
</tr>
<tr>
<td>Experiences changing perspective</td>
<td>Improve living conditions</td>
<td>Oceanic currents</td>
<td></td>
<td>Connections of</td>
<td>Connections with culture</td>
</tr>
<tr>
<td>Previous experiences</td>
<td>Questioning or changing ideas</td>
<td>Plagues in the woods</td>
<td></td>
<td>Actions</td>
<td></td>
</tr>
<tr>
<td>Reflections on Experiences</td>
<td>Reflections on Action</td>
<td>Concepts: questioning, adapting,</td>
<td></td>
<td>social networking</td>
<td>Connections with other experiences</td>
</tr>
<tr>
<td></td>
<td></td>
<td>developing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connections with other experiences</td>
<td>Reflections on Climate change</td>
<td>Tipping point</td>
<td></td>
<td>Preparation for</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>an action</td>
<td></td>
</tr>
<tr>
<td>Reflections on connections</td>
<td>Control taken by communities</td>
<td>Information from listening</td>
<td></td>
<td>Ideas, plans for</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>action</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Thoughts, working</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ideas</td>
<td></td>
</tr>
</tbody>
</table>

The Figure 4-2 is a network map generated by Atlas.ti, which represents the network of relations between the 6 aspects of action competence and the 30 codes used for the MAYI analysis. Through the codes, there are some intricate relationships between the AC aspects. Some of these codes are integrated in more than one aspect. For instance the code ‘reflections of connections’ belongs to both the aspect reflections and the aspect connections. When quotations, or pieces of interviews, are tagged
with this code, it means that they are interpreted as an expression of a reflection and a connection, therefore belonging to these two AC aspects. These dual expressions have created several intricate connections between the aspects of the AC. See table 4-1 for a summarised presentation of Figure 4-2.

4.4 Experience in MAYI

Experience is defined in the AC framework as: “a state, condition (feelings) or event that has happened. The interpretation of this experience may be personal and/or collective” (Eames et al., 2010b, p. 3). Figure 4-3 is a conceptual map of the MAYI analysis, representing the set of codes (boxes) classified under Experience, and under each box the quotations are represented in packets offering a summary of how the Experience aspect is composed. In this MAYI analysis, the Experience aspect is composed of 8 codes supported with 125 quotations from the interviews. Furthermore,

Table 4-2 shows some examples that illustrate the contents of each code used for the Experience aspect analysis.

Figure 4-3: Network of codes integrating the ‘Experience’ aspect
<table>
<thead>
<tr>
<th>Experience</th>
<th>Code</th>
<th>Quotation Example Spanish</th>
<th>Quotations example English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotions associated with experience</td>
<td>Barbara</td>
<td>Por supuesto una de las cosas más satisfactorias para mí, ha sido conocer a tantos jóvenes con un hambre [de conocimiento y experiencia]... no todos, conocemos los dos, algunos que no están buscando este hambre, ni la comida. Pero la mayoría y sobretodo de Ixtlán. De los jóvenes de Michoacán mucho menos. Pero algunos de ellos también, excelentes, excelentes.</td>
<td>Absolutely one of the most satisfying things for me, has been to know so many youngsters with hungry [of knowledge and experience]... not all of them, we both know, some that are not looking for this hungry nor the food. But the majority and especially from Ixtlán. Much less from Michoacán youngsters. But some of them are excellent, excellent.</td>
</tr>
<tr>
<td>Experience agreeableness</td>
<td>Fátima (note)</td>
<td>Recordaba la platica de Craig George [un investigador/presentador] con gusto. Y que le gustaban mucho los animales de los que platicaba</td>
<td>Fatima (note) She remembered the Craig George’s talk [a researcher/speaker] with joy. And that she liked the animals on his talk a lot.</td>
</tr>
<tr>
<td>Experience continuum</td>
<td>Montse</td>
<td>¿Siempre quisiste ir a la universidad? ...de ir a la universidad fíjate que no. O bueno más bien no lo concebía... era de que: tengo que ir a la escuela, jugar con mis amigos, mis papás y ya. Hasta el CECYTE, que realmente me cayo el veinte, de que... que va a ser de mi vida, que voy a hacer yo, ahora tengo a mis papás, pero a lo mejor en los años que viene: ya no. Y yo como me voy a sostener sola... Entonces fue ahí donde me cayó el veinte y decidir bien... que voy a hacer... Bueno por que para mi no</td>
<td>Did you always wanted to go to university? ...Not to the university. Or better said, I didn’t conceived it... I thought: I have to go to the school, play with my friends, my parents, and that is it. Till I was in the CECYTE [high school] when I finally [question myself]: what is it going to be of my life? What will I do? I have my parents with me at the moment, but in the following years: not any more. So, how will I support myself? Then is when I understood and take a clear decision.... Well for me it’s not right to do a career and not practice it. And so, it was clear for me that I already had</td>
</tr>
<tr>
<td>Experience disagreeable ness</td>
<td>Fátima</td>
<td>What she didn’t like was the food, but it wasn’t as important. Anyway it was an experience she could not think on something she didn’t like.</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>Lo que no le gustó fue la comida, pero no fue tan importante y de todas maneras fue una experiencia en la que no puede recordar algo que no le haya gustado.</td>
<td>---</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Experiences changing perspective</th>
<th>Aníbal</th>
<th>[If you didn’t go to MAYI] Do you think you will still be doing architecture but not as focused on sustainability? Not the same, not the same. I think if we had not gone to the interchange I would not care about it... With bio-climatic and Eco-techniques I try it to be self-sustainable and that they use [less] energy.</th>
</tr>
</thead>
<tbody>
<tr>
<td>---</td>
<td>[si no hubieras ido al intercambio] ¿Crees que te estarías dedicando a la arquitectura pero no tan enfocado a la sustentabilidad? No igual, no igual. Yo creo si no hubiéramos ido al intercambio me valieragorro... Con la bioclimática, y ecotecnicas, trato de que sea autosustentable y que ocupen [menos] energía.</td>
<td>---</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Previous experiences</th>
<th>Rodo</th>
<th>Before the first interchange, they gave us introductory talks to climate change, global warming, greenhouse effect, and things like that. Because I, personally, ignored it... because my specialty in the high school was another thing. Then, once there, talking with those specialists... it changed me completely... my way of thinking.</th>
</tr>
</thead>
<tbody>
<tr>
<td>---</td>
<td>Antes del primer intercambio como que si nos dieron pláticas introductorias a cambio climático, calentamiento global, efecto invernadero, cuestiones de esas. Por que yo en lo personal lo desconocía... por que mi especialidad dentro del bachillerato era otra cosa. Entonces una vez que llegamos ahí, hablando con ese tipo de especialistas...</td>
<td>---</td>
</tr>
<tr>
<td>Reflections on Experiences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barbara</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pues hay diferentes agendas. Para mi ... hay muchas universidades están muy interesadas en impacto. Entonces “impacto” estarás diciendo: “¿vamos a ver que paso? a través de esta otra cosa”. Pero si los impactos no aparecen en publicaciones, no cuentan como impactos. Entonces, para Laura, para mí, para ti, para todos... si estamos hablando de impacto, en la dinámica de los Estados Unidos, de México y de Inglaterra es una palabra que debes insertar en las reflexiones o en la introducción por que es un concepto que las autoridades están buscando. Yo, lo que pienso es que es muy muy muy importante insistir estas pinches gentes, que no se puede predecir los impactos. Si estamos hablando de un trabajo colaborativo, es necesario dejar la posibilidad de responder a lo que esta pasando a través del proyecto. Y esto es un ejemplo ejemplar, los dos proyectos [raíces de éxito y MAYI].... Las raíces de éxito... tenía una finalidad que fue muy responsiva a las preocupaciones locales, para generar a través de los años... nos ofrecieron más dinero por que los resultados fueron mas que esperados. No es malo para mencionar esto de las raíces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well, there are different agendas. For me... there are many universities interested in impact. Then, “impact” you are saying: “lets see what happened? Through this other thing?” But if the impacts do not appear in publications, they don’t count as impacts. Therefore for Laura, for me, for you, for everyone... if we are talking about impact, in the United States, Mexico, England dynamic, it’s a work you must insert in the reflections or the introduction, because it’s a concept that authorities are looking for. What I think is that its very very very important to insist this people, you cannot predict impacts. If we are talking about a collaborative work, it is necessary to leave the possibility to respond to what is happening throughout the project. And this is an exemplary example, the two projects [roots of success and MAYI].... The roots of success ... had a purpose that was very responsive to local concerns; and to generate through the years ... they offered more money because the results were more than expected. It’s not to mention that form roots of success. From the beginning, we have worked with both: educational and local institutions [communal government]. That has always been a collaborative process, precisely to emphasize that we recognize the knowledge of the</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
These codes display different qualities, and they are arranged in two major categories for this analysis. The first category relates to the **continuity** of the students experience. The second category is related to the internal growth of the individuals, using the concepts of **self-authorship**, and **provocative experiences** proposed by Baxter Magolda (2001) and discussed by Pizzolato (2005). The first category relates to the continuity of the field experience. Table 4-3 shows the codes that are grouped under this idea. Students had a great appreciation of the MAYI field educative experience for different reasons. Nevertheless, the analysis found two elementary ways of assessing the experience in relation to the enjoyableness of the experience. That is, the quotations exhibit either an agreeable or disagreeable comment. To expand the discussion we incorporated John Dewey’s principle of experience continuum.
As the next Chapter 5 will show in more detail, the concept of continuity of the educative experience is highly important when the focus is to promote action in students. In order to understand the importance of time, I observed a few ‘previous experiences,’ which gave context to the participation in MAYI. For instance, Montse (C1, C3) talked about an environmental camp she participated in during her primary education, or Rodo (C1, C2), who was not familiar with environmental issues, was familiar with a few ideas like global warming (see Table 4-2). John Dewey’s (1998) principle of ‘experience continuum’ incorporates the idea of students having agreeable or disagreeable experiences, and these would determine their search for further educative experiences. In our case study analysis, as Table 4-3 shows, these two codes were not highly quoted. The continuity of action in the students once they were back in their communities appeared to be more dependent on the family context, their social support and the opportunities the students found to act after their trip to Alaska (see Table 4-2 for an example).

Table 4-3: The AC aspect ‘Experience’. The table shows the continuity codes with its working definition, the relationship with other codes, and the number of quotations.

<table>
<thead>
<tr>
<th>Code</th>
<th>Working Definition in the Hermeneutic unit (Atlas.ti)</th>
<th>Related codes</th>
<th>Number of quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience continuum</td>
<td>The search for other experiences similar or complementary to the lived one. E.g. Previous experiences that created the intention to participate in MAYI. Or Experiences held after MAYI with similar learning intentions. E.g. the intention to keep on studying or preparing oneself.</td>
<td>Is INFLUENCED by: Experience agreeableness Experience disagreeableness Emotions associated to decisions Previous experiences</td>
<td>24</td>
</tr>
<tr>
<td>Previous experiences</td>
<td>The mention of previous experiences that gives context in order to participate in MAYI. Its related to the Experience continuum as this experience, might have some influence on acting towards participating in MAYI</td>
<td>INFLUENCES experience continuum</td>
<td>7</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------</td>
<td>---</td>
</tr>
<tr>
<td>Experience disagreeableness</td>
<td>John Dewey's idea of quality in education includes the agreeableness or disagreeableness felt during the experience. This is directly related to the Experience continuum concept.</td>
<td>NEEDS emotions involved in decisions INFLUENCES experience continuum IS OPPOSED TO experience agreeableness</td>
<td>6</td>
</tr>
<tr>
<td>Experience agreeableness</td>
<td>John Dewey's idea of quality in education includes the agreeableness or disagreeableness felt during the experience. This is directly related to the Experience continuum concept.</td>
<td>NEEDS Emotions involved in decisions INFLUENCES Experience continuum IS OPPOSED TO experience agreeableness</td>
<td>4</td>
</tr>
</tbody>
</table>

The second category shown in Table 4.4 integrates four codes that are considered to promote **self-authorship** linked to **provocative experiences** based on the discussion of the concepts below.
Table 4-4: The AC aspect ‘Experience’. The table shows the Self-authorship and provocative experiences codes with its working definition, the relationship with other codes, and the number of quotations.

<table>
<thead>
<tr>
<th>AC Aspect: Experience</th>
<th>Code</th>
<th>Working Definition in the Hermeneutic unit (Atlas.ti)</th>
<th>Related codes</th>
<th>Number of quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Reflections on Experiences</td>
<td>Any thought and ideas that recapitulate their MAYI experience (or any other experience) in order to be critical and connect situations. The main focus here is to mention the experience with a reflection or critical point of view.</td>
<td>COMPLEMENTS Experiences changing perspective</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Connections with other experiences</td>
<td>Connecting the learning from MAYI experience with other experiences in life.</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Experiences changing perspective</td>
<td>Testimonial of how the MAYI experience or some other helped to change their point of view or opinion. To change any idea or knowledge by exercising critical thinking.</td>
<td>Is COMPLEMENTED by Reflections on experiences</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Emotions associated with experience</td>
<td>During the interviews emotive answers are interpreted. It could be when expressing any element related to the interchange experience.</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

Provocative experiences and the development of self-authorship are terms proposed by Baxter Magolda (2001) and discussed by Pizzolato (2005). **Self-authorship** is when participants in an educative process begin to reconstruct their beliefs about knowledge, themselves, and themselves in relation to others. In addition, the **Crossroad** is included as a place of discontent where the participant feels the need to work towards self-definition, which is an important and intermediate element of a provocative experience. A **provocative experience**, unlike other Crossroads moments,
would lead to a commitment in a search for self-definition, rather than being only the recognition of a need and a chance to turn inwards. A provocative experience contributes to developing self-authorship to act and relieve the dissatisfaction (Baxter Magolda, 2001; Pizzolato, 2005).

The first three codes included in Table 4-4 were considered of high order: the ‘reflections on experiences’, the ‘connections with other experiences’, and the ‘experiences changing the perspectives’ of the participants. On the other hand, the ‘emotions associated with experience’ code identifies internal emotive responses. These four codes had a large number of associated quotations. The high numbers of quotations associated with these high-order codes demonstrates how stimulating the MAYI experience was. Grouping these codes shows that the students had a provocative experience (or many experiences within) at the MAYI. The following are ideas of four MAYI participants, which offer examples of provocative experiences and the development of self-authorship (Pizzolato, 2005).

After 5 years of participating in MAYI, Anibal described his growth after his experience:

With the help of the interchange... even my dad told me, you came back with another mentality, and you matured. Because you [started to see] other things, and like, you take a more responsible attitude, first of the acquired knowledge, the experience and the people you met. And, you adopt other attitudes that help much in your formation [Anibal, C1. 12/09/2011].

Anibal understood clearly the relationship between his experience in Alaska and his reconstructions of knowledge. A perspective that promoted his “maturity” or growth, in ways that even his father recognized and expressed. This recognition of his responsibilities towards knowledge, the experience and the people around him, creates an enduring way of orienting himself towards a mindful development.

Self-authorship is a process built on experiences and happens in phases. According to Baxter Magolda (2001), it brings an acute awareness to internal sources of beliefs and definitions. Definitions and beliefs from external sources are sometimes conflicting perspectives not promoting happiness. An example of this awareness was when Dulce expressed an
acute reflection with a tension in her identity in relation to her ancestor's language.

...And as a person, not [talking] in the academic arena, these projects serve to really value family, value... where you come from, and... I say... sometimes if I feel awkward. For example, today we went to [learn about the language]... and everyone was repeating the Inupiaq words, and I wasn’t repeating them; well some I was. And I was reflecting: “how could I repeat some words that are not my culture [nor] my language?” Then I said, “It’s like... disrespectful. How can I learn other things when I don’t know mine? Then, especially the issue of culture has made me think... "we are wrong, no?” At least, here [if they] are losing their culture, at least they have the evidence. And another thing that impressed me was that about oral history. All videos, cassettes, I mean the museum is really beautiful ... [back home] we don’t even have a museum or anything. So it has made me think a lot [Dulce C2/C3. 27/06/2011]

The experience encouraged a reflection in Dulce that questioned and changed her perspective regarding her own culture and language. She felt what Baxter Magolda (2001) described as a Crossroad: a place of discontent where the participant felt the need to work towards self-definition. Additionally, in the case of Dulce, her Crossroad made her think of her community-self, as she detected the need to rescue her cultural heritage—not only for herself, but for her community as well.

The disequilibrium state of a Crossroad is considered to be one of the first stages of self-authorship; a process that allows a student to move along towards the commitment of resolving that instability via internal self-definition (Pizzolato, 2005). For instance, after five years since his first MAYI, and three years since his second one, Rodo stated:

And, in terms of [my personal] relationship, I firstly [give more importance to] the school, and [then] you can say it was experienced hardship [with the relationship] and to different projects, for instance at my work [managing the forest resources at different communities]... Because there is also [my] responsibility when working on certain things and making decisions in communities that are not yours, there is also a responsibility. And so there are times when we only see a little bit, because I have some things to do, or she does. So, there was a distancing. And we have already spoken about all that (Rodo C1/C2. 12/09/2011)

Rodo had a high level of commitment towards his studies and his casual job at the National Forestry Commission of Mexico. This job was conflicting with his personal relationship. He and his partner went through difficult decisions that resulted in their agreement about spending less time together. This disequilibrium represented a Crossroad moment, a time when he committed to his internal search for self-definition.
According to Pizzolato (2005), Crossroad moments can leave students in a cycle of contemplation and feeling dissatisfied following formulas, but not acting to relieve their dissatisfaction in a way that would help them construct a new way of knowing. A **provocative experience** then, would lead to a commitment in a search for self-definition, rather than only the recognition of a need and turning inwards. A provocative experience contributes to the development of self-authorship, to act and to relieve the dissatisfaction of a Crossroad. A provocative moment regarding the development of AC in students is fundamental, as it needs a deep reflection on the lived experience and a transformation into a commitment to act. As an example in this case study, Nelly expressed confidently how her two MAYI experiences in 2008 and 2011 were an incredible opportunity that internally transformed into a feeling of commitment:

This experience has been very useful for me; it has changed completely my perspective of life, totally. Projects like this one… wow! They are really unique! I would really like to have more [projects] like this, and that many others could have the opportunity to live such a pleasant experience. However, as they were telling us, sometimes decisions should start being ours (under our responsibility), in our generation. So we should start to show some results, and prove that we have taken advantage of this experience; and that we are not going to be selfish and keep it just to ourselves, and forget about the people who have been with us. And so, this experience has been incredible! (Nelly C2/C3. 25/06/11)

It is interesting to observe that Nelly's idea is avoiding being egotistical. Self-authorship is sometimes confused with egocentrism instead of a focus on the self and one's relations with others (Baxter Magolda, 2001). It is my observation that Nelly did not display this confusion with egocentrism. Instead, I detect a clear perspective in her personal understanding of experiences such as MAYI. She recognized her experience as part of her preparation, which will eventually allow her to connect with other experiences in ways that will enable her action taking in relation to her community in Oaxaca. She is intuitively recognizing her self-definition.

It is significant to highlight that all these examples are ways to communicate the impact the MAYI experience had on the participants after a few years since their participation. That is, they were from 2006 (cohort 1; C1) and 2008 (cohort 2; C2). I did not observe this level of reflection in the participants who had only participated in 2011 (cohort 3; C3). The students
who used these examples had one thing in common, i.e. that it had been years since their first MAYI. In addition, most of them would have demonstrated commitment and repeated the experience in a different year. They had many opportunities to reflect, connect, and understand their feelings and perspectives in change. They had had the time to take small steps into action, and would help to reference and understand their experiences in MAYI as deeply provocative in their self-definition process.

4.4.1 Synopsis

This analysis of the Experience aspect of MAYI highlighted two major elements. Firstly, the analysis unpacked the students' personal stances through the used codes and categories, and depicted a common meaning of the MAYI experience. One important element that stands out in this study is the continuity of the experience, which not only depends on how enjoyable the previous experiences were, but also their previous experiences, their opportunities and their social support they found when they returned to their community from the field experience.

It was observed in tracing student subsequent pathways and actions that over the years following the MAYI field experience the students developed many reflections. It was clear that students, who were participating for their second time, or those who participated years before, were able to come up with deeper reflections. These kinds of reflections exhibited conflict or internal tensions, called crossroads. In turn, these could have made MAYI a personal provocative experience beyond the reflection and towards action, based on a sense of commitment. In some of the MAYI participants, these provocative experiences promoted their self-authorship in reconstructing their beliefs and themselves in relation to others.

4.5 Reflections in MAYI

Reflections are defined in the AC framework as the ability to enquire into our experience using critical thinking (Eames et al., 2010b, p. 4). Figure 4-4 is a conceptual map representing the set of codes classified under Reflections, and the quotations associated with it. In this MAYI analysis, the Reflection aspect is composed of 9 codes supported by 150 quotations
from the interviews. This Reflection network represents an outline of how the Reflection aspect is composed in the MAYI analysis. Furthermore, Table 4-5 shows some examples that illustrate the contents of each of the used codes for the Reflections aspect analysis.

**Figure 4-4: Network of codes integrating the ‘Reflection’ aspect.**

**Table 4-5: Examples of the AC aspect ‘Reflection’ in Spanish and English translation.**

<table>
<thead>
<tr>
<th>Reflection</th>
<th>Code</th>
<th>Quotation Example Spanish</th>
<th>Quotations example English</th>
</tr>
</thead>
</table>
| Concepts: questioning, adapting, developing | Dulce | ...dicen que tienen un manejo sustentable del bosque. Entonces me hace pensar esto que, aunque aprovechan los recursos... tienen la capacidad de aprovecharlos pero al mismo tiempo que se están regenerando. Entonces es decir no se afecta o no hay un desequilibrio en el ecosistema. Pero ahora con el comentario de Tom, si me hizo ponerme pensar así como que... ¿realmente habrá un proceso sustentable en todo esto o no? | ...They said that the forests have been managed sustainably. Consequently this makes me think that, even if they are exploited, they still have the capacity to be regenerated. Therefore there is no imbalance in the ecosystem. But now with Tom’s comment, he really made me think... is there really a sustainable process in all this?
It is a very complex issue to analyse. There are many things that make me think. Sometimes there is knowledge that you have very clear, and comments in the conferences, made me think: is it true? Is it not true? Or am I wrong? |
| Critical opinion | Edgar  
Si te cambia mucho la perspectiva de cómo ves las cosas... Si actúas. Yo creo que lo más importante como persona es la actuación que tienes tu. No se trata de que llegues tu y trates de convencer a todos y digas “esta es mi idea y tienen que hacer lo que yo digo” sino simplemente tratar de platicarles... “no pues yo viví esto y esto”. Estábamos platicando con los compañeros y: “a mi me toco ir a fulano lado” y si es muy bonito por que te toman mas importancia que si dijeras, no pues lo vi en Discovery Channel. |
| Reflections on Experiences | Nelly  
Esta experiencia me ha servido mucho; ha cambiado completamente mi perspectiva de vida, totalmente. Bueno, proyectos como este...wow! son únicos en verdad! Que mas quisiera uno que como éste hubiera bastantes y que muchos mas, más tuvieran la oportunidad de vivir una experiencia tan grata como esta. Sin embargo, como bien nos |

|  | Yes, your perspective on things changes a lot... Yes you take action. I think that the most important as a person is the actions you do. Its not about you trying to convince everyone and say, “this is my idea and you have to do what I say” but to try to tell them... “I lived this and that”. We were talking with some peers and: “I have gone to this place” and it’s very nice because they take more importance on you than if you said: I saw it in Discovery Channel. |

This experience has been very useful for me; it has changed completely my perspective of life, totally. Projects like this one... wow! They are really unique! I would really like to be more [projects] like this, and that many others would have the opportunity to live such a pleasant experience. However, as they were telling us, sometimes decisions should start being ours (under our responsibility), in our generation. So we should start
| Experiences changing perspective | Fátima (no grabación) Recuerda que ha cambiado su pensamiento y acciones desde el regreso, especialmente se siente más segura para participar en clases, en exposiciones y al hablar en público. Al hablar con las personas. También sus emociones habían cambiado, especialmente esto de sentirse más segura de sí misma | (No recording) She recognizes that her thought and actions have changed since she came back. Specially she feels herself more confident |
| Improve living conditions | Nelly [en Alaska encontramos sistemas diferentes que]... dan aportes diferentes a una cultura, pero que al mismo tiempo comparten ese sentido de comunidad no?, entonces ..., todo eso como que va generando una idea en mi de que bueno, pues a lo mejor en este sistema ... no es tan ... simple como yo pensaba, sino que tiene mucho más que ver, mucho más que estudiar, incluso algunas cosas que mejorar no?, por que después de todo eso es lo que se busca: el mejorar | [In Alaska we found different systems that] supports in different ways the culture, but at the same time they share this sense of communality. Therefore all this is generating in me an idea that this system is not as simple as I thought, but it has much more to see, much more to study, even some things to improve no? Because after all this is what we are looking for: to improve our living conditions no? |
| Questioning or changing ideas | Nelly ...por ejemplo en la comunidad siempre buscamos de que sea un manejo sustentable... Y bueno aunque aquí ya hemos tenido otras perspectivas de lo que es sustentabilidad y todo eso. Bueno a mi si me impactó mucho por que... he venido creciendo con esa palabra de sustentabilidad como algo “bueno” y llego aquí y dan otra perspectiva pues si cambia no? Todo, digamos que desde una perspectiva crítica, tengo que analizarlo y ver cuál no?, cuál sirve y cuál no o cuál me ayudaría para mejorar una teoría sobre eso. | ... For instance at the community we are always trying to find a sustainable management [of the forest]... and here we have had other perspectives of what sustainability is, and all that. Well it really impacted me as... I have grown with that word of sustainability as something “good” and I come here and they give me another perspective... it changes it, doesn’t it? Everything, let’s say that from a critical point of view, I have to analyse it and see which one. Which one works and which one doesn’t or which one will help me to improve a theory on that. |
| Reflections on Action 1 | Dulce ...me estaba comentando mi papá, que no se con que organización estaban trabajando lo de la “historia oral”, en mi comunidad. Entonces dice que en la asamblea dijeron que las personas que estuvieran en participar, creo que lo hacen sábados y domingos las sesiones. Participar como oyentes o nada mas. Entonces con las personas mayores que iban a dar las historias... podían participar. Y entonces ... yo dije ahhh, yo sí quiero participar, pero pues si se me hace pesado un poco la escuela, y... los sábados y domingos son los días de tarea... Y le digo a mi papá: ¿usted cree que yo pueda ir? | ...My dad was telling me, that some organization was working with the “oral history” in my community. So, he said that the [communal] assembly invited people with interest to participate during the sessions in Saturday and Sunday. Participate at least like listeners. So you could participate with the elders who were going to tell the stories. Then I said: yes! I want to participate, but I think it will be very heavy load with the school assignments that I do on Saturdays and Sundays. I asked my dad, do you think I could come? And he said, the assembly group were asking for commitment in participation, and not only when you could come. That is why I have not allowed me. And in general, as I...
<table>
<thead>
<tr>
<th>Reflections on Action 2</th>
<th>Montse</th>
</tr>
</thead>
<tbody>
<tr>
<td>¿es diferente ahora cuando escuchas de problemas ambientales que antes de ir al intercambio?</td>
<td></td>
</tr>
<tr>
<td>Si, porque antes era “problemas ambientales” y veías, bueno, yo veía la situación un tanto así de que: “la tala inmoderada de árboles... ihhhhh!!... osea ¿qué están haciendo?, ¡que mal!” y hasta ahí. Ahorita es de que... [se auto cuestiona] ¿que tanto están afectando? no solamente a los organismos que en ella, sino ¿a la comunidad? ¿Y a futuro?. Y ahorita pienso, “¿qué se puede hacer? Y ¿qué toma de decisiones se pueden hacer en ese lugar? ¿cómo se pueden llevar a cabo? Por ejemplo con las autoridades ir y decirles: “saben que esto no esta bien, aquí tienen una propuesta” como que a ver el tema más desarrollado.</td>
<td></td>
</tr>
<tr>
<td>¿Is it different when you hear about environmental problems, now compared to before the interchange?</td>
<td></td>
</tr>
<tr>
<td>Yes, because before it was “environmental problems” and you saw, well I saw, the situation a bit like: “immoderate tree logging ohh no!! I mean, what are they doing? It’s so wrong! And that was it. Now [she self questions] how much is it affecting, not only the living organisms but the community as well? And in the future? Now I think: “what can it be done? And what are the kinds of decisions that can be done in that place? How can they be achieved? For instance, go with the authorities and tell them: “you know, this is not right, here is a proposal” So I can see the topic in more detail.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reflections on Climate change</th>
<th>Edgar</th>
</tr>
</thead>
<tbody>
<tr>
<td>¿alguna creencia que hayan cambiado?</td>
<td></td>
</tr>
<tr>
<td>Lo del calentamiento global. Estando aquí te platican de calentamiento global y tú dices: ¡ay! Como que si no sientes mucho la diferencia pues si hace poquito mas calor o más frío, pues no</td>
<td></td>
</tr>
<tr>
<td>Is there any believe that you have changed?</td>
<td></td>
</tr>
<tr>
<td>About global warming. Here they tell you about global warming and you say: ash! Its like if you don’t feel much the difference because if it’s a little bit warmer or cooler, you don’t really note the difference, or you don’t worry as much. But</td>
<td></td>
</tr>
</tbody>
</table>
notas o no te preocupas tanto. Pero ya vas allá y ves que se está descongelando y que los osos se están muriendo, ahí es cuando de verdad ves… que su ecosistema está un poco más frágil y que con muy poquito se daña… ahí es cuando realmente ves que si está pasando algo. Solo yendo allá pues.

when you go over there you can tell its melting and that the polar bears are dying, then is when you really see… that their ecosystem is more fragile and its hurt with not much… then is when you really see that something is really happening. Only going over there.

Reflections on connections

Atzin
Cuando íbamos a ver a la gente mayor y que nos platicaban; como la del hielo! Es que me quedo muy grabada la experiencia del señor que me platicaba como los enseñaban a sobrevivir. Que los amarraban con una tripa…, y no se, era mas como… la población ahora de los jóvenes que no saben hacer nada de eso, o que ya no se interesan por las cosas de la comunidad. Que antes era… en conjunto, era el aprendizaje, no se… no era como tal una escuela, era que te enseñaban en la casa y te enseñaban todo: a sobrevivir, a cazar, a todo. Entonces ahora ya muchos jóvenes ya no lo hacen. Si hay jóvenes que todavía lo hacen pero son muy pocos. ¿Cuál es el problema que ves, al no conocer eso? Osea, como joven que no te enseñen esas cosas…?
Pues por que no tienes identidad. No tienes identidad. Si a lo mejor dices: “no, soy Îñupiaq” pero que tu sigues con eso? Osea no se ponen igual los trajes típicos como antes. ¡Y hay quien si lo hace! Pero hay

When we went to see elders and they speak to us; like the one about the ice! I have imprinted [the memory] the experience about the elder that told me about how they taught them to survive. That they tie them with a gut… and I don’t know, it was more like… nowadays the younger population does not know how to do this things, or they are not interested about community matters. That in the past, the learning was at home and they taught you everything: to survive, to hunt, everything. So, nowadays lost of youngsters doesn’t do that anymore. There are some, but very few. What is the problem of not knowing this? As a younger the fact that they don’t teach you this things?

Because you don’t have an identity. You don’t have an identity. You probably can say: “yes I am an Îñupiaq” but do you follow it? I mean they don’t wear the traditional outfits as before. And there are some that do wear them! But some who doesn’t. Those who doesn’t do the same, who doesn’t thank the whales. All that kind of things. And that too… as they are part of the United states, the try to be Americanized…

And everywhere is the same;
Three major characteristics are identified in the codes and expressions of reflection from the students. The first category reflects the deep reflections the participants expressed. The second category recounts those reflections that were promoting a change, and finally a group of reflections that touch on specific issues. The following three tables show the codes associated to each of these categories, and are followed by a discussion presented in the following paragraphs.

Table 4-6: The objects of reflection within the AC aspect ‘Reflection’. The reflective codes are shown with its working definition, the relationship with other codes, and the number of quotations.

<table>
<thead>
<tr>
<th>AC Aspect: Reflection</th>
<th>The object of reflection</th>
<th>Code</th>
<th>Working Definition in the Hermeneutic unit (Atlas.ti)</th>
<th>Related codes</th>
<th>Number of quotations from the interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflections on connections</td>
<td>These are ideas mentioning the connections on knowledge topics, actions, culture, and emotions, which influenced each other. Connections made by the individual are stated, and also reflected and critical.</td>
<td>Reflections on connections NEEDS: Connections of actions Connections of knowledge Connections with culture Connections with emotions</td>
<td>29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reflections on Action</td>
<td>The ideas and thoughts of taking action, its efforts and or the success when taking action</td>
<td></td>
<td></td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Reflections on Experience</td>
<td>Any thought and ideas that recapitulates their MAYI experience (or any</td>
<td>Reflections on Experiences COMPLEMENTS</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>s</td>
<td>other experience) in order to be critical and connect situations. The main focus here is mentioning the experience with a reflection or critical point of view.</td>
<td>Experiences changing perspective</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4-6 presents the first group of codes under the Reflection aspect, which gathers three codes: *Reflections on connections*, *Reflections on Actions*, and *Reflections on experiences*. The quotes these codes collectively group are recognized as reflections that exhibit higher order thinking. This refers to the mental process that integrates past experiences, and uses reasoning to solve problems. This process challenges the student to interpret, analyse, or manipulate information, while lower order thinking implies routine or mechanical application of previously acquired information. Higher order thinking skills should be understood as an individual property, because a situation that would require higher order thinking by one person could only require lower order thinking by another. Nevertheless, the use of higher order and lower order thinking are likely to be interwoven in an educative experience. These higher order elements of reflection are considered central to the promotion of action in learners (Lewis & Smith, 1993; F. Mogensen, 1997).

Table 4-6 shows that the number of quotations where the students expressed some *Reflections on connections* code was high. This shows that the students constructed many connections (see Connections AC aspect), but in addition these links had a reflective and critical approach. Some of these reflective approaches were comparative and some were evaluative. For instance, Dulce expressed a **comparative** reflection. She identified the resemblance between the Alaskan community and her Oaxacan community. With this comparison, she gained a deeper understanding of her own community. With disappointment she expressed that in many communities of the Oaxacan Sierra (mountain range), the oral history and cultural heritage rescue efforts are not implemented as much as they could, based on the example of Alaska.
...It allows me to understand my community even more so, because it is also a forest community. Then ... well ... oral history too... It allows me to make comparisons ... [for instance] also made me realize that ... in my community, in general in the Sierra Juárez, things are not like here. Here more emphasis is given to culture and there are more efforts to rescue it, but not there [in Oaxaca]. So, yes this knowledge has been very useful to me (Dulce, C2/C3. 27/Jul/2011)

This reflection suggests that the comparisons between cultures and its associated value helped Dulce to critically analyse the carelessness in her community about rescuing the rich Oaxacan culture. This quote is coded also as a critical opinion, a code that is categorized as a promoter of change (see Table 4-7 below). In this case, Dulce’s comment is evaluative in nature, with some disappointment associated, suggesting a feeling of rejection towards the fact that there are not many cultural rescue efforts where she lives.

Other objects of reflection were the actions taken, reflective evaluations where the Reflections on Action code was used. For example, most of the students decided to continue university after the MAYI, but for Edgar the decision of which career to follow was already planned, as he continued his family tradition to study medicine. However, he reflected about how the experience influenced him to consider other options. Furthermore, he concluded that even within medicine there is much work to do in the environmental area connected to a doctor’s professional activities:

I had it already planned, [but MAYI] gave me the desire to study something environmental, but I was set on medicine. But, if I were not so inclined to I would have studied something related to [the environment]. But I did not follow it up, and had the option here in Morelia: medicine ... “oh well let’s do medicine”. And in my house, my dad is a doctor, my brother is a doctor, is also the profession that I know since I was a child. I had a surgery with my dad, and he paid me... and so that has helped me. But if I had not been so inclined to medicine, I think I would have been, right now, studying something related. But I think by doing medicine one can help the environment a lot. A physician should be very conscious about the environment. Especially since doctors pollute much with surgical material. In the future we are supposed to change those ideas; [but] the gloves, the surgical material is highly polluting, because almost everything is disposable. There are many aspects that every physician should know (Edgar C1. 12/Oct/2011).

The code “reflections on experiences” show us examples of an important links between two of the AC aspects; how the group of lived experiences with the educative interchange promoted reflections. For instance, the example of Montse shows us that the memory of the experience is accompanied by multiple reflections.
How did the experience of Alaska help you grow?

By valuing many things. [It taught me] To value [my] family ... The connections among the family, our communication, help people, because that exchange was like... they gave you everything, and you have to give something in return; maybe not to the same people, but to others that you know you can do it to, and so, do it. Share your thoughts, knowledge, provided they are good, or with good intentions. Also to reflect on what I do with my life. And right now with this last exchange I am thinking about doing a master degree. Because I was thinking: to work or do the masters. But I think if I will do the masters, and after that [work]... yes, because I was hesitating a lot.

And also [I was thinking] what we have at home, because, either you want it or not, what you have at home is not the same as being outside. Yes, because it is another context (Montse C1/C3. 3/09/2011)

This particular example provides us with an evaluation of how important the experience was for Montse, and the ramifications of it. The MAYI impacted her at a personal level, where Montse was able to recognize and value her family and home. She expressed how important it was for her to share her experience within her possibilities, and to understand that the communication should be accompanied by good intentions.

Table 4-7 introduces the group of codes that are interpreted as promoters of change. The following sections will interpret them with examples of the reflections.

Table 4-7: The reflections inducing change within the AC aspect ‘Reflection’. The reflective codes are shown with its working definition, the relationship with other codes, and the number of quotations.

<table>
<thead>
<tr>
<th>AC Aspect: Reflection</th>
<th>Reflections inducing change</th>
<th>Related codes</th>
<th>Number of quotations from the interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>Working Definition in the Hermeneutic unit (Atlas.ti)</td>
<td>Critical opinion IS ASSOCIATED WITH Reflections on Experiences</td>
<td>25</td>
</tr>
<tr>
<td>Critical opinion</td>
<td>Comments that were creating an argument in regards to socio environmental issues.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experiences changing perspective</td>
<td>Testimonial of how the MAYI experience, helped to change their point of view or opinion, ideas or knowledge by critical thinking</td>
<td></td>
<td>23</td>
</tr>
</tbody>
</table>
During the interviews with the MAYI students, different ideas came through about a change in perspectives or ideas. The various changing signs were reflections of different qualities; for instance, the highly quoted code “Critical opinion” in Table 4-7. This collection of ideas highlights the students’ reflections and their values in regard to building new ideas. Accordingly, Montse argued about how the new generations are participating in the community forest management. Her evaluative comment perceives the younger generation in her community as making an effort to implement their knowledge without considering the elders’ perspective. She integrated the need for scientific research in the forest management, but not as the only source of knowledge; instead, she would integrate the elders’ traditional knowledge into the forest management. And with this idea, she mentioned her desire to propose a project that would integrate both perspectives as part of the management paradigms.

In the organization of the commissariat, new young people come, not knowing what has been done years before, and the basis of how things work. So, they come and do not know how to work or they want to work in their own way and this does not work for the community, and I’ve heard it from several elder people.

In my community the cultural part of local knowledge is getting lost. The works are focused on the forest and aquifers and the like, but only take the science perspective and they are not based on elders’ knowledge. Or [something like] how the perceptions were before, a few decades ago, or the circumstances in which the aquifers or forests were. So, I would like to do a job linking both [perspectives] (Montse C1/C3. 3/Sept/2011)
Montse’s comment is well connected with the many examples about the fusion between traditional and scientific knowledge about natural resources management. Some philosophers have equated critical thinking with evaluations and judgments. However, critical thinking is also identified as an analytical process towards the **construction of new arguments** beyond the evaluation and judgments (Lewis & Smith, 1993).

The code “Experiences changing perspective” relates to how MAYI was an important source of change for individual ideas. For instance, one of the key elements from Fatima’s interview was her recognition of her changing thoughts and attitudes when she came back from Alaska (see Table 4-5).

Another expression of the promotion of change was the ‘questioning or changing ideas’ code, which is pointing at students expressing some tension with their knowledge. The concept of sustainability was one that impacted most of the students. Nelly, for instance, found a change of perspective with this concept. She originally considered the notion of “sustainable” to be “good”. However, with the visit to an Alaskan ecological farm, and a deep explanation about the idealism behind the concept, she questioned her own judgment about sustainability. This happened in connection with a discussion from one of the owners of the farm. He discussed how the multiple materials and energy his farm uses makes it dependent on oil-based economy, considered to be unsustainable. What makes this example quite relevant is the context. The three communities involved in the MAYI are internationally recognized as having sustainable management of the natural resources. The Mexican participant students grew up their younger years, knowing and believing how important and good is the sustainable management of their forest. Therefore, this elaborated process of questioning that happened at the time is a promoter of critical thinking and the creative acts associated with it; for example, viewing a problem, posing questions, considering alternative solutions (even if no solution was reached at the time) and making plans to investigate further (Lewis & Smith, 1993).
Table 4-8 shows the codes that give evidence to specific topics on which the students reflected. The reflective codes are shown with its working definition, the relationship with other codes, and the number of quotations.

<table>
<thead>
<tr>
<th>Code</th>
<th>Working Definition in the Hermeneutic unit (Atlas.ti)</th>
<th>Number of quotations from the interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflections on Climate change</td>
<td>Articulating what they learnt about climate change. An expression of a change, adaptation or ideas modification in the topic</td>
<td>4</td>
</tr>
<tr>
<td>Improve living conditions</td>
<td>The idea of improving life in the communities. Reflections on how to become a better community. Reflections on how to become a better person.</td>
<td>3</td>
</tr>
</tbody>
</table>

The table indicates that there was not much diversity in the topics, and the numbers of quotations do not reflect many ideas being discussed about specific topics. Beyond the previous concept of sustainability, the other topics were climate change and improving their living conditions. From these two, it is interesting to focus on climate change details, as much of the information discussed during the field experience was in the context of climate change. In the following example, Edgar reflected on his experience process, where only by visiting a place like Alaska the concept of climate change became relevant, and he understood that the changes are factually happening in the planet.

Is there any belief that you have changed?

Global warming. [Over] here they tell you about global warming and you say: ash! It’s like if you don’t feel much of the difference because, if it is a little bit warmer or cooler, you don’t really note the difference, or you don’t worry as much. But when you go over there you can tell it’s melting and that the polar bears are dying, then is when you really see... that their ecosystem is more fragile and it’s hurt with not
much... then is when you really see that something is really happening. Only going over there (Edgar Cl. 12/Oct/2011)

4.5.1 Synopsis

In the analysis of the MAYI case study, I presented the Reflection aspect of the AC framework as an essential element to promote action in the participants to a field educative experience. The observed fundamental components were the objects of reflection, the reflections promoting change, and the reflections on specific issues. The objects of reflections were processes of reflection about the lived experiences, the actions, and the connections created during and after the MAYI. These reflections were considered to be of a higher order thinking as they were creating comparisons, evaluations and the construction of new arguments. Beyond these mental constructions, the observed reflections would also seem to be a promoter of changes in their thoughts. These changes would include elements such as questioning different concepts and ideas, understanding that the field experience changed their perspective, and that it would promote a critical viewpoint towards environmental topics. Finally, I observe that the reflections were specific in terms of the few concepts that were part of the critical discussions during the MAYI, such as climate change and sustainability. However, the specific issues were neither many nor diverse.

4.6 Knowledge in MAYI

Knowledge is defined as both a conceptual and practical understanding of sustainability, including the process through which knowledge is gained and used (Eames et al., 2010b, p. 5). The following Figure 4-5 is a conceptual map representing the AC aspect of Knowledge with its related codes and its linked quotations. For this study, the Knowledge aspect is composed of 13 codes and it is supported by 105 quotations. These results represents the students’ knowledge expressed during the interviews, rather than the information offered during the MAYI. Furthermore, Table 4-9 shows some examples that illustrate the contents of each of the used codes for the Knowledge aspect analysis.
**Figure 4-5: Network of codes integrating the ‘Knowledge’ aspect.**

**Table 4-9: Examples of the AC aspect ‘Knowledge’ in Spanish and English translation**

<table>
<thead>
<tr>
<th>Connections of knowledge</th>
<th>Code</th>
<th>Quotation Example Spanish</th>
<th>Quotations example English</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dulce</td>
<td>Las cosas que si veíamos que si había conexiones era lo de las plagas... a mí se me hizo sorprendente que aquí en Alaska, sobre todo por que son las plagas en los lugares más cálidos. Entonces decía: no pues imaginéese, aquí en Alaska que es frío hay plagas, ora ¿cómo nos puede afectar eso? Eso lo relacionaba yo. Entonces fue ahí en ese momento... yo hacia muchas relaciones. Yo antes no creía que todo estaba conectado con todo. Entonces ¿cómo, osea, cosas que nosotros hacemos en un lugar del mundo pueden afectar en otro? Entonces en ese caso en el aspecto forestal yo lo vi de esa forma.</td>
<td>Things that we saw were the connections, like with the plagues... I was surprised here in Alaska, because the plagues are in warmer places. So I was thinking: imagine, here in Alaska there are plagues and it is cold; now how could that affect us? I was making those relations. Then, it was there, at that time... I was making lots of connections. I did not believe before, that everything was connected with everything. Then how things that we do in certain place of the world can affect in another one? So in the case of the forestry example I realized it in that way.</td>
</tr>
</tbody>
</table>

| Bio-complexity           | Rodo:  | El primer año estuve en el departamento de | The first year I was in the bio-complexity department |
| Climate change | biocomplejidad con una investigadora de la universidad de Texas que se llama Carol (tengo sus nombres completos) Carol un italiano. Entonces... prácticamente a nosotros nos mandaban a campo no? Tu sabes bien que por lo del sol de media noche, aprovechar para recaudar toda la información que puedan, para que puedan procesarla en invierno. Por que tu sabes que en invierno las temperaturas son muy extremas pues, no les permiten ni salir a campo ni hacer sus actividades. Entonces de las 24 horas del día a lo mucho aprovechaban 20 no?... así, así. Y prácticamente nosotros fuimos partícipes de eso no, nos involucramos a ese ritmo de vida. [...]yo quiero llegar a ser una persona así. [...] a partir de ahí, mis perspectivas empezaron a cambiar mis perspectivas en decir, no pues yo me voy a dedicar a hacer investigación, al medio ambiente hacer cuestiones de esas pues... |
| Climatology | with a researcher from Texas University, her name was Carol; I have all the full names for reference... Carol an Italian. So practically we were sent to the field right? As you know, because of the midnight sun, they took advantage as much as possible to collect all the possible information, so they can process it in winter. Because, you know, the temperatures in winters are extreme; there is no chance to go out to do fieldwork, nor doing their activities. So, they took advantage around 20 a day of the 24 hrs. right? like that. And practically we were participants of that; we were involved in that rhythm of life. [...] I want to be a person like that [...] So from there my perspectives started to change, in the sense that I thought I am going to devote to research, environment and things like that...

| Fátima (notes) | She remembers how in Alaska the climate changes are much more perceptible until some time ago, because now in her community she perceives it in the rain patterns (research notes due to failure in record file) |
| Nelly: Pues si hubo algunos conocimientos que si me llegaron... Aquí en Barrow el tema en el que trabajé fue de climatología. Entonces estaba | Well yes, there was some knowledge that did touch me... Here in Barrow, the topic I was working on was climatology. So it was very focused in climate change, |
| **Ice knowledge** | Edgar  
¿Del idioma te acuerdas? Por ejemplo que para el hielo tenían muchas maneras de decir... como 30 o 60 diferentes tipos de decir, palabras. Por ejemplo aquí dices hielo y ya... nomás tienes esa forma de decir y que todavía no se perdía el lenguaje, ni allá ni en Ixtlan son lenguajes muy arraigados. Por ejemplo vas a San Juan y yo creo que muy poca gente que todavía hablan el idioma nativo de ahí. | About the language, remember? [Asking Aníbal] for instance that for the ice they had so many ways of saying it... like 30 or 60 different types of saying, words. For example here you say ice, and that is it... it only has that way; y that the language wasn’t yet lost, nor there [Alaska] nor in Ixtlán they are very rooted languages. If you go to San Juan, I believe very few people would still speak the native language. |
| **Oceanic currents** | Aníbal  
Yo lo que mas recuerdo y tengo presente como llegamos al BASC (al centro de investigaciones de ahí del ártico) fue las investigaciones donde nos ponían a participar con los científicos. Y ahí es donde aprendíamos más y nos involucramos directamente con la investigación pues que ellos estaban realizando. Y ahí aprendimos los problemas que estaban presentando, lo que es en la región del ártico,  
What I remember the most is how we got to BASC (the arctic research centre) where they made us to participate with the scientists. It’s where we learnt more and we got involved directly with the research they were developing. There, we learnt about the present problems and that in the arctic the climate change [was] mostly.  
Which project did you participate in? [Asking |
| **Plagues in the woods** | Nelly:  
Por ejemplo esa vez hace dos años cuando fuimos vimos lo de las plagas. Y pues cuando vimos el parecido entre gusano descortezador de ahí [Fairbanks] y el de Ixtlán pues hubo un clic no? Quizá este sea el futuro de nuestros bosques. | For instance that time, two years ago when we went, we saw about [the topic] of plagues. And when we saw the similarities with the barker worm from there [Fairbanks] and from Ixtlán there was a click no? Perhaps that is going to be the future of our forests. |
| **Sustainability** | Barbara  
Esto no fue diseñado ni acomodado para esto, para “Education for sustainability”...  
No  
E- No, Entonces como manejaste o como diseñaste o acomodaste a lo largo de los años, las visiones a futuro.  
¿Es una imagen que se les quiere promover a los muchachos?  
No, yo no tengo una imagen para promover.  
E- ¿Como ves eso, el futuro en los muchachos?  
Entonces para mi, primero que los jóvenes se toman en serio. Eso es el primer reto, que se toman en serio. Eso quiere decir que también tiene que pensar en que responsabilidades tiene para su familia para su comunidad para sí mismo, para su sociedad en grande. | This wasn’t design nor made to fit into “education for sustainability”...  
No  
No, so how do you manage, or designed through the years the visions for the future... is this an image that wants to be promoted to the students?  
No, I don’t have an image to promote.  
How do you see that, the future in the youngsters?  
For me, to start with the youngsters are taken seriously. That also means that they have to think in what responsibilities they have towards their family, towards their community, towards themselves and their big society.  
... So the only thing I want is that the youngsters improve their tools to analyse the inherited |
Entonces, solamente lo que yo quiero es que los jóvenes mejoren sus herramientas para analizar los aspectos que estamos heredando ahora para pensar en algunas implicaciones posibles. Aunque en términos como antropóloga estoy muy interesada aquí como la gente hacen sus decisiones; estoy menos interesada en generar en los estudiantes un sentido que “tienen que hacer decisiones” por que frecuentemente, las decisiones sin preparación son decisiones malas. Yo estoy menos involucrada en como ellos van a hacer sus decisiones, aunque siempre hemos incluido preguntas como:

Entonces si estamos pensando en este asunto aquí en Barrow, ¿cuáles serían las conexiones, la relevancia para asuntos que en tu comunidad está enfrentando? Pero lo que yo pienso, es más un asunto personal o una posición personal: si se puede generar un sentido de compromiso al presente, el futuro va a cuidarse. Por que también es importante tener alguna visión, y pensamos, hemos discutido allá también.

Si estamos hablando de las implicaciones de los cambios climáticos, que para mi son bastante espantosas, tenemos que pensar en ¿por qué el capitalismo tiene una visión tan corta?, ¿por qué el sistema de democracia con elecciones cada dos años tiene un aspecto de muy corta visión? Entonces por

aspects in order to think the possible implications. Even if as an anthropologist I am very interested in how people here makes their decisions; I am less interested in generate in the students a sense that has to “take decisions” because frequently, the decisions without preparation are bad decisions.

I am less involved in how are they going to take their decisions, even though we have included questions like:

So if we are thinking in a topic here in Barrow, which are the connections, the relevance for the matters your community is facing? But what I think is more of a personal position: if you can generate a commitment feeling, future will take care itself.

Because it’s also important to have a vision and we think we have discussed this (in Alaska) as well.

If we are talking about the implications of climate change, which are for my terrifying we have to think in, why capitalism has such a short vision? Why does the democratic system, with elections every two years, have such a short vision?

Then for me, of course, its important that youngsters see how complex is to generate a position about, lets say, the relationship between the whales and the petroleum. It’s more important that they can see it’s not black and white, that there are not only two sides.
supuesto que para mí es más importante que los jóvenes vean que tan compleja es generar una posición sobre, digamos, la relación entre las ballenas y el petróleo. Es más importante que vean que no es black and White, que no es two sides, no es una competencia, que hay ganancias y pérdidas en cualquier decisión. Para pensar en el proceso más que decir: entonces ¿cómo los ven en 10 años? Que es una pregunta que Laura siempre ha hecho que es una buena pregunta, es otra pregunta. Para mí estoy más enterada en el presente, como estamos pensando en nuestro presente. Por supuesto estoy preocupada por el futuro, y por supuesto por ejemplo la posición que tienen los Inupiaq de la ballena: “queremos que nuestros nietos van a tener ballenas” “queremos que nuestros nietos también van a tener la oportunidad de participar en el sistema educativo”. Y es una visión de futuro que incluye más de una generación.

...Entonces sí yo pienso que la visión de Laura y la visión de mi, son algo diferente. Que bueno! Y que también aunque yo no soy tan escéptica como Tom Zimmer sobre el concepto de sustentabilidad. Yo pienso que tenemos que pensar, mas que estamos pensando.

...el enfoque en la sustentabilidad como un factor que define la decisión comunal, fue central en nuestras actividades, y el

It’s not a competence, that there are gains and losses in any decision. To think in the process, rather than saying: so, how do you see this in 10 years? It’s a question that Laura has always done, is a good question... it is another question. For me I am more focused in the present, how are we thinking of our present? Of course I am worry about the future, and of course, for instance the position that Inupiaq has bout the whales: “we want our grandchildren to have whales” “we want that our grandchildren will also have the opportunity to participate in the educative system”. That is a vision of the future that includes more than one generation.

... So I do think that Laura’s vision and mine are different. So good! And that I am not as sceptical as Tom Zimmer about the sustainability concept. I think we have to think, more than what we are thinking.

... The focus in sustainability as a factor that defines communal decisions, was central in our activities, and that the focus (more that Barrow) is, how can you know what its happening? We are in a very complex world, how can it be understood what is happening?
<table>
<thead>
<tr>
<th>Topic</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>enfoque (mas que en Barrow) es ¿como puede saber lo que esta pasando?, estamos en un mundo muy complejo. ¿cómo se puede entender lo que esta pasando?</strong></td>
<td>So it was very focus on what climate change is, the oceanic currents, the concepts that Barbara also has tried to explain to us, like the tipping point, all that kind of things, no?</td>
</tr>
<tr>
<td><strong>Tipping point</strong></td>
<td>Nelly&lt;br&gt;Entonces estaba muy enfocado a lo que es el cambio climático, las corrientes oceánicas, los conceptos que Bárbara también ya nos había tratado de explicar, como el tipping point, todo ese tipo de cosas, ¿no?</td>
</tr>
<tr>
<td><strong>Whale Knowledge</strong></td>
<td>Atzin&lt;br&gt;De las conferencias... Bueno hay una que me gusto mucho acerca de un investigador, no recuerdo como se llamaba, pero estaba investigando acerca de las ballenas que regresan, que se van y regresan cada año. Pero el tomaba fotos de las ballenas cada año y entonces preguntaba a los adultos mayores de las comunidades, también a los jóvenes pero más a los adultos, que ¿qué ballenas habian visto antes? Osea como hacer un censo pero visual de las ballenas, para ver cuanta poblacion (como que se recicla) cual llega y se va, cual se pierde, cuantas murieron y ese tipo de cosas.</td>
</tr>
<tr>
<td><strong>Concepts: questioning, adapting, developing</strong></td>
<td>Dulce&lt;br&gt;Sustentabilidad, ¿que opinas? ... siempre se me ha hecho como muy dificil, ese concepto, como de definir y... en la escuela hasta eso no?, lo vimos muy poco ahorita, ... por que el primer año es así mas como materias de tronco común, no llevamos algo de especialidad. Pero si</td>
</tr>
<tr>
<td></td>
<td>Sustainability, what do you think? ... it has always been a difficult concept for me. Like to define it and... in school, we didn’t deal with it much now, because in the first year its more like common subjects, we don’t take much specific subjects. Even though we did talk about</td>
</tr>
</tbody>
</table>
comentamos en alguna clase los conceptos de: sustentable y sostenible. Y entonces ... me quede enredada y el profesor enredaba más. Y es que nos decía, hay algunas personas que utilizan... sustentable y sostenible de la misma manera, pero no es lo mismo. Entonces no recuerdo muy bien ahora como... quedamos, no porque discutimos mucho y todo eso. Pero nos decía que el más correcto es usar: ... sustentable. Aun así nos quedamos... con dudas, y la gente ... lo sigue usando igual. Pero yo lo relaciono por ejemplo que ahí en el caso de los bosques dicen que tienen un manejo sustentable del bosque. Entonces me hace pensar esto que, aunque aprovechan los recursos... tienen la capacidad de aprovechar los pero al mismo tiempo que se están regenerando. Entonces es decir no se afecta o no hay un desequilibrio en el ecosistema. Pero ahora con el comentario de Tom [Tom Zimmer en Calypso ecological farm], si me hizo ponerme pensar así como que... ¿realmente habrá un proceso sustentable en todo esto o no? Entonces si es así como una cuestión muy compleja de analizar y todo eso. Pero realmente... no nada más esto, hay muchas cosas que ponen a pensar. A veces hay conocimientos que uno tiene bien claros, y comentarios en las conferencias, como que pone a pensar, como que: ¿si será cierto?, o ¿no será cierto?

the concepts of: “sustentable” and “sostenible” (both sustainable in English. Latin American Spanish distinguish between these two concepts). So I was left all mixed up and the teacher was entangling us even more. He was saying that some people use... “sustentable” and “sostenible” the same way, but its not the same. So, I don’t remember well how was it at the end... but we discussed a lot and all that. But he told us that the proper one to use:... sustentable. Yay, we still had some doubts, and the people... still uses it the same way. But I relate it with the example of the forest where they say they have a sustainable use of the forest. So it makes me think that, even if they use the resources... they have the capacity to take advantage of them, but at the same time they are being regenerated. Therefore, there is no affection to the ecosystem. But now with the comment from Tom [Tom Zimmer in Calypso ecological farm], it really made me think... is it really a sustainable process in all this or not? Then, it is a very complex situation to analyse and all that. But really... its not only this, there are many things to think about. Sometimes there are some knowledge that one has very clear, and comments in conferences, like, they put
<table>
<thead>
<tr>
<th>Control taken by communities</th>
<th>o ¿estoy equivocada?</th>
<th>you to think, like: is that true? Or nor true probably? Or, am I wrong?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rodo</td>
<td>¿Crees que la comunidad tenga el control? Pues de alguna parte sí. Por lo regular en la sierra y aquí en particular en Ixtlan, la máxima autoridad es la organización comunal. Por ejemplo si la mayoría de los comuneros dice que no se hace, aunque estén bien los estudios técnicos y todo eso, simplemente no se hace. Pero pues prácticamente tienen la última palabra.</td>
<td>Do you think the community has the control? In a way yes. Regularly in the sierra, and particularly here in Ixtlan, the highest authority is the communal organization. For instance if the majority of comuneros says that its not going to be done, even if the technical studies are right and everything, its just not done. So practically they have the last word.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Information from listening</th>
<th>Edgar</th>
<th>Something I was remembering these days, for example when we went to Oaxaca, last time, a man was telling us, I cant remember his last name, but his name was Rafael. He was telling us about the transgenic corn. In Oaxaca they have a regional corn, but lately, and I am talking about 2006, they were incorporating improved corn and transgenic and all that, to experiment with the region. And now that we were on my sanitation class, the man was telling us a figure of the 15 to 20%, meaning that it was recently being introduced. And lately the figures were about the 60 to 70%; practically the regional corn disappeared, it was mostly improved corn and all that.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pos algo que me acabo de acordar en estos días, por ejemplo cuando fuimos a Oaxaca, la última vez, nos hablaba un señor, que no recuerdo su apellido, pero era Rafael su nombre, que nos hablaba del maíz transgénico. En Oaxaca tienen un maíz que es el de la región pero que últimamente, te estoy hablando del 2006, estaban metiendo maíz mejorado y transgénico y eso, para experimentar en la región. Y ahora que estábamos viendo las clases de saneamiento en mi escuela, nos daba una cifra ese señor en esa entonces del 15 al 20%, osea que apenas se estaba introduciendo y las ultimas cifras eran como del 60 – 70% prácticamente ya ahí el maíz ya había desaparecido, era maíz mejorado y todo eso.</td>
<td></td>
</tr>
</tbody>
</table>

To contextualize this analysis of knowledge, it is important to mention that the students were exposed to a variety of educational activities
and pedagogical strategies. They were exposed to knowledge and new concepts in a variety of forms. For instance, many lectures were organized, and concepts were treated in detail. Teams of students would participate in research projects where they would do some literature review and contribute to collect data on various topics, such as climate change, biocomplexity, biodiversity, etc. The students contributed to collect data in archaeological excavations, and help monitor some specific animal studies and trees to generate forest management information. They applied scientific methods, participated in discussions of concepts and experiences about environmental changes, history, traditional knowledge, indigenous culture and language in the communities (Barraza & Bodenhorn, 2012).

The codes of Knowledge can be organized into two categories: relational and declarative. Table 4-10 shows the relational code: ‘connections of knowledge’. This code identified quotations with evident elements of learning with a connected quality between topics or cultures. Ultimately, knowledge is perceived as a creation of our experience in the world. Therefore connections between knowledge reflect a higher order use of information. In the analysis the knowledge aspect, the code ‘connections of knowledge’ displays the largest amount of quotations. Students expressed highly connected knowledge. This relation will be further discussed under the Connectedness aspect for integration purposes.

Table 4-10: The AC aspect ‘Knowledge’. The relational codes are shown with their working definitions, the relationship with other codes, and the number of quotations.

<table>
<thead>
<tr>
<th>Code</th>
<th>Working Definition in the Hermeneutic unit (Atlas.ti)</th>
<th>Related codes</th>
<th>Number of quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connections of knowledge</td>
<td>The ideas expressing connections of certain knowledge from MAYI to other experiences in their life. For instance: Knowledge connected to classes at school Connections between two concepts</td>
<td>Reflections on connections NEEDS connections of knowledge</td>
<td>37</td>
</tr>
</tbody>
</table>
Table 4-11 displays the second category: **declarative** knowledge. Most of the Knowledge codes in the analysis were under this informative property, and yet not many quotations were registered in them.

Table 4-11: The AC aspect ‘Knowledge’. The declarative codes are shown with their working definition, the relationship with other codes, and the number of quotations.

<table>
<thead>
<tr>
<th>Code</th>
<th>Working Definition in the Hermeneutic unit (Atlas.ti)</th>
<th>Related codes</th>
<th>Number of quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information from listening</td>
<td>Expression of Information: Concepts: Ideas referring to the content of the lectures, interchange or course. It mostly refers to information being memorized or repeated with no reflection. Its not necessarily connected information (as there is also the connection of knowledge code)</td>
<td>Several topics (codes) ARE PART OF information from listening: Bio-complexity Climate change Climatology Ice knowledge Oceanic currents Plagues in the woods Sustainability Tipping point Whale Knowledge</td>
<td>15</td>
</tr>
<tr>
<td>Sustainability</td>
<td>Any understanding, discussion or opinion on the concept of sustainability</td>
<td>IS PART OF Information from listening</td>
<td>11</td>
</tr>
<tr>
<td><strong>Climate change</strong></td>
<td>Concept</td>
<td>Any idea associated to the concept of change in climate.</td>
<td>IS PART OF Information from listening; IS ASSOCIATED WITH reflections on climate change</td>
</tr>
<tr>
<td><strong>Oceanic currents</strong></td>
<td>Concept</td>
<td>Ideas around the massive move of seawater and its role in the ecosystem.</td>
<td>IS PART OF Information from listening</td>
</tr>
<tr>
<td><strong>Whale Knowledge</strong></td>
<td>Ideas learnt about the culture around the whales in Inupiaq tradition. Traditional knowledge and culture about whales. Memories about the scientific knowledge about whales</td>
<td>IS PART OF Information from listening</td>
<td>3</td>
</tr>
<tr>
<td><strong>Bio-complexity</strong></td>
<td>Concept</td>
<td>Ideas around the study of complex living systems</td>
<td>IS PART OF Information from listening</td>
</tr>
<tr>
<td><strong>Plagues in the woods</strong></td>
<td>Mention of the topic Plagues in the forest</td>
<td>IS PART OF Information from listening</td>
<td>2</td>
</tr>
<tr>
<td><strong>Climatology</strong></td>
<td>Concept</td>
<td>Ideas around the formal study of climate</td>
<td>IS PART OF Information from listening</td>
</tr>
<tr>
<td><strong>Control taken by communities</strong></td>
<td>All ideas around the concept of CONTROL learned in Barrow</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Ice knowledge</strong></td>
<td>Any memory or connection or reflection on what it was learned about the Ice</td>
<td>IS PART OF Information from listening</td>
<td>1</td>
</tr>
<tr>
<td><strong>Tipping point</strong></td>
<td>Concept</td>
<td>Ideas around changes in the natural systems</td>
<td>IS PART OF Information from listening</td>
</tr>
</tbody>
</table>

Ten of these codes pointed at specific topics that were studied during the interchange. In correlation, only 21 quotations altogether were recorded under these codes. This association shows that specific information was not
clearly memorized; on the contrary, when mentioning the concepts they were often vague, for instance:

...Yes, there was some knowledge that I gained, especially here in Barrow, I was dealing with the climatology theme. Therefore, the issues were focused on climate change, ocean currents, concepts that sometimes Barbara had already tried to explain to us, like the tipping point, all that sort of thing. And so it's not longer seeing them from a level (how to say it?) not down, but a little sketchy ... and so she comes and tells us: well, this and that is happening... but to see it [actually] here and with the experts who know of these issues, and they explain it with as much detail as possible... and that it was very interesting... (Nelly C2/C3. 25/Jul/2011).

Table 4-11 shows the code information from listening as highly quoted. These quotations are double coded as they also relate to the specific topics showed in the same table. Many of the topics were coded and showed as declarations, and not necessarily defined or related. Some would include anecdotal testimonies (see Table 4-9). Regardless, within this list of codes, two stood out—not only for the number of quotations but also because some quotations would also express some relations or connections. ‘Climate change’ and ‘sustainability’ were these two codes, which were central to the MAYI and displayed connected knowledge. For instance, Fatima did not remember other concepts when asked about it after three years of her MAYI. But she would remember how climate change was more perceptible in Alaska, and then she was able to relate that to her understanding of the rain patterns in the Oaxacan mountains.

Fatima remembers how in Alaska climate changes are much more perceptible ... because now in her community she perceives it in the rain patterns (notes from interview, Fatima C2. 17/09/2011).

The code ‘sustainability’ stands out with different expressions, starting with the example in Table 4-9 of how Barbara conceived sustainability within the MAYI. Clearly the information offered during the interchange was rich in environmental topics and aimed to create awareness in the students. Barbara mentioned that the MAYI was not designed to provide “education for sustainability”; instead, she aimed to promote taking the students seriously in their interests (discussed further under the ‘visions for the future’ aspect), which is related to the educative effort of focusing in the development of learners critical and reflective participation as is part of a broader understanding of action competence
approach (Breiting & Mogensen, 1999). However, the idea of sustainability was a predominant concept within the activities, and in general it was approached with a critical and questioning viewpoint.

I am not as sceptical as Tom Zimmer about the sustainability concept. I think we have to think more (than what we are thinking) [about] the focus in sustainability as a factor that defines communal decisions; [and it] was central in our activities, and that the focus is: how can you know what is happening? We are in a very complex world, [so] how can we understand what is happening? (Barbara. 14/09/2011).

Consequently the concept of sustainability was at the centre of the discussion during the interchange. In MAYI 2011 we visited an organic and ecological farm. The owner of the farm, and our host, showed us around and gave us some chores to participate in the farm activities. After working, in his final speech he strongly criticized the concept of sustainability. He pointed out that even if the farm were carefully designed to be integrated in its surrounding environment, and were an economically viable business with a fair social approach, there would be no way for it to be independent from the unsustainable oil industry, as some tools were made out of plastic and petrol which was needed for transportation. My observation after this was that the discussion led to mistrusting the concept. Students understood that any system would hardly achieve the sustainability ideal due to its reliance on energy and materials derived from petroleum (see ‘Concepts: questioning, adapting, developing’ and ‘sustainability’ Table 4-9):

But now with the comment from Tom [Tom Zimmer from the Calypso ecological farm], it really made me think... is it really a sustainable process, all this, or not? Then, it is a very complex situation to analyse and all that (Dulce C2/C3. 27/06/2011).

Finally, when asked about the concept of sustainability, Rodo (who participated in the first two interchanges) re-interpreted it so that it would be consistent with his professional activities. Certainly the concept was not exhibited as a memorized definition; instead it was a reflection that met his practical understanding. He was already part-time working at the Federal Agency for forestry management, and he was able to use the term sustainability with an empirical understanding.

About sustainability... in my career, which is forest engineering, sustainability depends on a natural resource, but in a rational way, you might say. And, this ... I
hope I can explain it, is simply to use it in a reasonable manner with methods. Such as here in the community. The community is [depends] 100% [of the] forest, it uses pinewood. For example, I have heard some comments: "you are only cutting and cutting and are not doing anything to regenerate", and that is not true because there are technical studies that say, for example, that the volume of the forest has increased in recent years. Therefore, that is sustainable because there are certain methods used to do [logging] such as removal, cutting, and everything...that instead of being damaging, are beneficial (Rodo C1/C2. 12/09/2011).

The different examples above allow us to follow the possible pathways of the concepts or information dealt with in MAYI. In the educators’ intention, the MAYI was rather flexible and would have a critical approach to a central concept, but there was not a single group of dominating ideas that needed to be learnt. The experience involved living in a way that aimed to be sustainable, and it led to a discussion, which left the minds of the learners questioning or doubting the information that until then they had always accepted as appropriate. This generated critical perspectives on sustainability. And finally, in some students the concept was adjusted to the needs of the situation, thereby creating a new reality.

MAYI left the students with knowledge that they were able to connect with other aspects or experiences in their life (see ‘connections of knowledge’ Table 4-17). Student’s participation and actions are influenced by experiences, but also by how applicable the gained knowledge could be (B.B. Jensen, 2000). In this sense, the MAYI recorded excellent knowledge connections.

4.6.1 Synopsis

The analysis of the Knowledge aspect in MAYI integrated a group of ideas, which were codified and organized in two categories. Firstly, the most important element of the knowledge was its connectedness, thus integrating the relational code of ‘connections of knowledge’. The second category consisted of declarative codes. This integrates elements of information learned in the interchange. Many concepts were clearly not memorized, but rather reincorporated into the students’ contexts. In the quotations of the numerous codes belonging to this category, the information exhibited many connections. The concept of sustainability for instance was selected and described for its relevance and its many expressions. The ideas around this
concept included those of the leader of the interchange, who displayed a flexible and critical approach to the incorporation of the educative experience; also the ideas of one student who faced a moment of questioning a concept, which he used to take for granted. Another student displayed an empirical and pragmatic use of knowledge behind the concept of sustainability. In the end, the aspect of knowledge shows there were some range of declared information, and mostly some concepts, like sustainability, that went through complex processes of connections of knowledge and other experiences.

4.7 Visions for the Future in MAYI

The Visions for the Future aspect is defined as: “...how we might like our future to be and what changes need to be made now for that future” (Eames et al., 2010b, p. 6). Figure 4-6 is a conceptual map representing the AC aspect of Visions for the Future with its related codes and linked quotations. In this study, the Visions for the Future aspect is composed of 4 codes and supported by 41 quotations. Furthermore, Table 4-12 shows some examples that illustrate the contents of each of the used codes for the Visions for the Future aspect analysis.

Figure 4-6: Network of codes integrating the ‘Visions for the Future’ aspect.
<table>
<thead>
<tr>
<th>Code</th>
<th>Quotation Example Spanish</th>
<th>Quotations example English</th>
</tr>
</thead>
</table>
| IDEAS, plans for action | Nelly  
Te haz acercado con los líderes de tu comunidad para ofrecer tu apoyo?  
Pues hablado así como en la mesa y platicándoles y esto y el otro. Pero sí, apenas me falta hacerlo como que más formal. Sobretodo porque en mi comunidad, yo creo que si sabe, todo es como que muy formal, donde dicen ahora sí, háblame de lo que tu quieras hablarme. Y ahora sí presentate a la asamblea y expón tu tema… y todo bien. Y ahora si ven y enseñanos tu papel donde este todo estructurado. Entonces he empezado desde platicarles: “en este viaje he hecho esto y el otro” desde una manera un poco mas informal. Pero si estoy tratando de enfocarme ya en que ellos conozcan de que yo si tengo el interés de compartir mis conocimientos y de apoyarlos. Entonces ahorita…. con mis 19 años yo ya tengo edad para participar en la asamblea de ciudadanos. Y pues ya poco a poco, también me pienso meter en la asamblea de comuneros porque yo si quiero ser comunera. Y pues empezar a participar en todas esas reuniones…, aportar ideas, y empezar a decirles, “pues Have you come to the leaders of your community to offer them your support?  
Well, just like a chat in the after dinner table. But I still need to do it in a formal way. Specially because in my community, I believe you know, everything is like very formal, where the tell you: “ok, now you speak to me of anything you want to talk to me; all right, now come to the Assembly and present your theme… and everything correct. Ok, now come and show us your paper, where everything is structured. So I have started telling them: “in this trip I have done this and that”. Somehow a bit more informal. Anyway I have tried to let them know, I have the interest and want to share my knowledge and support them. So now… with my 19 years old, I can participate in the citizen Assembly. And slowly, I want to participate in the comuneros assembly, because I want to be a comunera. Therefore start participating in all those meetings…. Give some ideas, start telling them “look I have this idea, what do you think?” start with these points, no? Even start elaborating projects so they can check them, share |
| History as part of Visions for the future | Barbará | Over the years, the historic and cultural aspect has been extended to the interests of the participants. That is a response from us... to respond to the concerns [of students]. Because for me, my background is more than anything in special education [with violent students]. |
| Desired or Liked Visions for the Future | Rodo | In certain way, I visualized myself with my studies in being a person...[because] I was in high school. Therefore from that point [MAYI] my perspectives, started to change. Saying, I will be doing research in environmental topic, or things like that. Before going you didn’t think of that? No, before I was very much into the computers. To dedicate myself to that, here in the CECYTE (school) the specialty is in Information technology. But after the interchange I was in my second year of high school, everything changed. I said, “I will be doing things about the environment” why? Because it is nice. |
Table 4-13 shows each code under the ‘Visions for the Future’ aspect. In this group of codes, two categories were identified. The **Ideas for Action** category is represented only by the code ‘Ideas, plans for action’. The second category is grouped with codes that were rather **Descriptive and Contextual Visions**. Three codes were identified under this: ‘Desired or Liked Visions for the Future’, ‘Visions for future undesired or disliked’, and ‘History as part of visions for the future’. The numbers of quotes in each code are correlated with students expressing more abstract ideas than descriptive or contextual visions for a future.

<table>
<thead>
<tr>
<th>Code</th>
<th>Working Definition in the Hermeneutic unit (Atlas.ti)</th>
<th>Related codes</th>
<th>Number of quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDEAS, plans for action</td>
<td>Thinking is actively considering ideas, and IDEAS ARE PLANS FOR ACTION. Any spoken idea or strategy that states a plan to follow or a vision of a future. IDEAS &amp; THOUGHTS: Presuppose students are engaged actively (Waks, 2011, p. 193)</td>
<td>NEEDS Preparation for an action EXPLAINS Visions for the future to wish or like IS CAUSE OF Thoughts working ideas</td>
<td>23</td>
</tr>
<tr>
<td>Abstract</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4-13: The AC aspect ‘Visions for the Future’ codes. Codes are shown with their working definition, the relationship with other codes, and the number of quotations.
The abstract category of **Ideas for Action** (where the code ‘Ideas, or plan for action’ is) comprised all the expressions with a suggestion or intention to execute them in the future. John Dewey had the conception of ‘ideas’ as plans for actions, and he relates it to the “thoughts” as the efforts to work out the implementation of those ideas (Waks, 2011).

I identified a high number of ‘ideas’ (see Table 4-13), an example mentioned earlier of the design and content of the interchange. MAYI never intended to implant an “adequate”, if any, “vision for the future”; rather, Barbara suggested that young people be taken seriously:

This [MAYI] was not designed for “education for sustainability”

No.

Then how did you design or accommodate the visions for the future? Is there an image that you would like to promote to the students?

No, I don’t have an image to promote to the students.

So, how do you incorporate the “future” with the students [in the interchange]?
So, for me, first thing is to take young people seriously. That is the first challenge: that they are taken seriously. That means that they would have to think about what their responsibilities are towards their family, community, themselves, the wider society.

I am very much for my personal vision, which is quite alive. I just want young people to improve their tools to analyse the aspects we are inheriting now, so we can think about future implications. Even though, as an anthropologist, I am very interested in how people make their decisions; I am less interested in generating in the students a sense where “they have to make decisions”, because often, unprepared decisions are bad decisions. Then, for me it is best to analyse the present ... (Barbara. 14/09/2011)

Taking the students seriously is imperative, as they would feel the freedom to participate within their own possibilities. As it will be discussed in Chapter 5 the possibilities depend on their social support and environment they find. In the example in Table 4-12, Nelly suggests that she needs to be prepared in order to be able to offer her help with the communal government. Nelly explains her understanding of her ability to participate within the communal government system, which in her case implied a formal presentation. She expresses her idea to propose plans and how she is preparing to enact them with excitement. But the implementation of this idea can take years. In this time there is a risk to loose the impetus for different reasons; however, by giving Nelly trust and responsibility, by taking her seriously, as Barbara mentioned, the possibility of action is highly probable. As Waks (2011) suggests, using Dewey’s concepts, ideas can turn into action only if they relate to students’ action-oriented attitude, and they can find ways and favourable environments to express them and attempt to carry out.

I observed that the MAYI conferences acknowledged the future perspectives of environmental and cultural situations. However, as mentioned, the MAYI was not looking to generate any vision for the future. In any case, the field expedition provided the students with an action-oriented foundation in order to generate informed ideas, which could then translate into their implementations.

Within the contextual or descriptive expressions, the ideas relating to the visions of the future were divided in desired or undesired quality. The ‘Undesired or disliked Visions for the Future’ code shows only one example related to an environmental problem, which is not considered significant for
this analysis. Conversely the code ‘Desired or Liked Visions for the Future’
is the second most supported code in this aspect with 14 quotations. This
shows that the most common expressed ideas were mostly desirous (see
Table 4-12, ‘Undesired or disliked Visions for the Future’).

The desired visions were about life expectations to develop a
professional work. For instance, working in a large enterprise or have one’s
own business, like a restaurant. There were some visions emerging from the
interchange experience that were specifically linked to their professional
focus on the environment; for instance, working as a forestry engineer, a
biologist, or doing research (see Table 4-12, ‘Desired or Liked Visions for the
Future’):

However, after the interchange I was in my second year of high school, everything
changed. I said [back then], “I will be doing things about the environment”… why?
Because it is nice. (Rodo C1/C2. 12/09/2011).

Some students focused their aspirations into a master’s degree or
even beyond the choice of profession; they were also, aspiring to write and
propose environmentally related projects to the communal Assembly (see
Table 4-12, ‘IDEAS plans for action’):

Moreover, slowly, I want to participate in the commoners’ assembly, because I want
to be a commoner. Therefore start participating in all those meetings…. Contribute
with some ideas, start telling them “look I have this idea, what do you think?”… [I
will] start with these points (Nelly C2/C3. 25/Jul/2011).

The student’s aspirations included the intention to stay local, for
instance focusing their professional work in the Sierra (mountain range)
region with its several communities (see Table 4-14 ‘IDEAS plans for
action’):

For instance, when I finish my degree, I will work, if not in my community, in the
Sierra [mountain range] but there. And not only with environmental issues, but I
want to relate it to the social arena (Dulce C2/C3. 27/06/2011)

Some focused their vision on promoting and preserving the
communities’ cultural heritage, for example creating links between elders
and youngsters. This included creating common visions for the future even
in the young, with a sense of responsibility to face the problems of their
community. Nevertheless, some of these visions became an aspiration about exploring or traveling to other countries (for instance, working in Canada).

The code ‘History as part of visions for the future’ reflects the past affecting the present interchange. This code only has three quotations associated, but these provide an idea of the context as given by Barbara (MAYI organizer), who explained how, through the years, the MAYI was re-focused towards analysing in more detail the cultural topics due to the students’ feedback (see Table 4-12).

In this MAYI analysis, the contextual or descriptive expressions of the ‘Visions for the Future’ aspect give an insight into what the participants were thinking for their future. Most of the examples were professional aspirations and ideas to take action about environmental issues. These motivations were reinforced or naturally adjusted after the MAYI experience, as the participants expressed. From an Action Competence approach, this is a relevant outcome of the educative experience for its aspiration qualities.

3.7.1 Synopsis

The analysis of the visions for the future aspect shows that the students expressed many ideas that were interpreted as plans for action. That is, they were general plans about doing something, and not specific thoughts to implement the action yet. These ideas are essential in order to take action if students are taken seriously and they find a favourable environment to implement them. On the other hand, they expressed visions for their future that described and gave a context for how they think of their future in professional terms, as driving their aspirations.

4.8 Action Taking in MAYI

‘Action taking’ in the framework is defined as “the intentional act of doing something. It is carefully-considered behaviour, that promotes sustainability” (Eames et al., 2010b, p. 7). Figure 4-7 is a conceptual map representing the AC aspect of Action Taking with its related codes and its linked quotations. For this study the Action Taking aspect is composed of 10
codes and was supported by 152 quotations. Figure 4-7 is arranged to show the aspect of ‘Action taking’ at the top level and its 10 directly connected codes. At the bottom of the figure, it also shows 7 codes that are indirectly connected to the aspect. Furthermore, Table 4-14 shows some examples that illustrate the contents of each of the used codes for the Action Taking aspect analysis.

![Figure 4-7: Network of codes integrating the ‘Action Taking’ aspect.](image)

**Table 4-14: MAYI examples of the AC aspect ‘Action Taking’ in Spanish and English translation**

<table>
<thead>
<tr>
<th>Code</th>
<th>Quotation Example Spanish</th>
<th>Quotations example English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Democratic Ideas</td>
<td>Nelly Pues [he] hablado [con mi comunidad] así como sentado en la mesa, y platicando. Pero si... me falta hacerlo como que más formal. Sobretodo por que en mi comunidad, yo creo que si sabe, que todo es como muy formal donde dicen: ahora si háblame de lo que tu quieres hablarme; y ahora si preséntate a la asamblea y expón tu tema, y todo bien. Y ahora si, ven y a ver enseñanos tu papel donde este todo estructurado.</td>
<td>Well, I have spoken [to my community] just like on the table [eating] and chatting. But... I need to do it more formal. Especially because in my community, I believe you know this, everything is very formal, where they say: ok now tell me what you want; now present this to the assembly and show us your topic, and all good. And now come over and show us your paper,</td>
</tr>
</tbody>
</table>
Entonces, he empezado desde platicarles así: “en este viaje he hecho esto y el otro” desde una manera un poco más informal. Pero si estoy tratando de enfocarme en que ellos conozcan de que yo si tengo el interés de compartir mis conocimientos y de apoyarlos. Entonces ahorrita... con mis 19 años, yo ya tengo edad para participar en la asamblea de ciudadanos y... también me pienso meter en la asamblea de comuneros por que ¡yo sí quiero ser comunera! Y empezar a participar en todas esas reuniones y pues también empezar a ir aportando ideas y empezar a decirles: “fíjense que yo tengo esta idea, ¿que les parece?” Empezar desde esos puntos, incluso empezar a elaborar proyectos. Y ya que ellos los revisen, compartirlos con ellos y pues va a llegar el momento en que voy a tener que hablar ante todos ellos. Pero si estoy tratando de darles esa platica con ellos.

Montse
Bien sabes que hay un grupo de personas mayores, que es un grupo importante. Ha sido con uno que otro, pero no con todos, por que desafortunadamente yo no he tenido tanta comunicación con ellos, por que mi papá antes era comunero. Pero de ahí tuvo un conflicto y dejo de serlo y por eso no habíamos tenido acceso a las asambleas y todo ese rollo. Pero pues gracias al señor Jorge Rojas, hay varias personas que saben de mí. Y que saben que ahorita estoy estudiando biología, entonces también

As you know there is a group of elders [in the community] and it's an important group. [I have talked] with one or another, but not with all of them, because unfortunately I haven’t had much communication with them, because my dad was a comunero before. But he had a conflict and stop being one, which is why we haven’t had access to the assembly meetings and all that. But thanks to Mr Jorge Rojas, there are few
| IDEAS, plans for action | Dulce  
Sí he pensado como en muchas cosas, y más relacionadas con mi carrera, osea se pueden hacer muchas cosas. Y si tengo... ese compromiso, tal vez ahora no tan a corto plazo, pero a largo plazo sí. Por ejemplo cuando yo termine mi carrera osea voy a ejercer, si no en mi comunidad, en la sierra, pero ahí. Y entonces no nada mas cuestiones tanto ambientales sino también quiero relacionar mucho lo social... Me gusta mucho relacionar las conexiones que hay entre la sociedad y la naturaleza... Y yo veo que es ahí el problema de las cuestiones ambientales, los problemas ambientales que hoy existen. Osea que las personas realmente han perdido ese respeto por la naturaleza y es ahí donde yo quiero trabajar. | I have thought in lots of things, and mostly related to my career, I mean lots of things can be done. And I do have that commitment, maybe not now in the short term, but in the long term, yes. For instance when I finish my degree, I will work, if not in my community, in the sierra [mountain range] but there. And not only with environmental issues, but I want to relate it with the social area... I love to relate the connections between society and nature... and I can see there is the problem, of today's environmental problems. I mean that people has lost that respect for nature and is there where I want to work. |
|---|---|---|
| Indirect actions | Aníbal  
No pues si como nosotros subimos las fotos al Facebook. Nadie cree.  
Y pues son un debate. Cuando matamos al caribú y: “hay antas matando los animales, (Edgar: a mucha gente no le pareció) ey”. Les dije: “no ustedes no saben la otra cara... ellos viven de la caza y todo” y ya les explique. (Edgar: Y aun así no los logramos cambiar de opinión). ¡No pero lo mataste! [Dicen] | Well, we did upload the pictures to Facebook. Nobody believes. They are a debate. When we killed the Caribou: “you are killing animals” (Edgar: lots of people did not liked it) yea”. I told them: “you don’t know the other side of the coin... they live of hunting and all that” and then I explained. (Edgar: and even with that we could not change their minds). No, but you kill it! [They said] |
<table>
<thead>
<tr>
<th>Participation in activities</th>
<th>Bruno</th>
</tr>
</thead>
<tbody>
<tr>
<td>¿Has participado en actividades de tu comunidad?</td>
<td>Have you participated in activities of your community?</td>
</tr>
<tr>
<td>En la poda. A podar pinos, o a desramarlos pues o a las reforestaciones.</td>
<td>In the pruning. Pruning pines or at the reforestation.</td>
</tr>
<tr>
<td>¿Y va toda la comunidad?</td>
<td>And, does all the community goes?</td>
</tr>
<tr>
<td>Pues va por áreas...</td>
<td>Well... some areas, they call it the faena, because it's a working day where you will not get money, but everyone must go. All comuneros or those who works in the community organization, except those at the offices.</td>
</tr>
<tr>
<td>Todos los comuneros o los que trabajan en la comunidad, excepto los que trabajan en oficinas.</td>
<td>Do you like it?</td>
</tr>
<tr>
<td>¿Y te gusta?</td>
<td>Yep, because they gave us all the equipment like a telescopic chainsaw, those long ones. So pruning the branches, only the marked ones. Only certain branches, it’s not pruning without sense. You kind of know how to do it. It’s not a laboured day and no one drives you there. It’s communal work; the only thing the [communal] company is lunch.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Preparation for an action</th>
<th>Miriam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Así como lo veo aquí, fijate que en eso del cambio climático y así, si me entraban ciertas así como dije: “ay no llegando voy a hacer esto, voy a hacer el otro”, así como que planteaba ciertos así como... “voy a empezar con mi familia”</td>
<td>As I see it here, in regards to the climate change, I got ideas, like I said: “when I get back I will be doing this and that” I was planning like... “I will start with my family”</td>
</tr>
<tr>
<td>¿Y te acuerdas que cosas?</td>
<td>Do you remember what kind of things?</td>
</tr>
<tr>
<td>Aha, como pues no se, empezar a... quizá algo ecológico o empezar a recuperar la historia de nuestro pasado, pues de mis abuelitos mas que nada...</td>
<td>Yea, like starting to... maybe something ecological or start rescuing our past history, well my grandparents’ more than anything...</td>
</tr>
</tbody>
</table>
Edgar
Primeramente, yo lo veo como desde el ámbito personal. Valoras más, así como que voy a reciclar esto... Dicen que las pequeñas cosas empiezan de uno mismo, y ya después tratar de decirle a los demás. Como ya sabes algo, ya sabes más o menos que el problema es grave, pues ya estas conscientizado... tratas de ayudarles o... no tratarlos así de convencer a que crean tus ideas, pero tratar de darles tu punto de vista para ver si, pues correlacionan contigo.

Yo a veces que voy a la huerta y así “vamos a tirar esto”, “no pues espérate” y a veces que vamos a poner una cerca y: “vamos a ponerle arboles para que...” pus así tratar de ser con el medio ambiente, por que por ejemplo las huertas, yo creo que, contamina mucho el medio ambiente: fertilizantes.... Simplemente estas cambiando el suelo, tirar los aguacates que te están consumiendo agua. Por ejemplo los pinos que según captan mucho agua y ese tipo de cosas.

Firstly, I see it from the personal scope. You value more, like: I am going to recycle this. Some say that small things start with oneself, and then try to tell the others. As you know something, you kind of know the problem is serious, as you are conscious of it... try to help or... not trying to convince them, but to tell them your point of view to see if they correlate with you.

I sometimes go to the orchard and [they said] “lets dump this” and “no, hold on” and sometimes we would go to do a fence: “lets use some trees so...” and so try to be like that with the environment, because for example the orchards, I believe, the pollute a lot the environment: fertilizers... as simple as you are changing the land use, taking down the trees that consume the water. For instance the pines that apparently capture plenty of water.

Two categories are distinguished in this aspect in the AC framework. They refer to the kind of actions: indirect and direct (Eames et al., 2010b; Bjarne Bruun Jensen & Schnack, 1997). **Indirect actions** (Table 4-15) refer to the influence to others contributing solving environmental problems, while **direct actions** (Table 4-16) represent direct contributions towards solving an environmental problem.
Table 4-15: The AC aspect ‘Action Taking’. Indirect Action codes are shown with their working definition, the relationship with other codes, and the number of quotations.

<table>
<thead>
<tr>
<th>Code</th>
<th>Working Definition in the Hermeneutic unit (Atlas.ti)</th>
<th>Related codes</th>
<th>Number of quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indirect actions</td>
<td>Actions that implies to promote others to take some action. E.g. Speeches, teaching</td>
<td>IS ASSOCIATED WITH Experience Continuum</td>
<td>17</td>
</tr>
<tr>
<td>Action and Social Networking</td>
<td>All ideas that mention the need or preference to work with other friends, peers, family or community in order to achieve goals. The important part is linking to other people.</td>
<td>IS ASSOCIATED WITH Family COMPLEMENTS social networking with friends NEEDS communication</td>
<td>18</td>
</tr>
<tr>
<td>Family</td>
<td>The mention of a family member as a receptor of communication</td>
<td></td>
<td>13</td>
</tr>
</tbody>
</table>

Table 4-15 shows how the indirect actions as part of the Action Taking aspect are strongly connected to social networking and the family. In this case study, this implies that students taking action had a strong link with the family and social interaction. For instance:

About the interchange, I believe it has had lots of influence in family matters. Firstly, because I am the oldest. Then, my sister Fatima came, who is 19 years old. She participated, with me, in the second exchange; she [also] went to Alaska. So that also has had an influence, no? Then, my cousins who are younger than me, I have a cousin who tells her mother: "I want to be like Fatima and like Rodo, I want to go out and to study this." Then also, I've always seen it. Also, yet, it bears more responsibility, as my dad has always told me: you are the role model for your brothers and the rest of the family (Rodo C1/C2. 12/Sept/2011)

This quote exemplifies the connections with the code ‘family’. The manifestation in it leads to reflect how influential one person can be after the field educative experience. In this case, Rodo felt his influence on his sister, who also participated in the second interchange. Besides, he also expressed a responsibility in feeling and his understanding of being a role model for his direct and extended family.
In other examples, friends were part of the indirect actions with the ‘social networking with friends’ code. These connections reveal that taking action is closely related to the interactions between people, particularly the close connections such as the friends and family. For its relevance, a further discussion about the transmission of action competence is introduced in Chapter 5.

On the other hand, Table 4-16 shows the codes classified as direct actions. Many of these direct actions codes are interconnected with other aspects of the framework, for instance, the ideas or plans for action already discussed under the Visions for the Future section. Also, the directly performed actions were the students acting in their communities. These actions are considered as part of the continuity, or the Experience continuum in Action competence, discussed also in Chapter 5.

Table 4-16: The AC aspect ‘Action Taking’. Direct action codes are shown with their working definition, the relationship with other codes, and the number of quotations.

<table>
<thead>
<tr>
<th>Code</th>
<th>Working Definition in the Hermeneutic unit (Atlas.ti)</th>
<th>Related codes</th>
<th>Number of quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience continuum</td>
<td>The look for other experiences similar or complementary to the lived one. E.g. Previous experiences that created the intention to participate in MAYI. Or Experiences held after MAYI with similar learning intentions. E.g. The intention to keep on studying or preparing him/herself.</td>
<td>Is INFLUENCED by: Experience agreeableness Experience disagreeableness Emotions involved in decisions Previous experiences</td>
<td>24</td>
</tr>
<tr>
<td>Participation in activities</td>
<td>Mostly refers to the participation in Environmental and cultural activities the practitioners has had in their communities (in the past).</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>IDEAS, plans for action</td>
<td>It is not focused only at their communities.</td>
<td>NEEDS Preparation for an action EXPLAINS Visions for the future to wish or like IS CAUSE OF Thoughts working ideas</td>
<td>23</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------------------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>----</td>
</tr>
<tr>
<td>Preparation for an action</td>
<td>Thinking is actively considering ideas and IDEAS ARE PLANS FOR ACTION. Any spoken idea or strategy that states a plan to follow or a vision of a future. IDEAS &amp; THOUGHTS: Presuppose students are engaged actively (Dewey &quot;the intellectualist Criterion for truth&quot; 1907; Schools of Tomorrow, 1915; Democracy and education, 1916)(Waks, 2011, p. 193)</td>
<td>Expressions of how the students are preparing themselves for action. This is part of being responsible for their own education.</td>
<td>15</td>
</tr>
<tr>
<td>Difficulties to participate</td>
<td>The explanations about the adversities in taking action and participating in activities</td>
<td>NEEDS Ideas, plans for action NEEDS Thoughts working ideas</td>
<td>14</td>
</tr>
<tr>
<td>Democratic Ideas</td>
<td>Any idea that deals with democratic participation or action. E.g. taking into account different perspectives</td>
<td>IS EXPLAINED BY Practitioners perception of participation</td>
<td>14</td>
</tr>
<tr>
<td>THOUGHTS, working ideas</td>
<td>Thoughts are efforts to work out the implications of ideas, by selectively arranging their components. IDEAS &amp; THOUGHTS: Presuppose students are engaged actively (Dewey &quot;the intellectualist Criterion for truth&quot; 1907; Schools of Tomorrow, 1915; Democracy and education, 1916)(Waks,</td>
<td>Is NEEDED BY preparation for action Is CAUSED BY Ideas, plan for action</td>
<td>13</td>
</tr>
</tbody>
</table>
The code ‘participation in activities’ is quite populated with quotations, and it is also associated to the ‘intention to participate’ code. This was coding any kind of participation in the community, regardless of its intentions. The reason for this is due to my interpretation of an action competent person as someone participating with a deliberate intention to learn, irrespective of additionally having the intention to solve environmental problems. In saying this, for this case, when it came to the actual ‘participation in activities’, participants were focus mainly on cultural and environmental activities.

The example seen in Table 4-14 (code ‘participation in activities’) illustrates how activities, such as pruning the pine trees, can be under simple personal interest such as using the tools, but they also denote the cultural context with a desire to participate of the communal activity to manage the forest.

Many of the codes from the direct and indirect actions had a ‘communication’ element associated in it (see Figure 4-7). Participants were expressing their memories, but also their ideas and intentions to participate and act. Nonetheless, in the educative field experiences, it is important to consider the individuality of each person. Focusing in the direct actions, and illustrating individualities, the ideas expressed by Nelly are a good example (see “Democratic ideas”, Table 4-14):

But… I need to do it more formally. Especially because in my community, I believe you know this, everything is very formal… I have been trying to show them that I have an interest in sharing my knowledge and supporting them. So at the moment, at 19, I have the right to participate in the citizens assembly and… I also want to get involved in the comuneros assembly [the local indigenous government] (Nelly C2/C3. 25/Jul/2011).

Considering the action competence aspects, the ultimate purpose of an educative experience is to promote students’ participation. The processes
of communicating and socializing are a kind of participation in a democratic process (hence the use of ‘democratic ideas’ code). Nelly expressed the desire to participate in speaking to the community. She had done it casually, but not properly, as she wanted, or as formally as her community expected her to. Then she expressed her ideas, or plans, to participate at her community’s meetings in a formal way. A democratic approach to education as a result of experience is a formative ideal of developing action competence. It is associated to the facet of ‘competence’ as developing the abilities and willingness to be a qualified participant, although it is important to understand that individuals are not always potential participants. They can become potential participants at their own time, when they can decide how and when will they be involved in actions (Bjarne Bruun Jensen & Schnack, 1997).

In this case, the individual participation was affected by the ‘difficulties to participate’, denoted by a code with various quotations (see Table 4-16). For instance, the example in Table 4-14 shows an important aversion to participating. In this example, Montse’s possibility to participate was highly dependent on the context, which in this case relates to a historical conflict of her family with the communal organization, resulting in a barrier to her access the communal assemblies.

I haven’t had much communication with them [the communal government], because my dad was a comunero before. But he had a conflict and stopped being one, which is why we haven’t had access to the assembly meetings and all that (Montse C1/C3. 3/Sept/2011).

The code ‘preparation for an action’ refers to expressions about doing something. But this preparation can become complex and is dependent on time. The preparation needs ideas and thoughts. The code ‘Ideas, plans for action’ denotes any expression of a plan to follow. These ideas, with a planning property, create a close connection with the ‘visions for the future’ aspect (see discussion in Visions for the Future).

On the other hand, the ideas are the precursors of ‘Thoughts, or working ideas’, which are the efforts to work out those plans. These codes and connections were formed considering Dewey’s concepts about “ideas” and “thoughts” (Waks, 2011). An example of a thought in this analysis was:
I was thinking, I still haven’t told Nelly nor Montse, but I have the intention to tell them: let’s come back and show something at the university, especially as it’s not until October [the activities at university], we have lots of time to plan it, a presentation or... I don’t even know what to propose because there are many things we could do... (Dulce C2/C3. 27/06/2011)

This idea was an intention to organize a showcase. After many meetings and more brainstorming, these university students transformed the intention into action by organizing a symposium at the university. Two relevant element for this action are relevant: all the organizing students participated for the second time in the MAYI 2011 and the symposium was their idea, while the university merely provided the space and allowed the opportunity. These actions are considered to be part of the code ‘experience continuum’ which is the participant’s search for further experiences in education. This code is reasonably important when it comes to taking action and highly quoted in the analysis (Table 4-16). Deliberating on the educative value of the MAYI experience and the strongly supported evidence of the participants, I consider the act of searching and continuing one’s education to be related to this action aspect. This gives a sense of its importance, and I will further discuss these ideas in Chapter 5.

The second example is Montse referring to her willingness to start projects in her community, and she is learning how to articulate the proposals:

I mean that [the cultural heritage] is something for everyone... And so it’s not lost. Because, at the moment I feel, with the influence of other stuff in the community, it is being lost very ugly [regrettably been lost], and it shouldn’t be like that. So, I would like to have the basis of how can you submit a project, and I am already learning. And how can you search for financial support... you can have many ideas, but if you don’t know how, then it’s just not done.

Ideas as plans for actions, and thoughts as efforts to work out those plans are essential to recognize an action-competent student. They become essential presuppositions to engage actively (Waks, 2011, p. 193).

This action-taking aspect should be recognized as both an educative process and outcome. In short: we need to act and to learn to act. Learners participating in an educative experience should be consciously involved in actions. Ideally, learners collaborate to design the actions, and it is important that they do so freely. The development of this aspect should lead
to an outcome that focuses on learners proposing the design of new actions, while the educators support and help promote this creative process (Eames et al., 2010a; Bjarne Bruun Jensen & Schnack, 1997).

As an educative property, the process of action taking must not give any direction to the participants’ actions; instead, it should promote a careful and critical analysis of the possible actions. Therefore, a participatory approach to environmental education should provide possibilities for learners to have an ideas plan, and to develop and exercise participation with a democratic perspective (Breiting, Hedegaard, Mogensen, Nielsen, & Schnack, 2009a; Breiting & Mogensen, 1999; Bjarne Bruun Jensen & Schnack, 1997; V. Simovska, 2004). As an example, in our case study, after the trip to Alaska, the organizers proposed to the students to present back to their community. Without telling them what to do, the participants spent a few weeks organizing two showcase talks in the local secondary school and one in the university. The intention for ‘Action’ in environmental education programs can be oversimplified, making students participate in simplistic activities without integrating all the other AC properties. By simplistic and isolated activities, I mean something like picking up litter, planting trees or learning the biological properties of an ecosystem, for instance. This simplification and disintegration of the other aspects of the framework can lead to rather negative consequences in regards to the AC approach. Thus, this educative approach must prepare for action while doing actions. The participants in educative experiences should participate in planned activities, but with an “Action Taking” focus, students should be encouraged and supported to create their own activities based on their perceptions and interests. In brief, to facilitate a learning process according to the “Action Taking” principle in an AC approach, it is necessary for educators and students to collaborate, and integrate both activities designed by the former, and new actions created by the latter. Any of these actions should help to develop a clear understanding of the learner’s freedom to participate.
4.8.1 Synopsis

The analysis of the Action Taking aspect shows in this analysis that actions after the MAYI were direct and indirect. The indirect actions refer to MAYI students influencing or encouraging friends and family to take some action in regard to environmental problems. The family and social context had a significant influence in the students’ action taking. This element connects with the discussion about transmission to friends and family. On the other hand, direct actions relate to the actions the students were doing after their experience in MAYI. The university students who participated in MAYI twice were highly motivated to act. The activities were focused on cultural and environmental activities. Communication was essential, both for direct and indirect actions as the student needed to negotiate their ideas to put them to work. As part of the direct actions (and continuing the ‘ideas’ from the visions for the future) the ‘thoughts’ become vital suppositions to engage actively. In this case study I observed some thoughts becoming actions, such as the students organizing a symposium. These recorded actions are links to the Experience continuum in Action Competence.

The analysis of this ‘Action Taking’ aspect shows further connection paths with another two aspects not mentioned in the Eames et al. (2010b) framework. For this I believe that the Experience Continuum and the Social Connections of friends and family, and their implications, need to be considered to be as important as the discussed aspects. Therefore the following chapter 5 of this thesis will be discussing them in detail.

4.9 Connectedness in MAYI

The Connectedness aspect is defined as: “the interconnectedness between people and all aspects of the environment: this includes making connections between thinking, feeling and acting (head, hearts, hands)” (Eames et al., 2010b, p. 8). Figure 4-8 is a conceptual map representing the AC aspect Connectedness with its codes and quotations. In this study, the Connectedness aspect is composed of 6 ideas or codes and it is supported by 128 quotations. Table 4-17 shows some examples that illustrate the contents of each of the codes used for the analysis of the Action Taking aspect.
Figure 4-8: Network of codes integrating the ‘connectedness’ aspect.

Table 4-17: MAYI Examples of the AC aspect ‘Connectedness’ in Spanish and English translation

<table>
<thead>
<tr>
<th>Code</th>
<th>Quotation Example Spanish</th>
<th>Quotations example English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connections of Actions</td>
<td>Fátima  Reconoce que ha cambiado su pensamiento y acciones desde que regreso del intercambio. Especialmente hablo de que se siente más segura para participar en clases, en exposiciones, y al hablar en publico. E incluso en hablar con las personas normalmente.</td>
<td>She recognizes that her way of thinking and actions have changed since she came back from the interchange. Especially she spoke about her improved confidence to participate in classes, expositions and public speech. Even when speaking with people in any regular day.</td>
</tr>
<tr>
<td>Connections of knowledge</td>
<td>Montse  Y de hecho cuando entre a la escuela como que encontré cosas que se relacionaban con eso. Osea esas conexiones con las culturas. Por ejemplo lo de las ballenas, ¿cómo es su biologia?, ¿cómo se debe estudiar su biología? Ya como que me dio bases para estudiar la biología de otros</td>
<td>As a matter of fact, when I started Uni, I found things that were related with it. I mean those connections with the cultures. For instance, on the whales, how is their biology? How is their biology studied? So it gave me basis to study other organisms. Like school works, but it helps.</td>
</tr>
<tr>
<td>Connections with culture</td>
<td>Miriam</td>
<td>Me encanto toda la conexión que hubo entre todos nosotros, aunque no con muchos de Alaska, pero me gusto demasiado convivir mucho con Laura, contigo, conocer nuevas personas que dije: “ay, va a ser difícil llevarme con otros tipos, (no tipos de personas), sino de diferentes partes. Y pues me encantó estar conviviendo, echando relajo, ay en partes, para todo hubo un momento... y estuvo divertido eso.</td>
</tr>
<tr>
<td>Connections with Emotions</td>
<td>Nelly</td>
<td>De decir si quiero! y tengo muchas ganas de llegar y cambiar las cosas, pues como joven dijeran, un revolucionario. Pues, si se dan muchas ganas..., y ahorita con todos esos conocimientos pues mas. Y ahorita con lo que voy aprendiendo en la universidad, pues si voy a tratar de llegar y empezar a forjarme desde ideas, proyectos, y empezar a discutir con las personas, y todo ese tipo de cosas.</td>
</tr>
<tr>
<td>Connections with other experiences</td>
<td>Edgar</td>
<td>A mi lo que me ha llamado mucho la atención, ahora que estudio la epidemiología, que es frecuencia de enfermedades y eso, por ejemplo te dicen: hace 30 o 40 años no se veían estas enfermedades. Por ejemplo el dengue que es habitualmente de climas cálidos, ya se esta viendo en climas donde</td>
</tr>
<tr>
<td>Reflections on connections</td>
<td>nunca se ha visto el dengue. Por el aumento de temperaturas y a mayor clima cálido hay más aumento de enfermedades parasitarias y ese tipo. Entonces pues te dicen: ya en fulano lado hay dengue, se ha demostrado que hay incidencia de tal y tal enfermedad por el aumento de temperatura. O otras cosas que he visto, en lugares donde hacía mucho frío; el aguacate sabes que ocupa una cierta temperatura. Y en lugares donde hace 10 años no podías plantar un aguacate por que a los 2 o 3 días ya estaba helada, por ahora en esta época ya hay gente de aguacates que tienen dos o tres años que ya no tienen problema.</td>
<td></td>
</tr>
<tr>
<td>... desde niña siempre son así mis papás. Entonces tratan ellos siempre de: “no, el refresco no”. Porque no se, no se te hace daño y además son puros químicos que te afectan el metabolismo. Y pues también contaminas, imagínate cuantas botellas algunas no se reciclan. Entonces no se exactamente de donde salió en mi casa como fue, pero desde niña yo soy así. Entonces mis amigos no lo eran y a veces yo no me daba cuenta, es algo como que tu lo vives... pero egoístamente. Entonces eso te hace ver como que no estás solo y tienes que ayudar a los demás.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>...Since I was a kid my parents have always been like that. So they would always try to like: “no, not sodas” because, I don’t know, it’s not good for you, they are just chemicals. And also you pollute, imagine how many bottles are not recycled. Therefore I don’t really know where did that came from in my house, but since I was a kid. My friends were not like that, and sometimes I didn’t realized its something like you live it... “Selfish”. That makes you realize that you are not alone and that you have to help others.</td>
<td>before, for the increase of temperatures. And the more warm weather the more parasitic diseases. So they tell you: there is dengue in certain places, and it has been proved that it’s due to the increase in temperature. Or some other things I have seen, in places where it used to be very cold; the avocado you know it needs certain temperature. So in places where 10 years ago it would be impossible to plant an avocado because within 2 or 3 days it would be frozen; well in this times there are people with no problem in that for the last 2 or 3 years.</td>
<td></td>
</tr>
</tbody>
</table>
In this analysis I distinguish three interconnected categories: thinking, feeling and acting, as suggested by the AC framework. The following three tables detail each of these elements introducing the codes that were used to identify the evidence of the connectedness aspect in the MAYI. Table 4-18 defines the connections of thinking and is exemplified in the following paragraphs.

Table 4-18: The AC aspect ‘Connectedness’. The Thinking codes are shown with their working definition, the relationship with other codes, and the number of quotations.

<table>
<thead>
<tr>
<th>Code</th>
<th>Working Definition in the Hermeneutic unit (Atlas.ti)</th>
<th>Related codes</th>
<th>Number of quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connections of knowledge</td>
<td><strong>The ideas expressing connections of certain knowledge from MAYI to other experiences in their life e.g. Knowledge connected to classes at school Connections between two concepts Understanding of culture in their community Knowledge is understood as information that is connected or utilized for the individual’s benefit. Information is understood as the memorization of facts.</strong></td>
<td>NEEDS Reflections on connections</td>
<td>38</td>
</tr>
<tr>
<td>Connections with culture</td>
<td><strong>Ideas or reflections about different cultures. For example, comparisons between the Mexican and Alaskan cultures and heritage.</strong></td>
<td>NEEDS Reflections on connections</td>
<td>24</td>
</tr>
<tr>
<td>Reflections on connections</td>
<td><strong>These are ideas mentioning the connections between knowledge topics, actions, culture, and emotions influencing each other. Connections made by the individual are stated, but also critically reflected. Topics Communities history or development</strong></td>
<td>IS ASSOCIATED WITH Critical opinion NEEDS Connections of actions Connections of knowledge Connections</td>
<td>29</td>
</tr>
</tbody>
</table>
The design for MAYI sought to understand (thinking) connections between the communities and activities. Barbara would encourage this as she explained:

We spent a week in Fairbanks. We worked two days with a boreal ecologist, [who was] excellent, excellent. We spent a day on an organic farm. That has its analogue in a visit we made twice in Michoacán, and an organic vegetable garden of Oaxaca [in previous years]. So I'm always looking for connections between different years and different places (Barbara 14/Sept/2011).

These efforts had learning consequences on the participating students in Alaska. The students connected, reflected and integrated complex knowledge during and after the interchange. For instance, Dulce expressed excitement about the integration of a complex idea that was synthetized in the phrase “everything is connected”. During her university classes, she was able to recognize the same idea and implications during a “theory of systems” class in her second semester at university. She felt excitement about knowing about this topic already after her first interchange; therefore she was able to understand it better, feeling that her knowledge had been reinforced.

There is a phrase that I specially like, I loved it since I discovered it, and it is: “everything is connected”. So, now that I had my ‘systems theory’ class in my second semester, and I said: wow! I thought only there [in Alaska] I would listen to this phrase. And so the teacher started to talk to us about so many things that I already had... a vision. I was saying [telling myself]: “I know this already... they told me that already”. So it really makes me really happy that sometimes the professor is telling us something and I say: ah well, I already know that, and so I reinforce [what I know], and I can state my opinions (Dulce C2/C3. 27/Jul/2011)

This previous example elucidates the connections between knowing and feeling. Dulce would express an important knowledge, but its associated emotion to understand it is what makes it relevant for her. Therefore, even if I follow the suggestions of three categories in this analysis, the connections the students create cannot be divided as such during a learning experience.
Another example of knowledge connection was Animal’s explaining about the construction industry in Barrow, Alaska.

The types of buildings [in Alaska] are built differently here [in Mexico] than in the North Pole ... So, the people ... and professors [say]: they live in igloos and so on. I say, no, that’s not it. Igloos [are] temporary camps, only for hunting and stuff. They had an erroneous idea of how buildings are over there [in Alaska]. That’s where one makes connections; I saw they built like that, with a pile foundation due to the permafrost, and I explained to them how it was. Yes, it is pile foundation ... [Over] there, it is the permafrost, which is a totally unstable soil, it is in constant motion and the system of pile foundation absorbs it [the movement] (Anibal C1. 12/Oct/2011)

In this case, Anibal was integrating a cultural learning, hence the use of the code “connection with culture” code into his professional knowledge as an architect. It was explained during the MAYI that in the Inupiaq language, Igloo means “house” in the North Slope, while worldwide the word is inaccurately associated to a dome-shaped icehouse. He then explained to his peers that this was inaccurate, as in Alaska igloos were modern buildings that used pile foundations. The level of connected knowledge that Anibal expressed was an accurate understanding of Alaskan culture that implied a change in perspective and helped focus his own professional interests.

Montse proposed an interesting reflection about the connections of knowledge:

...We have to take care of the forest, because it’s our source of subsistence. And actually, when I came back [in 2006], I did some interviews. I don’t even know why, but I wanted to engage. I conducted them with Atzin; in fact I still have the recordings. We conducted them with older people who had or hadn’t worked in the forest. And I found that for them the forest is the most important thing. It’s their life, their home, and [they expressed it] with a very warm feeling. We have to see it not for us, but for the ones that are coming (Montse C1/C3. 28/Jul/2011)

One of the strongest connections Montse did was with a further action he organized in teamwork with Atzin. They did some interviews with a few elders in her community. As a result, she realized that the people had strong and very warm feelings towards the forest, which actually represented their home and life itself. As a result, she reflected on how her generation should take care of the forest not only for themselves, but also for the next generations. This particular connection reflects how after Montse’s first MAYI experience, she continued her engagement with her
friend, and understood how important the forest was for her community. Examples such as this show how some of the connections had deep reflections associated.

Anibal participated in 2006, Montse in 2006 and 2011, and Dulce in 2008 and 2011. This suggests that, to create these connections through thoughts, it’s important to let some time pass after the educative experience. As with other aspects, it reveals how the understanding of the relationships between people and their environment, and the links between the natural and social worlds are regarded after some time, as the AC framework suggests (Eames et al., 2010b).

Table 4-19 shows the code used to identify the connections of emotions that were expressed in relation to the MAYI.

Table 4-19: The AC aspect ‘Connectedness’. The Feeling codes are shown with their working definition, the relationship with other codes, and the number of quotations.

<table>
<thead>
<tr>
<th>Connectedness</th>
<th>Working Definition in the Hermeneutic unit (Atlas.ti)</th>
<th>Related codes</th>
<th>Number of quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connections with Emotions</td>
<td>Connecting certain knowledge with feelings. Expression of emotions connected with the experience</td>
<td>NEEDS Reflections on connections</td>
<td>15</td>
</tr>
</tbody>
</table>

In terms of feeling, I identify five emotional properties in the participants’ experience in the MAYI. These emotions were confidence, pride, balancing emotions, gratitude and excitement to act. The examples below give evidence to the connections of emotions.

The confidence feeling took many forms. For instance the accumulation of experiences:

Especially in this second interchange, the first one too, but remarkably now more. I feel like... more confidence, especially because I have already participated once. I mean, I had already some bases, even if it’s not the same as we saw two years ago, but some things are. So, I feel... more excited, especially because [now] I have already studied one year at university, I have more knowledge, I feel excited, and not only for the fact of being able to participate. I feel I am more involved with questions than two years ago, because it felt like fear [back then]... and my reaction
was "oh no!" But in this exchange ... I felt more confident, I mean, "I am going to ask and everything" [reflects] (Dulce C2/C3. 27/Jul/2011).

My observations with students who participated in 2011 for the first time (C3) pointed at their confidence being developed, just like Dulce described previously. This translated in a rather low participation in the conferences, but based on Dulce’s connections after her first MAYI and other experiences, I expect most of the participants would become confident and engaged in future situations and discussions concerning environmental and cultural topics.

Another expressed feeling was the pride associated with the participation in the MAYI. For instance, in a context of very few women being professionals (i.e. with a degree) in the Mexican forestry communities, Dulce expressed a strong feeling of pride after her participation. She felt that other women, friends and family, could see her as an example and believe in their agency. Moreover, this made her feel good:

I feel very enthusiastic about being a woman and saying: “yes I can!” Probably this... will be an example, not that I want to be selfish, but it can work as an example to other women and say: “well, yes we can! we can do many things”. And then... I start talking with my girlfriends: “tell us what did you do [in Alaska]?” and all that. So, you feel good... “oh, your opportunity... it is something no one else has lived, and you are very fortunate, and you are really taking advantage of it”. And they tell me: “especially because it’s your thing, because it’s what you like”. And they say: “I would like to experience it as well... and all that, but it’s really not my thing, and we are really happy that you are one of the few people that are in school, because you love what you are doing, and it’s fantastic that they have given you this opportunity” (Dulce C2/C3. 27/Jul/2011).

Additionally, I observed emotional reactions that would sustain the promotion of action. For example in Nelly:

Saying: yes I want. And I really want to reach out, and change things, because as a young person, they would say: a revolutionary. Well, yes, raring to... and right now, with all this knowledge, [I feel it] even more. And right now with what I learn in college, I’m going to try to come and start forging myself, [initially] with ideas, projects, and start discussing with people, and all that sort of thing (Nelly C2/C3. 25/Jul/2011).

Nelly showed herself as an enthusiastic person who had many aspirations to participate in her community. I observed this in her after her participation in the 2011 MAYI. In this sense, emotions like the keenness expressed by Nelly become fundamental to sustain a passion to participate in difficult environmental problems.
Finally, an important emotion expressed during the interviews was **gratitude**. For example, Montse explicitly expressed it for the opportunity and the leadership of the MAYI organizers.

Anything else you wanted to add?

Mmm... well: thank you. Yes... thank you for the support; for your support towards us, for your translations, for putting up with us, financing us, and everything else. I think that it’s important to mention it. And so here we are, ok well, in Oaxaca, or wherever we are, for anything [you need] or [maybe] someday you want to go [to Ixtlan] and walk [around], [know that] we are there [you can count on me] (Montse C1/C3. 28/Jul/2011).

According to the theory by Fredrickson (2004), gratitude, like other positive emotions, appears to have the capacity to transform individuals and even communities. These changes broaden people’s thought-action repertoire. That is, they amplify the spectrum of thoughts and actions that come to people’s mind. According to Fredrickson’s theory, expressions of this thought-action promoted by a feeling of gratitude could be play, exploration, the envisioning of future achievements, enjoyment and incorporation of the feeling in one’s habitual modes of thinking or acting.

Finally, Table 4-20 indicates the two codes that were included under the Acting connections expressed after the MAYI.

**Table 4-20: The AC aspect ‘Connectedness’. The Acting codes are shown with their working definition, the relationship with other codes, and the number of quotations.**

<table>
<thead>
<tr>
<th>Code</th>
<th>Working Definition in the Hermeneutic unit (Atlas.ti)</th>
<th>Related codes</th>
<th>Number of quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connections with other experiences</td>
<td>Addressing other experiences in life to explain some connections with MAYI.</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Connections of Actions</td>
<td>Actions that are taken in connection with the lived experiences. Related to knowledge acquisition. Actions connected to emotions experienced in MAYI. Actions already taken in connection.</td>
<td>NEEDS Reflections on connections</td>
<td>8</td>
</tr>
</tbody>
</table>
Creating connections with actions (acting) is strongly complemented with the emotional section. For instance the ‘connections of actions’ exemplifies how confident the students were feeling after the MAYI. The confidence is reflected in other actions such as the participation in school classes (see example in Table 4-17). On the other hand, the ‘connections with other experiences’ code represents some of the students connecting actual experiences or knowledge with the environmental knowledge from the MAYI. Edgar brings an interesting example of these connections in Table 4-17. On one side, he describes his professional medical knowledge connected to the change in climate that he learnt about in Alaska. But not only that: his communal experience in the avocado fields bridges the observed change in temperatures in Alaska, a medical issue, and the production of avocados. The examples above provide an insight into how some students were able to connect experiences and actions, and how those were consolidated by knowledge and emotions.

Action competence is diverse and complex. The ability to meaningfully participate requires a high level of connectedness to achieve learners’ participation in sustainability actions. Most of the significant codes from the previous tables are related to a reflective process (“reflections on connections” code) creating a strong link between the Reflection and the Connections aspects (see Figure 4-8). In this way, significant reflections were interrelated with the actions, emotions and thoughts.

4.9.1 Synopsis

For the connectedness aspect analysis I used the three categories suggested by the AC framework: thinking, feeling and acting. The thinking (head) expressions concerned the connections between different scientific and cultural knowledge, and this knowledge was associated with an emotional expression. Based on the students who were able to talk about well-connected knowledge, this section also highlights the need that students have for some time after a field experience like MAYI to form some clear connections. The connected emotional (heart) expressions were confidence, pride, balancing emotions, gratitude and excitement to act. In
some expressions an emotional balance was observed. I propose that the AC framework should envision and search for a balance in emotions like this, which will be discussed in the next chapter 5. In this way, it can provide the learners with the skills to avoid irrational reactions and develop the ability to act upon voluntary actions. Finally the acting (hands) expressions were examples of how the actions were narrated in connection with the previous emotions and thinking. Other experiences and other actions exemplified strong connections beyond the MAYI experience.

4.10 Summary

This chapter presented the findings and discussion of the Mexico Alaska Youth Interchange using the six aspects of the Action Competence framework as a guide. The section presented the results of the analysis conducted with the QDA software Atlas.ti, which helped organize, visualize and make evident connections among the six aspects of the AC framework. The six aspects highlighted the following:

The MAYI was a provocative experience that promoted the self-authorship of the students. It also instigated their continuity by encouraging further educative experiences. Then, categorized as the experience continuum, students would look for more enjoyable experiences and would search for opportunities in their community to give continuity to the MAYI. Social support was essential for this to be effective. This will be discussed further in this thesis. The MAYI experience was the basis for reflection and integration of knowledge.

The reflections in MAYI were fundamental for the action competence of the students. The objects of reflections were the connections, the actions and the experiences. Some reflections were creating comparisons, evaluations, or new arguments. The reflections generated by the field experience were also recognized as inductors of change by questioning concepts or ideas and generating critical opinions of some concepts, such as climate change.

The Knowledge aspect integrated two categories: one showing a range of declared information, and the second demonstrating that the
students to have a high degree of connectedness in their knowledge. Concepts were not memorized, but some, like ‘sustainability’, were highly questioned.

The **visions for the future** showed the students expressed many ideas related to their professional future, but also more concrete ideas in relation to what would happen after their return to Mexico. Those ideas were considered as ‘plans for action’ that would need to be integrated with some ‘thoughts’ in order to put those plans into action.

When it came to **Action Taking**, there were two main categories observed: indirect actions and direct actions. The indirect actions were the social expression of the MAYI, i.e. when the participants were talking to friends and family and transmitting their ideas and new knowledge. The direct actions were observed mainly in the University students who prepared and organized a symposium upon their return. The experience continuum and the social interactions were essential, and I suggest incorporating them as part of the AC aspects.

Finally, three categories were mentioned for the **connectedness** aspect. The thinking connections denote connections of knowledge, while the feelings connections cover a range of fundamental emotions, crucial to promote action. Lastly, acting connections created links between actions, knowledge and feelings.

It was evident in some of these aspects that the students need some time after the field experience to elaborate some clear connections and formulate intentions to act. Students who participated for the first time did not display as much confidence and action during and after MAYI as those students who were repeating the field experience or those who had participated in the first two interchanges.
Chapter 5  Continuity and influence after the Mexico-Alaska Youth Interchange

5.1 Objective

This chapter presents an analysis of the continuity of experiences after the Mexico Alaska Youth Interchange (MAYI). This continuity is introduced following a temporal approach, using the concept of experience continuum according to Dewey (1998). This chapter unpacks the significant elements that were necessary for the process of continuity after the MAYI. As part of these elements the social influences are analysed as the supports and constraints of the continuity, with a comparative narrative between the two Mexican communities. Furthermore the chapter deals with the impact the MAYI students had on their closest social connections: their family and friends. Finally, the chapter interprets these social influences according to the concept of social capital in education, providing an argument to understand the students as agents of influence and action in their communities.

5.2 Introduction

In Chapter 4 I analysed the Mexico Alaska Youth Interchange (MAYI) case study, identifying various action competence (AC) expressions based on the six aspects of the AC framework (i.e. Experience, Knowledge, Action Taking, Visions for the future, Connections and Reflections). The previous chapter provided a deeper understanding of the MAYI case study in terms of action by scrutinizing how these aspects were present in the participants’ educative experience.

With that understanding of action competence in this case study, Chapter 5 introduces a temporal perspective. This is the educative experience in continuity; I present the recorded observations after the students returned from Alaska to their communities. The students who participated in MAYI had their trip to Alaska in different years, but this chapter examines the continuity for specific students who returned from the
MAYI, and spent either 5 or 3 years in their communities after their first participation. Many of the participants in this research were partaking in MAYI 2011 for their second time.

In this chapter, the temporal perspective is based on the Experience Continuum principle rather than a chronological sequence. Developing a theory of experience, John Dewey proposed a principle to discriminate valuable educative experiences. That is, experiences are judged positively or negatively in regard to subjective attributes and values. This is how an experience has a particular relation to action. The experiences promote immediate and long-term feelings that will influence later experiences. In a general sense, the feelings towards the experience are agreeableness or disagreeableness. An unpleasant experience could be unsettling for the learner and can be diminished to a narrative of replaceable and emotionally laden words, with a possible repulsion for future similar activities. On the other hand, a pleasant experience might promote the opposite, and even promoting in the learner a search for similar educative activities or experiences. Dewey points out that an experience is a growth development for the individual within, by, and for the experience. However, the effects of these feelings are what makes the concept of Experience Continuum significant for education, and might not always be within easy reach of the educator’s observations. Therefore, this principle implies a challenge for educators. There is a need to select, prepare or design educative experiences in the present so they become fruitful and creative in successive experiences. The search for succeeding experiences involves an intention and an effort from the person: this is the unique relationship between the continuity of experience and action relevant to the action competence approach (Dewey, 1998; Bjarne Bruun Jensen & Schnack, 1997).

5.3 The continuity of the MAYI Experience

This section explores the continuity of the Mexico Alaska Youth Interchange following the stories of some of the participants. After returning from Alaska, the students continued their life back in their communities. Their habitual life was changed by the integration of their
new learning and lived experience in Alaska. Identifying some of the important elements of these stories, the analysis in this chapter exposes the significant elements and factors that influenced the continuity after the MAYI educative experience. For this, I used the temporal approach implied in John Dewey’s (1998) principle of experience continuum, originally published in 1938. The value of this principle it brings forth an associated growth element for each individual student. In this section I discuss the continuity drivers involved in the growth of the students, and I will explore the social influences towards the MAYI students experienced once they came back to their Mexican communities. In addition, I provide a description of the social context that influenced those stories of continuity.

5.3.1 Analysis of the continuity

In order to unpack the elements of the students’ experience continuum of this case study, I adopted the temporal approach suggested by Dewey. I analysed the interviews with one of the organizers and eight interviews of MAYI students’ from 2006 or 2008 cohorts. Many of these students repeated in 2011 and/or 2008. Participant from these years shared a clear story about their actions and continuity after their MAYI. In order to recognize, organize and interpret the elements of continuity these interviews were codified in a hermeneutic unit created in the Atlas.ti software, as explained in Chapter 3. In addition, I incorporated my participant observations to create a narrative of the social influences that affected the process of continuity back in the Mexican communities.

In this analysis, five categories or temporal qualitative dimensions were identified to be part of the continuity: (1) Previous experiences; (2) Quality of experiences in MAYI; (3) Intention for further actions; (4) Continuity in studies; and (5) Actions taken. Table 5-1 below shows the relation between these dimensions in the rows and the different examples from the interviews:
Table 5-1: Dimensions of continuity showing examples expressed by MAYI participants.

<table>
<thead>
<tr>
<th>Dimensions of continuity</th>
<th>Barbara</th>
<th>Martie</th>
<th>Aníbal</th>
<th>Nelly</th>
<th>Rodo</th>
<th>Fatima</th>
<th>Dulce</th>
<th>Atzin</th>
<th>Edgar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous experiences</td>
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<tr>
<td>Monica participated in a conservation project with the WWF in primary school. She went camping and learned about environmental topics. This ignited her interest in environmental topics.</td>
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<tr>
<td>Quality of experience in MAYI</td>
<td>One of the most satisfactory experiences for her was to observe that the MAYI participants were eager to acquire knowledge and experiences. She described a positive experience with much excitement and interest about environmental education after MAYI, with a feeling of gratitude for the opportunity. He mentioned the MAYI experience as outstanding and very helpful. She wishes that more opportunities like MAYI could be developed and offered to others. He described MAYI as a positive experience that affected his choices in life and even extending to his family. He stated that the interchange in Alaska was a life changing experience. She had a positive experience in MAYI. She was excited to see other lifestyles and worlds with her own eyes, as opposed to only hearing about them through her brother (Rodo). She expressed excitement about being able to participate more in her second MAYI. She felt pride about being a woman with that opportunity and about understanding links between human societies and nature. She had a positive experience learning from others in the MAYI. She also felt she wasn’t in a strong emotional condition, so she regretted not taking advantage of every minute worthwhile. He had a positive experience during MAYI; i.e., he was positively surprised by the lifestyle of youths in Alaska compared to his own in Mexico.</td>
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<tr>
<td>Intention for further actions</td>
<td>She observed the intention of MAYI students to participate in communal meetings. She felt the need to share her knowledge and understanding. She wanted to be a teacher to share her knowledge with kids. She described the importance of connecting elements the way she learned in MAYI, and is consciously looking for more experiences. She felt the need to communicate her experience and knowledge. She wanted to create workshops with young people at her university to promote conservation. She picked biology as her profession because she saw it as a pathway into the area of natural resources management and policy. With his MAYI research experience, he visualized himself as a researcher. She felt the need to share her environmental knowledge and understanding. After being rejected from the first MAYI, she reapplied for the second. In Alaska she had the idea in advance to organize a conference back at her university.</td>
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<tr>
<td><strong>Continuity in studies</strong></td>
<td><strong>Actions taken</strong></td>
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<tr>
<td>She reports that 100% of 2006 and 2008 MAYI participant students continued their studies at University (and that 1 dropped out)</td>
<td>She observed how some students had a transformatave experience in MAYI and chose more activities to participate</td>
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<td>She observed the MAYI participants’ choice of career selections were somehow related to the environmental contents of the Interchange</td>
<td>She organized the conference “Scientific knowledge vs traditional knowledge” at the university. She expressed her self-confidence at university</td>
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<td>She observed the intention of 2011 MAYI students to continue university studies</td>
<td>She did some interviews to research in her community. In doing so, she gained a better understanding of her community’s culture in relation to the forest. She organized a university conference with a team of 3. She encouraged peers to think critically</td>
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<tr>
<td>Repeated the MAYI Experience. She decided to continue university once she was in high school</td>
<td>Repeated the MAYI Experience. She decided to study biology and after MAYI felt the confidence to choose biology as her profession</td>
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<td>Repeated the MAYI Experience. He said he would have studied information technology engineering if it wasn’t for the MAYI</td>
<td>Repeated the MAYI Experience. She had the intention to continue university after school before the MAYI</td>
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<td>Repeated the MAYI Experience. She claimed to tend towards biology as her professional choice in her university studies.</td>
<td>MAYI encouraged her to continue in the field of engineering business management</td>
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<td>She connected her studies of biology with the community, politics and management, particularly the topics of forest and water.</td>
<td>She felt the confidence of her university studies were influenced by her participation in MAYI even if the topic was not environmental</td>
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<td>He continued his architecture studies, but after MAYI he was interested in environmental topics, particularly environmental elements of architecture.</td>
<td>She felt the confidence to choose environmental sciences after her first interchange</td>
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<td><strong>Summary</strong></td>
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<tr>
<td>She organized the conference “Scientific knowledge vs traditional knowledge” at the university. She expressed her self-confidence at university. She did some interviews to research in her community. In doing so, she gained a better understanding of her community’s culture in relation to the forest. She organized a university conference with a team of 3. She encouraged peers to think critically.</td>
<td>She organized the conference “Scientific knowledge vs traditional knowledge” at the university. She expressed her self-confidence while participating in the second MAYI. She showed her participation by preparing a magazine to share participants experiences after MAYI, she never found if it had been published. She organized a university conference with a team of 3. She encouraged peers to think critically.</td>
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</table>
5.3.2 Previous experiences

Participation in MAYI was an individual decision of each student. Some adults at their school, the communal government, or from their family might have promoted or supported their decision, but ultimately the choice to participate in MAYI was theirs; and for this reason, I acknowledge that it was influenced, in different degrees, by each participant’s individual previous experiences.

With this in mind, this dimension intended to find a connection between previous experiences and the students’ motivation to participate in the MAYI. As seen in Table 5-1, two students with previous experiences were identified. Both students expressed their interest about environmental topics before participating, and connected their previous interest to their participation in MAYI.

The fact that there were only a few examples of previous experiences that could have promoted the interest for environmental topics leads me to suggest that the Mexico Alaska Youth Interchange might have been the origin and source of students’ interest about environmental knowledge and actions for most of the participants. With this information I can suggest that the MAYI was a trigger for the continuity in students’ experiences in environmental education. That is, the many experiences of the MAYI were significant precursors for the actions and ideas recorded in this chapter.

5.3.3 Quality of the MAYI Experience

As seen in Table 5-1, the interchange allowed for a range of experiences. From the perspective of Dr Bodenhorn, the organizer, the students showed curiosity and eagerness to learn during the MAYI. This was supported by the students’ narrative of experiences. For instance, Montse expressed gratitude for the experience, enthusiasm about connecting with the researchers in Alaska, and about integrating her knowledge in community projects. Rodo expressed a feeling of pride in taking part in the research projects, and he felt good visualizing himself as one of those researchers. Atzin described how challenging the language
barrier was when it came to socializing, but also that she was able to start communication with others in English after some time. Edgar and Aníbal talked about their exciting experience when they went hunting for caribou with their host families. However, when they posted about this fact in their online social networks, their peers back in Michoacán reacted negatively to the hunting, so they perceived a challenge to communicating their new experience. The quality of the experience brought these participants diverse emotions and challenges.

All experiences have a touching power able to promote change, modify habits and promoting actions. The promotion of change, and eventually of transformation, becomes growth (i.e. a development in intellect, moral values, emotions, and the body (Dewey, 1998). This growth is attached to the inherent values of the different experiences. On the basis of these values, we can discriminate between what is experienced (Dewey, 1998). A trip to Alaska was a rare opportunity for Mexican students to encounter an unknown world. The MAYI experience was positively valued, and an opportunity to grow through stepping out of their habits, feeling excited and challenged.

5.3.4 Intention for Further Actions

The students in Table 5-1 had many intentions and aspirations to act back in their communities once the MAYI in 2011 finished. In particular, Dr Bodenhorn observed intentions to participate in communal meetings. In addition, the students expressed their willingness to communicate their knowledge and experience. One example is the following quote from Dulce:

I was thinking, I still haven’t told Nelly or Montse, but I have the intention to tell them: let’s come back and show something at the university, especially as [University doesn’t start] until October we have lots of time to plan it, a presentation or... I don’t know even to set some proposals because there are many things we could do... (Dulce, 27/06/2011)

In the previous chapter this quote was used as an example of a thought that transformed an idea into an actions. In this chapter, it is used to show the continuity of an intention that eventually transformed in actions taken. In another example, Rodo expressed a feeling of pride when
talking about his participation in the research projects in Alaska. Besides, he felt good visualizing himself as one of those role model researchers. This conflicted with his original idea for his professional future, which was Information Technology.

It is essential to have these observations of how students imagine acting in the future. These simple observations speak of students with a new desire, which in turn broadens the external conditions necessary to accomplish it. When executing those intentions, they will be determining the environment in which they will be acting in the future. Consequently students are more sensitive and responsive to conditions that influence their choices (Dewey, 1998).

5.3.5 Continuity in Studies

One of the most significant ideas of the MAYI participant students’ was their continuity in attending University. As seen in Table 5-1 most of the students expressed that their decision to continue their studies was linked to their Mexico Alaska Youth Interchange experience. In addition, those students who already had decided their university subject before the interchange displayed an important change in their perspective, namely the integration of an environmental dimension into their future professions. For instance, Nelly stated that her first MAYI completely influenced her vocation and her decision to go to university. She describes her thoughtful exploration of potential professional careers:

When I had to choose between careers, the options were: environmental sciences, forestry and biology. On one side I said: forestry. I said: yes. It has to deal with the forest... yes I love it. But on the other side, biology... has a wider field of work, and then I said I could later probably focus myself on something else, and not only in the forest. And then I said: it could be environmental sciences, ... but with a more legislative approach, then this is when I said: what should I choose? Legislation, or should I do a broader field? So I said I will study biology and then, I will search for my specialization... and all that. Because my goal is to continue my studies after my degree, I will continue and keep on studying. (Nelly, 25/07/2011).

It is interesting to note that her professional pathway is connected to the many conferences we had; and on top of that, the idea she was clearest about was to continue her professional studies.
Revealing that the MAYI had an impact in the continuity of formal studies becomes relevant with a community focus. Mexico is a country with low upper secondary education (i.e. high school) achievement rates: only about 45% of students complete their upper secondary education. Of these, 85% of students go on to university. In addition, the completion rate in higher education is 71%. Looking at their whole education career, the rate of Mexican students who start primary school and finish a degree is only 27 out of 100. The states of Michoacán and Oaxaca, home states for the participant students, are classified as “early dropout” in upper secondary education, which means that in relation to other states in Mexico, a comparatively small percentage of youth finish secondary education and reach university. In Oaxaca the dropout rate is even higher longitudinally. Only 20 students reach higher education and barely 12 receive a university title (Kattan & Székely, 2014; Székely, 2013).

From the eight MAYI students selected in Table 5-1, seven have finished their university studies and are working in their field. One is completing his university studies. One has finished her masters’ degree and one more is preparing her admission exam to a masters’ degree (Nelly, Montse, Dulce, Aníbal, Edgar, Rodolfo, personal communication, March 2016). Contextualized in the education condition of the states of Michoacán and Oaxaca, these figures are highly successful in terms of continuity to higher education.

The consequences of this group of students continuing their studies can be interrelated with academic, economic, social and environmental education effects. Academically, students with a meaningful educative experience such as MAYI and a higher degree are more prone to become the catalysts of a shift in thinking, values and action for a sustainable future (Cortese, 2003). Economically, these students’ future average income may be 61 percent (and above) higher than their counterparts’ who dropped out of high school (Kattan & Székely, 2014), as higher education generates higher returns in the labour market. Socially, exposure to addictions tends to be higher when students drop out of school (Kattan & Székely, 2014). Finally, this is a group of students who chose professions with an environmental
approach or found a connection with environmental issues after the MAYI (i.e. environmental sciences, forestry engineer, biology, medicine, architecture, business management). The approaches and actions required in our current environmental crisis demands the actions of professionals from many disciplines to interact and collaborate (Johnson & Mappin, 2005). In addition, considering the indigenous background of the participants, and the mix of original cultures studied at the interchange, it is essential that these professionals have a clear perspective on the traditional ways of knowing. These systems of knowledge have an instrumental value in resolving environmental challenges. Most importantly, basing the solutions on the indigenous way of knowing provides an opportunity to address the healing of the relationship amongst humans and earth, linking learning with responsibility, and the long-term view essential for sustainability goals (Rich, 2012). For these reasons, it can be argued that projects like MAYI, with this high rate of continuity to higher education degrees, are a real long-term investment for education.

5.3.6 Actions Taken

In Table 5-1 I selected some examples of the evident and subtle actions the students undertook after the MAYI. For instance, Dr Bodenhorn observed that most of the students were finding ways to participate in cultural activities. Additionally, after the experience some students were actively curious and conducted surveys in their community to research and understand the relationship between their people and the environment. Nonetheless, the most significant and evident actions were those related to the ‘intention for further actions’ section above: the organization of a conference led by the university students, and a presentation led by the high school students. The following section on ‘social influences on the students’ experience continuum’ provides extensive observations about these actions.

There are clear connections between the actions taken and the students experience in Alaska. The significance of the interchange, as a transformational and growth experience, is also related to the
transformative potential of the place of learning and the emotional journey the students lived. I introduce these aspects as the underlying drivers of the continuity of experience in the next section.

5.4 Place and Emotions as Drivers in the Experience Continuum

As Dewey (1998) pointed out, the experience continuum principle is related to physical, moral and intellectual growth. The experience continuum documented in section 5.3 can be construed as part of the developmental growing of the students. I unpacked some of the important elements of the growth in the expanding, or continuing, effects of MAYI. In this section, I introduce place in learning and the process of emotional balance as important drivers of this growth process.

5.4.1 The place in the Learning Experience

The nature of the learning experience in the Mexico Alaska Youth Interchange can be interpreted through what some outdoor education authors’ claim in regards to place-based education. According to Waite and Pratt (2011) the place, where the learning occurs, plays an active part in learning. The educative value arises when a physical space is transformed into a ‘place’. This transformation happens when space, and its associated time, are endowed with meanings (Waite, 2013).

Initially, a trip to Alaska for the Mexican students would stimulate their learning through the novelty of the country and the adventure of the journey. The adventure was a balance between challenge and security, and current, future and unpredicted needs were satisfactorily met. In other words, the experience had a high degree of flexibility in resourcing and reshaping the place—elements that Armitage (1999) and Waite and Pratt (2011) recognize as important for place-based education. Nonetheless, the space that the students experienced in Alaska became a co-construction of a rich mosaic of land, oceans, skies, wildlife, food, people, communities and local history (Wattchow & Brown, 2011). The interaction between these elements of space and journey was impregnated with meaning in the
experience of each participant. The space and voyage in the MAYI was suggestive and evoked the interaction between the experienced journey and the imaginative reality of the participants in different spaces (Hill, 2013). This process transformed Alaska and the MAYI into a place of possibilities.

As examples of meaningful creations in a place of possibilities, the following quotes provide samples from the participants. Nelly explains in her words a vision to integrate knowledge and improve the relationship between her community and the forest:

I want to see the positive side of things... because my community's perspective has been fruitful. But I believe we have to observe different postures and try to improve [our] position. Maybe we haven't considered some aspects [therefore] we can improve them, maybe [in this way] we will be friendlier to the forest (Nelly, 25/07/2011).

Dulce, in the following example, explains how her desire of working in the mountain region is the most likely pathway for her:

From the first interchange... I had the intention... [Or better] I've never thought about working in an office or in the city, even less in the city, as I do not like it. So I have always thought: "I want to work in my town, in my community" or if it is not in my town, in the region. In communities where there are trees, I really love trees ... I've thought about it. Then after that ... I said [to myself] there is a lot of work in my community, in the mountains, then... "Why would I go farther?" It's there where I want to work (Dulce, 27/06/2011).

The place of learning in MAYI was removed from the students’ habitual place, but the two were conceptually connected. This was observed in the students’ ideas, where their communities in Mexico are constantly mentioned. The habitual place is a common experience in humans, where we developed all the meanings in life through previous experiences; a place where we understand the world through things, tools, people, languages, cultures, and values; a place that is normalized and naturally taken for granted. In other words, it represents a way of living immersed in habits (Bengtsson, 2013). The connections to this habitual place were constantly created during the MAYI experience, through the comparison of knowledge, culture, language, science and indigenous identity. The MAYI moved the participants to another place relying on new directions and meanings of development. The life of the individuals changed in the MAYI, and the world [for them] changed congruently. As Bengtsson (2013, p. 49) states:
“Experience is always worldly and the world experienced”. The world and the life of the individual are interdependent.

The MAYI offered the students in Table 5-1 an experience in space, and a journey that was created as a diversity of places. The students co-created a place rich in meanings during their MAYI educative experience, a place that became a place of possibility where development and growth happened.

5.4.2 Emotional balance in the experience continuum

Due to the fact that the concept of Experience Continuum involves an emotional element (that is, where the selection of further experiences is based on the agreeableness of the educative experience), this section discusses the emotions observed in the MAYI case study.

Table 5-2 below introduces examples of the emotions observed in the MAYI case study. In each row, the table shows the agreeableness and disagreeableness associated with the experience. These categories are based on Dewey’s idea of recognizing the participants’ perception of the educative experience. Additionally, further emotions involved in decisions are presented in the table with their observed examples.

<table>
<thead>
<tr>
<th>Emotions of the continuity</th>
<th>Montse</th>
<th>Anibal</th>
<th>Nelly</th>
<th>Rodo</th>
<th>Atzin</th>
<th>Edgar</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXPERIENCE'S DISAGREEABILITY</td>
<td>Couldn’t remember anything he disliked.</td>
<td></td>
<td></td>
<td>Atzin did not like the fact that it was always daylight in relation to the weather</td>
<td>Couldn’t remember anything he disliked.</td>
<td>Disliked the food</td>
</tr>
<tr>
<td>EXPERIENCE'S AGREEABILITY</td>
<td>Described a positive experience in MAYI. See quality of experience in Table 5-1.</td>
<td>Described a positive experience in MAYI.</td>
<td>Described a positive experience in MAYI.</td>
<td>Described a positive experience in MAYI.</td>
<td>Described a positive experience in MAYI.</td>
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</tbody>
</table>
Table 5-2 shows the observed emotions involved in the experience continuum. Dewey (1998) theorised that the continuity of an experience depends on the agreeable feeling developed towards any educative experience. All the participants described, in one way or another, their trip to Alaska as a pleasant experience (see Table 5-1), with only a few things they disliked. This might be helpful to understand the continuity of experience by the participants. Nonetheless, the expressions of disagreeableness and agreeableness did not show any clear continuity. Examples of this are:

- **Agreeableness of the experience**

  [In Alaska] we were for some days in BASC 9 Barrow Arctic Science Consortium, and later we were sent into some houses. He [Anibal] was sent to one house and I was sent to another one. That was fun; they treated me super well (Edgar, 12/10/2011)

- **Disagreeableness of the experience**

  The sun. Yes, the daylight, because the more sun the colder [it was]. And you said, "[The weather] looks nice today!" And no, it was worse. An also, it takes me long to sleep; and at bedtime, it was difficult [with the sun] and you would put a blanket or something on [to hide it] (Atzin, 01/10/2011).

The emotional aspect involved in the decision to continue an educational journey after a significative experience did not show clearly such a dichotomy. Instead, the emotions that were clearly connected to a continuity of the experience were the ones related to a decision-making process.
The emotions in relation to decisions are introduced in Table 5-2. The table shows examples of students expressing happiness to participate in the experience, a feeling of commitment, a joy in understanding a change in perspective, and an “emotional impact”, or, as more clearly expressed by another student, the confidence to choose their profession.

Some examples of these feelings are presented in the following quotes. Nelly expressed much happiness about participating in MAYI, but also a sense of commitment. This emotion was related to understanding that the opportunity required her to return to her community:

What has shaped in me [is] a sense of commitment, not only with this project [MAYI], but also with what I do, has had much to do with my family, I think. [I tell myself] “Nelly, you have this opportunity, not everyone does”. So, everyday I wake up and say “Nelly, remember where you are”. And sometimes that is a heavy commitment I put on myself. Because much is expected from the people who come, not everyone has this opportunity. And then I say: “Nelly you went there; now what are you going to do? You need to prove why you were special [enough] to come and participate in this project” (Nelly, 25/07/2011).

Rodo expressed the enjoyment of being challenged and change even if it required an emotional struggle (in a lengthy explanation, he had mentioned that he had given all the importance to his career, and therefore he had become more distant in his emotional relationships):

Have you become more sensitive since you went to Alaska?

Well, to some extent, yes... because I was careless, in few words... I was like... I [really] didn’t care at all. Typically, I dumped my rubbish. I would go to the [forest], and it’d be worth a peanut to me. In that kind of sensibilities, I did change. And in other issues, say emotionally or sentimentally, [I did] as well. (Rodo, 12/09/2011).

And finally, Atzin expressed her intention to do better in the future, with an emotion that was connected to the approach to future educative experiences:

Have you reflected about the trip or the experience?

Yes, next time I have a trip, I will take better advantage of it. Probably the conditions I was at the time weren’t really good. I had several personal problems. I think, I didn’t take as much advantage of it as I could; perhaps when you are surrounded by your own problems, you don’t take as much advantage of anything. Therefore I feel I could give more and use every minute (Atzin, 1/10/2011; my emphasis)
These were meaningful emotions: a sense of commitment, the expectations of the people around the participants, and an intention to take better advantage of future experiences. In some of the MAYI students then, the continuity was driven by these strong emotions.

Another implication of these emotional drivers for continuity was the students’ ability to act. I introduce the idea of balance between emotions and intellect as central to action competence. The MAYI experience helped some students to develop a balanced reactive response. For instance, in Montse’s words:

Yes, because before [when I heard] “environmental problems”, I saw the situation like: “immoderate tree logging: ohhh no!! I mean, what are they doing? That is so wrong!” And that was it. [she self-reflects] Now it is like, how much is it affecting? Not only the living organisms, but the community as well? And, [how about] in the future? Now, I think: “[ok] what can be done? And what are the kinds of decisions that can be made in that place? How can they be achieved? For instance, [we could] go with the authorities and tell them: “this is not right, you know, here is a proposal for you” So I can see the topic in more detail (Montse, 28/07/2011).

In this example, we can observe a reflection after Montse’s experience. After an emotional trigger, in the past she would react sensitively, judgmentally and chaotically to environmental problems. But now, she would balance this feelings with a consensual and settled questioning approach to the issue, trying to understand the source of the problem and thinking about a way to find solutions. In terms of action competence, it is a significant skill to be able to reflect before reacting (F. Mogensen, 1997). Those reflections become critical in order to find connections between the social and the natural environment. Furthermore these connections can lead into well-thought actions for environmental solutions.

The emotional balance expressed in Montse’s example is well theorised by F. Mogensen (1997, p. 435). This author brings a holistic perspective in education where critical thinking is a central element for the Action Competence:

A person who does not acknowledge his or her emotions becomes insipid, purely registering external stimuli, bored and incapable of distinguishing between the significant and the insignificant—and thus, will lack the impulse to act. To act purely upon emotions, however, is equally limited. Such persons become irrational,
victims of influence, 'sentimental' and 'private', with their actions often undertaken at random (F. Mogensen 1997, p. 435)

F. Mogensen (1997) also discusses how an emotional balance has a critical thinking element, allowing the individual to recognize the significance of options when a decision must be done. An emotional balance individuates a desirable educative experience that promotes growth in individuals. Individuals grow intellectually and morally, with the ability to develop both objective and subjective perspectives. Growing individuals learn to recognize valid and valuable viewpoints in a variety of personal and environmental circumstances acknowledging the particular context. However, as discussed by Dewey, growth can take different directions. Education should be rich in stimuli, conditions, and if possible opportunities promoting growth at an emotional level (Dewey, 1998). Promoting growth implies acknowledging positive and negative moods, emotions and affects. It is an emotional balance, which requires a critical approach, that will transform the ability to problems, make better decisions, organize life to be more adaptable, and handle crises in more emotionally reliable ways (Chavez & Méndez, 2008, p. 153).

In terms of environmental education, situations where learners can understand their emotional balance through experiences and search for further educative ones (and where educators can recognize this in the learner) exemplify the concept of discriminating valuable educative experiences mentioned by Dewey. Continuity can be identified as the willingness and efforts of individuals to be responsible for their own education. In regards to action competence, handling the situations with emotional balance can be considered a skill required to take action.

In section 5.4 I discussed the relevance of the place as a stimulating element of the MAYI experience. Moreover, the trip to Alaska became a place of possibilities where students created a place rich in meanings. This evoked the interaction between the experienced and the imagined reality of the participants. Consequently, I discussed how the duality of agreeableness and disagreeableness might be a simplification of the continuity of the educative experiences. Instead, the MAYI experience continuity was related
to the emotions involved in the decision-making process. Finally, I presented the educative experience, and its continuity, as promoters of an emotional balance that brings a deeper understanding of the concept of experience continuum.

5.5 Social influences on the students’ experience continuum

During my research in the Mexico Alaska Youth Interchange (MAYI), and after traveling to Alaska, I went to the two communities of the Mexican participants. I participated and documented actions that gave continuity to the practitioners’ educative experience. This section presents each community focusing on the local contexts that favour the continuity in student’s experience.

As part of the interchange program, all the students were in charge of communicating and sharing their learning in their communities. In San Juan Nuevo Parangaricutiro, Michoacán (San Juan Nuevo), I was able to visit and have a meeting to help organize the MAYI participants’ communication efforts. Together, we discussed the elements they had learnt and possible strategies to share the experience after the Alaskan trip. Unfortunately the presentation that we decided to carry out never took place for several reasons. On the other hand, when I visited Ixtlan de Juarez (Ixtlan), Oaxaca, along with Dr Barbara Bodenhorn, we had three meetings with the participants and we were able to assist the students to prepare and organize strategies to present their ideas. In this case, the students participated in two different academic opportunities contextualized as science events. The first was organized by the high school, and the second was a student-organized forum at the university. I participated as a guest speaker in both events.

In the following section I will present a narrative based on my observations to expand on these experiences. In this way I intend to ground and exemplify these ideas, elaborating on the contextual differences and situations in each community.
5.5.1 San Juan Nuevo Parangaricutiro, Michoacán

During my visit to San Juan Nuevo, I held a meeting with the students (four of the seven 2011 MAYI students took part) in order to organize their ideas and plan strategies to share the MAYI experience with the community. The MAYI students decided to share their experience in an oral presentation. During the discussion we went over the topics again, and the possible ideas from the interchange. At the end of the meeting, we planned some dates and possible formats to held a presentation. The following are my observations on the context of that meeting:

- The students had a positive intention to organize an oral presentation based on their experience.
- I could not see many initiatives or strength to develop the ideas nor the logistics further.
- As far as my observations were able to note, students’ relatives displayed positive and valuable support towards the students’ continuity.
- The communal organization managers and leaders had the intention to support the participant students and a sense of responsibility towards them.

After the first meeting no more meetings were held, and no follow-up continued in San Juan Nuevo. Eventually, the presentation (or any other way to formally share the experience with the community) did not take place.

In my observations, the lack of continuity was due to a number of external and contextual situations related to the communal institution that supported the students’ interchange. The Michoacán students struggled to maintain continuity back in their community because:

- No formal educational institution was linked and committed to the student’s development after the MAYI. The support the students received during the interchange came from the traditional communal government.
• Even with the sensible response from the communal government to the educative experience of the young people, this institution was focused on their responsibilities: the forestry industry and the tourism activities. In addition, during the time of the observations, the leaders and managers of this institution were dealing with a stressful auditing.

• Due to the previous points, there was weak support to these students from the communal government, affecting the possibility of continuity and the educational activities of the students as a group who participated in the MAYI experience.

• In addition, this situation happened in a context of chronic violence associated with drug-related organized crime. In San Juan, the crime phenomenon was putting pressure on commercial trade, affecting social regulations, the cultural life and politics. This situation was generalised to the whole state of Michoacán and a federal political issue in Mexico.

At that particular moment in San Juan Nuevo the communal government had no clear autonomous agency to help give continuity to the students’ educational experience. The students had clear intentions to continue, but as a group, they did not have enough impulse, or strong friendship connections between them in order to achieve any group goal. In the light of these situations the group continuity at San Juan Nuevo was not clearly represented. These conditions did not create the right situation to take the students seriously and provide them with support, trust, interest, care, value and a place to listen to their experiences in Alaska.

5.5.2 Ixtlan de Juarez, Oaxaca

In Ixtlan I was able to participate in two remarkable experiences in relation to the educational continuity of the MAYI participants. The first was the conference organized by the Colegio de Estudios Científicos y Tecnológicos (CECYTE). The second was a student-organized conference, held and supported by the local University, Universidad Sierra de Juarez (USJ). Both conferences were arranged by the institutions to be part of the
national “Science and Technology Week”. To organize the presentations, three meeting sessions were held with Dr Bodenhorn’s leadership and continued with my assistance after her departure. The intention for these was to state and organize the ideas the students wanted to share.

Firstly, CECYTE organized a conference during Science Week aiming to attract new junior high school students into this high school. As CECYTE had supported MAYI students from the start of the program, they wanted to show this experience as an added value to their school. The staff of the school integrated the experience of MAYI presentation in their activities, so the CECYTE students who participated in MAYI were able to share their experience. They prepared a multimedia presentation, produced informative materials (posters) that promoted reflections about their cultural identity, and helped decorate their school. The conference was a general explanation of the interchange and the students detailed their work through the following topics:

- Wildlife: owls, lemmings, caribou, whales, seals, polar bears
- Ice and tundra environments
- Natural resource management
- Cultural beliefs and whale hunting

The conference was highly attended and the students presented confidently. Over 100 participants joined. These were teachers and students from different communities of the region who were visiting the school and attended this conference. The quality of the information presented was highly detailed and it was interesting to observe the students’ confidence, and a clear improvement in their presentation skills. At the end, the audience expressed much gratitude and enjoyment for the shared experience.

Secondly, three university students, who participated in MAYI for the second time, led a forum at the university USJ supported by the CECYTE students. The science students of biology and environmental sciences named their forum as “Scientific knowledge Vs. Traditional Knowledge”. The title
was closely related to the topics discussed during the 2011 MAYI interchange. The organizers gathered around 30 people, students and teachers from USJ, who participated in a lively discussion around the two systems of knowledge. Some of the topics discussed by the students were:

- Spirituality and science
- The complementary nature of science and traditional knowledge
- Traditional and allopathic medicine and medical charlatanry
- Critical questioning, such as: Who validates the knowledge?
- Connecting controversial ideas, such as people giving value to ideas depending exclusively on the speaker’s physical appearance and ownership of a college degree. This in turn tends to invalidate the traditional knowledge in indigenous communities with low college attendance.

This critical and dialogic exercise lasted for 2 hours, with a final 30-minute intervention on my part. This intervention was meant to be a critical reflection on the definition of science. This conference was a self-organized action of communal reflection with a diversity of opinions. It challenged highly valued science knowledge and gave time and space to understand the diversity of knowledge.

To relate the continuity of the MAYI experience in Ixtlan with the action competence approach (Eames et al., 2010b), it can be argued that the USJ conference was an action with both direct and indirect impacts (action taking’ aspect). It was a direct action as the MAYI participants were leading the conference. The conference went deep into reflections and critical thinking about the value people give to traditional knowledge and a discussion about its conservation. At the same time, it was an indirect action as the participants promoted other students, young persons who were the inheritors of the traditional knowledge of this particular Oaxacan region. Students had a rich discussion about the recognition, value and preservation of diversity in knowledge (‘knowledge’ aspect). This traditional knowledge (the use of medicinal plants) is in fact a common way of living in
their communities. In order to contextualize this idea, it is important to recognize that these were environmental and biology science students, who grew up in families using traditional knowledge from the northern mountain (sierra) area of the state of Oaxaca. The MAYI students choose the “systems of knowledge” as a relevant subject for their peer students. It is significant because these populations constantly have to face dilemmas rooted in a “traditional-scientific” duality to manage natural resources. Several participants showed their enthusiasm and interest in the topic by drawing several connections and comparisons, and even highlighting tensions, between the sciences they were studying and the way they grew up (‘connectedness’ aspect). Indeed, some of the ideas between the scientific and traditional knowledge at the conference may have been conflicting for some individuals. Nevertheless, it was my observation that a balanced discourse between systems of knowledge was reached and performed during the general reflection.

In addition, as part of the action to develop a conference, I recognize the institutional efforts towards the students’ educative process. The support and concession from USJ University allowed an integration of the students’ experience, providing the possibility to increase and strengthen their learning and social networks. The institution and teachers were a fundamental support and encouraging environment for the students’ education and continuity.

The science week organization at the CECYTE and the conference organised by the students at USJ constituted two fruitful forums in terms of experience continuum for Action Competence for the following reasons:

- The MAYI students exercised their freedom of choice about how to share their experience. Both high school and university students worked as a group, with the need to coordinate everybody’s ideas to a final goal
- They presented themselves as role models, empowered by sharing their knowledge and reflections at both events
• Both conference were actions with different levels of participation from MAYI participants

• Their presentation promoted reflection in others about the learning experiences, and a critical thinking approach towards the main discourses of science.

• The conferences addressed the diversity of understandings in our environments

• Especially at the university level, a deep exercise of critical thinking was promoted in regards to the dominant scientific voice and the discriminated traditional knowledge, which is a highly important and valuable exercise in an indigenous community.

• The creation of communal reflections between peers promoted a re-evaluation of idiosyncratic actions

• The MAYI participants were left feeling empowered and with a sense of proud satisfaction after leading and participating in these forums.

• These conferences were an example of transmission to peers and friends of the participants.

5.5.3 Group cohesiveness and trustworthiness

During my experience in the communities, I was able to observe the MAYI students back in their habitual life and witness their development as a group. The participants from each community showed a different development in regards to the group’s cohesiveness.

In San Juan Nuevo I couldn't observe a matured relationship of trust between the participants related to an unachieved planned action. With the target of communicating their experience to their community, a group meeting was organised, which only four (of six) MAYI participants attended. Even with the intention to share and continue a part of their experience, they did not find the resources, the support, or the group cohesion to transform their efforts into an expression. I suggest that with increased support from their local institutions, their families and themselves as a
group, the participants could have reached better trust and reciprocity in order to consolidate a small group to develop their ideas.

On the other hand, in Ixtlan de Juarez, I observed the group of participants gather regularly and keep communication, and it was directly related to their achieved planned actions. The participants’ group started to be spontaneous and cohesive. For instance, during my visit to Oaxaca, the students organised a dinner out, which the majority attended. We had three meetings to organize the events to communicate their experience and they demonstrated commitment in preparing them. This was a small group of students who nevertheless showed friendship and trustworthiness. The small group presented their knowledge to a larger group in the public communication events. These events gave them a form of authorship to talk about environmental problems, where they were able to present their perspectives, and where they were listened carefully. These observations are interpreted as the first steps to build social capital, as Sander and Lowney (2006) proposed. That construction initially implied the MAYI students in Oaxaca creating connections and starting with a small group who had the intention to reach out; eventually they did by communicating and discussing environmental and cultural issues with their peers, a larger group. This process started as informal ties among the students, which transformed naturally into a more formal relationship with their peers.

5.5.4 Supports and Constrains to the Continuity of Actions

As read in the previous narratives, the organizers and I promoted the continuity after the MAYI educative experience. But this element didn’t have the same outcomes in the communities. It is important to consider both internal and the external factors as agents of continuity. In the MAYI case study, the students’ ability to share the experience was influenced by:

- External factors:
  - The social context generated by the schools and communities
The opportunities available to take action
- The quality of relationships within the students’ group
- The group-generated self-motivation to act

Internal factors:
- Individual willingness to share their experience
- Personal motivation and confidence to do so
- Initiative and ability to make decisions
- Feeling agency to participate

Environmental education with an action competence approach needs to acknowledge, discuss and plan for the internal and external factors that will affect the continuity of the educative experience. In this way people can carry out the action aspect.

With the intention to acknowledge and plan the continuity in an educative experience, I present some of the continuity challenges observed after the case study of the Mexico Alaska Youth Interchange. The opportunity to visit the two different Mexican communities helped me to develop an interpretation of the experience continuum concept. In some cases, the continuity in education can be very fluid, but in other cases many issues can bring complexity to this flow. Table 5-3 and Table 5-4 below summarise the positive and the challenging outcomes from MAYI in terms of experience continuum.

Table 5-3: This table presents some observations, challenges and some possible ways to address them in San Juan Nuevo Parangaricutiro, Michoacán, Mexico.

<table>
<thead>
<tr>
<th>Experience continuum challenges after 2011 MAYI Experience</th>
<th>San Juan Nuevo Parangaricutiro, Michoacán</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observations</td>
<td>Challenges</td>
</tr>
<tr>
<td>Students had positive intentions to share their experience</td>
<td>Friendship relations between participant students were not strong enough to consolidate the group.</td>
</tr>
<tr>
<td>After MAYI some individual actions</td>
<td>Individual actions were isolated. Local</td>
</tr>
<tr>
<td>were taken towards minimizing environmental impacts</td>
<td>institutions related to the MAYI did not seem to be aware of these actions.</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>The individuals within the institutions (such as managers) had positive intentions to continue supporting the MAYI students.</td>
<td>A forestry industry auditing deviated the attention of managers. Contextual violence in the community and state. It was a stressful period at the communal forestry enterprise (the local institution supporting MAYI)</td>
</tr>
<tr>
<td>Families were very supportive of the students</td>
<td>Few family members participated with the students. There were limited educative opportunities in the community</td>
</tr>
<tr>
<td>MAYI organizers had a clear follow up after the Alaska trip</td>
<td>Limited time to help organize and focus the students’ continuity efforts. The contextual violence created stress for MAYI organizers, deteriorating the participation levels.</td>
</tr>
</tbody>
</table>

Generally, in San Juan Nuevo Parangaricutiro I observed no apparent continuity in the educative experience as a group. Nevertheless, there were some important isolated actions and reflections that showed an individual degree of commitment and continuity. These individual actions could find fertile ground for continuity. Initiatives of continuity were discussed with the students, but some elements weakened the possibility of continuity; for instance, the social environment and the lack of a solid friendship among participants.
Table 5-4: This table presents some observations, challenges and some possible ways to address them in Ixtlan de Juarez, Oaxaca, Mexico

| Experience continuum challenges after 2011 MAYI Experience Ixtlan de Juarez, Oaxaca. |  |
|---|---|---|
| Students had positive and active intentions to share their experience. Friendship relations were strong to form a group that worked together | Some differences in age and circumstances could weaken the relationships | Continue the strengthening of the friendship relations with common activities for all ages |
| After MAYI some individual actions were taken towards minimizing environmental impacts. | Individual actions were isolated. Local institutions related to the MAYI did not seem to be aware of these actions | Connect actions among individuals. Connect the group and their actions to the institutions. Pursue connections between the students’ group and the institutions. |
| Educative and governmental institutions were supportive of the students' actions, providing spaces for expression. | The educative institutions had their own agenda. Student-centred focus from institutions is needed | Involve a diversity of institutions. Make an effort to keep the institutions fully involved and committed after the educative experience. Provide evidence of students’ development and research to promote their focus on direct student support. |
| Families were very supportive of the students | Little participation from family members; limited educative opportunities in the community | Establish and maintain constant communication with relatives, aiming to include them in the educative process. Empower students to create their own educative opportunities. |
| A clear follow up from MAYI organizers after the trip to Alaska | Limited time to help organize and focus the students’ continuity efforts. | Schedule times and budget for continuity with participants. Consider the continuity of students to be a constant. Use electronic assistance to maintain communication. |

As a general assessment, in Ixtlan de Juarez I observed a clear continuity in the educative experience as the students took actions at different individual levels. Besides, the most valuable actions were made as
groups. The group actions were favourable consequences of the individual willingness to make the conferences a reality, of the friendship developed among the students, of the follow-up from MAYI organizers, and of the institutional support. The continuity of experience was an action that extended the learning from MAYI to other people. Their peers had access to knowledge and reflections that were accessible to the MAYI students in their experience. Observing this, I can state that not only were the students being influenced to continue their experience, but MAYI participants were also extending their influence onto their community.

Section 5.5 has shown that the students’ continuity was expressed with an intention to communicate their learning experience after their trip to Alaska. Two contrasting cases have shown the importance of social influences nurturing and enabling, or constraining this intention of continuity. Correspondingly, it was documented how internal and external factors were fundamental agents of the continuity. Moreover, this continuity process was recognized as a starting point to create social capital based on the group’s cohesiveness and trustworthiness. Therefore, this process is interpreted as being part of the action competence development of the participants. Finally, this section pointed at possible ways of addressing the observed challenges to continuity.

5.6 MAYI Students Extending their Experience

As I previously discussed, the Mexico Alaska Youth Interchange promoted the growth of Mexican students through an educative journey that exhibited a continuum element after the experience in Alaska. In section 5.3 I showed students’ different intentions for further actions, with one of those being consistent among participants: to communicate their experience and share their knowledge. This section shows how MAYI students extended their experience by communicating their memories, knowledge, and intentions to their closest social connections. During the fieldwork I went in search of those messages transmitted to family and friends (F&F), and here I analyse and interpret them through an action competence approach.
5.6.1 Analysis of the communication with F&F

As established in Chapter 3, I was a participant observer in a unique environmental education experience. I used a case study methodological approach for the purpose of this enquiry. For this section of the case study research I used three information sources: firstly, my participant observations in the communities when meeting students’ friends and families. Secondly, I integrated semi-structured interviews with the students who had participated in the MAYI, asking about the conversations they had with their F&F. Finally, I conducted semi-structured interviews with 8 referred friends and family, with whom the students talked about their experience (see Appendix 1). This section focuses on Ixtlan de Juarez, Oaxaca, where, as discussed previously, the conditions for the interviews were favourable.

The answers from the interviews were codified in a hermeneutic unit using the Atlas.ti software (see Chapter 3). The analysis in the hermeneutic unit focused on codifying the topics included in the messages and creating relationships with the action competence aspects of the framework (Eames et al., 2010b). Additionally, observations about the emotional expressions within the messages were recorded. The following sections present the results of this categorization in tables.

5.6.2 Messages communicated

In order to unpack the messages communicated, I interviewed the students and their F&F. The questions searched for evidence of conversations in relation to the MAYI educative experience. In this analysis I identified a number of topics related to the studies and the students’ experience in the MAYI. I interpret in this section the topics with an action quality based on the AC aspects. The messages were identified as relating to the following AC aspects: knowledge, reflection and connections, experience and actions. On the other hand, no example of the visions for the future aspect was identified. This section presents a list of the topics to identify the most commonly mentioned, and the categorizations within their action quality in regards to the AC framework.
5.6.2.1 Topics arising from MAYI experience

The MAYI students talked to their friends and family about a number of topics related to their MAYI journey experience. During the experience the students participated in a series of conferences. In those conferences we elaborated concepts and understandings about science, traditional knowledge and its implementation in natural resources management. Some of the topics from these conferences were evident in the students’ messages. The following table identifies the selected topics:

Table 5-5. Topics identified in the interviews with MAYI students and F&F.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Number of messages containing the topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whales and seals</td>
<td>16</td>
</tr>
<tr>
<td>Cultural issues</td>
<td>12</td>
</tr>
<tr>
<td>Sustainable management</td>
<td>9</td>
</tr>
<tr>
<td>Climate change</td>
<td>7</td>
</tr>
<tr>
<td>Pro-environmental behaviours</td>
<td>7</td>
</tr>
<tr>
<td>Other wildlife</td>
<td>7</td>
</tr>
<tr>
<td>The sun and daytime in Alaska</td>
<td>6</td>
</tr>
<tr>
<td>Forest</td>
<td>5</td>
</tr>
<tr>
<td>Ice</td>
<td>5</td>
</tr>
<tr>
<td>Research topics</td>
<td>4</td>
</tr>
<tr>
<td>The trip and flight experience</td>
<td>3</td>
</tr>
<tr>
<td>Life in Alaska</td>
<td>3</td>
</tr>
<tr>
<td>Indigenous rights</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 5-5 provides a representation of the topics that were mentioned during the interviews with the students and their F&F. The three most commented topics related to messages about whales and seals, cultural topics and sustainable management. This is related with the conferences and discussions held during the MAYI in Alaska. As an example, the whales in particular were a topic constantly talked about. The main reason for this is because historically marine mammals have been deeply interconnected with Inuit culture; we learned about their spiritual connection and the history of hunting, and the ethics and principles behind it. Then, the regulation on commercial whaling for hunting in 1946 turned into a moratorium that affected the aboriginal subsistence whalers. Subsequently,
an Inuit political movement emerged with the goal to recover the traditional rights to hunt whales. Their actions were based on a deep understanding of traditional knowledge and scientific research, up to the contemporary environmental issues and laws concerning the oiling industry that impact whale waters. During MAYI we were presented with images and stories about whales on a daily basis; we were invited to eat and sample different pieces of whale and seal meat, making the experience closely related to these marine mammals. In this way the topic of whales emerged in various meetings, and was analysed from different angles and experiences. Similarly to the topic of whales, cultural issues, sustainable management and climate change were topics constantly analysed from different perspectives and in the course of various presentations.

The following sections relate the topics presented in Table 5-5 with the AC framework aspects. This investigates how the reported messages from the students and their F&F, integrate those discussed topics within the action competence approach. This offers a useful lens to interpret the continuity of the educative experience in terms of action in the community.

### 5.6.2.2 Knowledge and information in messages

This section identifies the topics from Table 5-5, whose only purpose was to share new knowledge or information. Table 5-6 and Table 5-7 show the messages from the students and their friends and family. The most commonly shared topics in these interactions were whales and seals and cultural issues, corresponding to the first two shown in Table 5-5. Both topics were expressed through diverse ideas, manifestations, and new transmitted knowledge.

**Table 5-6. Knowledge messages the MAYI participants expressed to their families and friends, including the involved topics.**

<table>
<thead>
<tr>
<th>MAYI Participant</th>
<th>Topics</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatima</td>
<td>Whales</td>
<td>She mentioned that the most interesting topic she talked about was the weird experience of eating whale. She stated that the experience gave her a sense of pride.</td>
</tr>
</tbody>
</table>
He knew about Inuit people’s pride in their place and how humans treated the animals with respect.

Many of the messages were simple, and contained information or specific knowledge related to the topics previously mentioned. I observed some of the new knowledge being expressed with an emotional reaction of pride and excitement. In comparison, in Table 5-7, it is shown that the
messages were consistent about the topics of whales, culture and life in Alaska. In addition, some included elements of indigenous rights and sustainable management. During the interviews, these inclusions were clearly related to the interviewee's individual knowledge and interpretation of the issues in Alaska.

5.6.2.3 Reflection and Connections in Messages

Table 5-8 and Table 5-9 below show the messages that contained a reflection element in the reported conversations between MAYI participants and F&F. The messages represents a reflection associated with a topic of conversation. The communication would also incorporate some connections with the knowledge.

Table 5-8. Reflective messages the MAYI participants expressed to their families and friends including the involved topics.

<table>
<thead>
<tr>
<th>MAYI Participant</th>
<th>Topics</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atzin</td>
<td>Other Wildlife Whales Sustainable management</td>
<td>She talked to a couple of friends about wildlife. Topics were about hunting caribou, seals and whales. As the friend got defensive about the animals, Atzin talked about how sustainable management works in a community, offering her arguments to reflect.</td>
</tr>
<tr>
<td>Atzin</td>
<td>Pro-environmental behaviour</td>
<td>She narrates her discussions with a friend about pro-environmental behaviour; being more frugal with clothes, not littering, and rational use of water.</td>
</tr>
<tr>
<td>Nelly</td>
<td>Sustainable management</td>
<td>She discussed with her parents and brother an important question for her: “what gives us the right of intervention in the natural ecosystems?” Promoted a discussion with a reflective intention.</td>
</tr>
<tr>
<td>Nelly</td>
<td>Pro-environmental behaviour</td>
<td>Nelly perceived her conversation with friends as promoting a change in their perspective.</td>
</tr>
</tbody>
</table>

Table 5-9. Reflective messages F&F expressed about their conversations with the MAYI participants including the involved topics.

<table>
<thead>
<tr>
<th>F&amp;F</th>
<th>Topics</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother</td>
<td>Pro-environmental behaviour</td>
<td>She reflected about the families in Alaska welcoming her children and her deep appreciation for that. She offered a grateful</td>
</tr>
</tbody>
</table>
reflection about the generosity of people offering their home, food and kind treatment, even when they were foreigners. She connected this to her place and the visitors in her community. As a consequence, she mentioned that now she has and promotes a friendly and respectful interaction with foreigners.

<table>
<thead>
<tr>
<th>Father</th>
<th>Sustainable management</th>
<th>He offered ideas about the value of the diversity of ecosystems in the mountains where he lives, and the associated pride he feels for the Ixtlan environment. In the interview, he reflected about this, when comparing what he learned about the environment in Barrow, Alaska.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Father</td>
<td>Sustainable management</td>
<td>He reflected about the change of place her daughter experienced in a “wild” environment in Alaska. He also highlighted how strangers welcomed his daughter in Barrow.</td>
</tr>
<tr>
<td>Father</td>
<td>Sustainable management</td>
<td>During the interview, he was asked if at the communal assemblies he brought forward any of the ideas or information coming from his children’s experience during MAYI. His answer was negative.</td>
</tr>
<tr>
<td>Father</td>
<td>Whales Indigenous rights</td>
<td>He talked about how the scientist in Alaska determined that the whales were on the edge of extinction, creating a political pressure on the Inuit’s food source. So he highlighted the idea of indigenous people defending their ability to determine the feasibility of hunting them, and they now have the right to do so.</td>
</tr>
<tr>
<td>Male Friend</td>
<td>Whales Culture</td>
<td>He talked about the way the whales are hunted in Alaska. In addition, he mentioned how this is related to some traditions, such as reaching adulthood and using each part of the animal without any waste. But what drew his attention the most was that the purpose of the hunt was feeding and surviving.</td>
</tr>
</tbody>
</table>

The messages exemplified in Table 5-8 show that the students’ conversations had the intention to stimulate reflections and promote understanding of sustainable management and of pro-environmental behaviour. Some of the topics in these reflections included the whales, wildlife, consumption and water use. In Nelly’s example, these reflections and connections promoted are a higher order of thinking, where she brought to her family a deep ethical issue discussed during the MAYI in regards to the management of natural resources.
To expand, Table 5-9 shows that F&F mentioned the same general topics as those recorded by the students. In addition, further topics brought important reflections and connections associated with the MAYI experience. Some of these were about the educative value of the experience in Alaska, the comparisons between the natural environments of the two countries, the science involved in indigenous matters, rites of passage, and cultural survival depending directly on the environment. This messages evoked emotions that I interpreted as pride for their land, gratitude for the human fellowship, and surprise about connecting new knowledge. However, the importance of emotions becomes more apparent in references to experiences, which will be described in the next section.

5.6.2.4 Experience in messages

Table 5-10 and Table 5-11 in this section provide examples of when the conversations between the MAYI participants and their social network transmitted rich and emotional messages about the experience. In this case the emotions were more evidently attached to the narratives of the experience.

Table 5-10. Experiential messages the MAYI participants expressed to their families and friends including the involved topics.

<table>
<thead>
<tr>
<th>MAYI Participant</th>
<th>Topics</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montse</td>
<td></td>
<td>She mentioned that her parents were more susceptible to the narrative about her emotions and perspectives, due to their limited education.</td>
</tr>
<tr>
<td>Atzin</td>
<td></td>
<td>She mentioned sharing her feelings, especially when feeling sad or tired, during the trip to Alaska.</td>
</tr>
</tbody>
</table>

Table 5-11. Experiential messages F&F expressed about their conversations with the MAYI participants including the involved topics.

<table>
<thead>
<tr>
<th>F&amp;F</th>
<th>Topics</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother</td>
<td>Whales</td>
<td>She commented how impressive was that her daughter ate whale, and especially that she did not get sick after eating the raw meat.</td>
</tr>
<tr>
<td>Mother</td>
<td></td>
<td>She expressed great fondness after knowing that people in Alaska were very warm and kind to her daughter and son.</td>
</tr>
</tbody>
</table>
In the previous tables we can observe that the messages about the experience in MAYI highlighted the emotions involved in the journey. Table 5-10 shows few examples from the students communicating their experiences about their journey. These examples did not provide clear details to relate them to any of the topics from Table 5-5. Instead, the narrative of the students was a description of how they shared their experience and realized that their friends and family were receptive to their emotional communication.

On the other hand, Table 5-11 shows examples of some mothers who were clearly emotionally engaged with their children’s experience in Alaska. Some of the emotions these mothers expressed were surprise about eating raw whale meat, and the affection for strangers who were kind to the students in Alaska. In the last row’s example, one mother explained her difficult emotional journey of uncertainty and fear to allow her children to travel to Alaska, and eventually its acceptance, and the letting go of this emotional attachment. This mother’s narrative exemplifies how an international interchange like MAYI can influence the emotional journey not only of the participants, but also of their family members. The value of these examples highlights the influence of the MAYI in an emotional dimension.

5.6.2.5 Actions in Messages

The next Table 5-12 shows the messages with an action quality as narrated by the F&F. As identified on the topics column, the examples in the table identified action referred to as pro-environmental behaviour.
While there is no table that shows the actions promoted in messages from the MAYI participants in this section, the previous Table 5-8 and Table 5-9 show additional examples of pro-environmental behaviour. These gives evidence that MAYI students and F&F referred to messages with an action quality that also have a thought-out and connected quality.

**Table 5-12. Actions in messages F&F expressed about their conversations with the MAYI participants including the involved topics.**

<table>
<thead>
<tr>
<th>F&amp;F</th>
<th>Topics</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Father</td>
<td>Pro-environmental behaviour</td>
<td>He narrated how his daughter incited pro-environmental behaviours in her family. For instance, she made her family reflect on avoiding junk food and littering.</td>
</tr>
<tr>
<td>Mother</td>
<td>Pro-environmental behaviour</td>
<td>She narrated how her daughter made her reflect about separating the rubbish into organic and inorganic. Also, how inquisitive she was about avoiding littering, water waste, and burning the rubbish, due to climate change issues.</td>
</tr>
<tr>
<td>Female Friend</td>
<td>Sustainable management</td>
<td>She narrated an example of a final assignment at University influenced by the MAYI participants' environmental interests. As a team, they did a study about how the downriver communities were dealing with polluted waters. Then they choose to write a proposal for a wastewater treatment plant in their university. At the end, the team considered the idea was beyond their capabilities and changed it for another topic, doing some experiments in recycling oils for soap production.</td>
</tr>
<tr>
<td>Male Friend</td>
<td>Pro-environmental behaviour</td>
<td>He mentioned his dad being interested in recycling plastic bags and cardboard waste at his bakery. His dad reinforced his recycling ideas, and was searching for alternatives due to their conversations about environmental problems, which originated in his friend's participation in MAYI.</td>
</tr>
</tbody>
</table>

The actions promoted in these messages can be considered pro-environmental behaviour. Some of those messages instigated to: not littering, separating the waste, not burning rubbish, and consuming less.
Furthermore, a couple of messages were able to record some associated actions. The first one was part of a university final assignment that intended to implement a solution for a water pollution problem. The second was an effort to reduce the use of plastic bags in a local business. The last example (male friend in Table 5-12) is an example of how the messages could spread beyond one’s close social connections, such as friends and family. It is important to highlight that some of these messages with an action quality had some positive emotions attached, such as appreciation and pride for acting with an environmental awareness. This emotional association is rather important, and associated with the idea that voluntary actions are willed by the emotions relating to an aversion or a passion, while involuntary actions are brought about by an external force (Brennan, 2004).

The last example in Table 5-12 introduces the notion of the extension to a second-degree connection, which refers to the transmission of the message to one or more persons not directly connected with the MAYI students. The next section provides evidence of these extensive influences.

5.6.2.6  Extension to a second-degree connection

This section identifies the messages that were transmitted to second-degree connections, that is, the people not directly connected to the MAYI students, but rather to their friends or family. The evidence was collected from the MAYI participants and their friends and family. The examples in Table 5-13 include the action competence aspect under which the message can be interpreted.

<table>
<thead>
<tr>
<th>MAYI Participants</th>
<th>Topics</th>
<th>Message</th>
<th>Action Competence Aspect</th>
</tr>
</thead>
</table>

Table 5-13. Messages from MAYI students and their F&F transmitted to a second-degree connected person. The columns identify the topics of the messages and the action competence aspect associated with it.
<table>
<thead>
<tr>
<th>Character</th>
<th>Topic</th>
<th>Message</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nelly</td>
<td>Other Wildlife Culture</td>
<td>She knew how her aunt teaches in a high school and has used her as a source of information.</td>
<td>Knowledge</td>
</tr>
<tr>
<td>Sister</td>
<td>Life in Alaska</td>
<td>She admitted talking with friends about her sister’s experience in Alaska. Her talks were about wildlife, as it is a topic she likes, and the Inuit culture; for instance, whale hunting and the research her sister was involved in in Alaska.</td>
<td>Knowledge</td>
</tr>
<tr>
<td>Mother</td>
<td>Life in Alaska</td>
<td>She talked with her mom (participant’s grandmother) about the life in Alaska, with no distinction between day and night as they experience it in Mexico.</td>
<td>Experience</td>
</tr>
<tr>
<td>Father</td>
<td></td>
<td>He explained his enjoyment to share his daughter’s experience when he offers talks and courses as part of his communal activities.</td>
<td>Experience</td>
</tr>
<tr>
<td>Mother</td>
<td></td>
<td>She talked with friends, family and neighbours about her daughter’s trip to Alaska. She expressed much excitement and happiness about her daughter’s experience.</td>
<td>Experience</td>
</tr>
<tr>
<td>Male Friend</td>
<td>Culture Whales</td>
<td>He had family conversations about his friend who travelled to Alaska. He talked about the places, research projects, and the whales.</td>
<td>Experience</td>
</tr>
</tbody>
</table>

Table 5.13 shows some examples of messages being transmitted beyond the close social connections of the MAYI participants. The messages included the most common topics of whales, culture, the life in Alaska and other wildlife, corresponding with the common topics mentioned in Table 5.5. These examples from the interviews do not provide much detail on how the messages were transmitted, and if the second-degree connections would prompt any action. Nevertheless, the messages contain information about the experience and a brief of the knowledge transmitted. These two are part
of the six essential aspects for the action competence in Eames et al. (2010b) framework. These messages are evidence of some aspects from the Mexico Alaska Youth interchange being transmitted to people who did not know the participants. These observations suggest that there is a possibility for Action Competence to be spread through the social networks, just as other complex behaviours have been observed to spread (Christakis & Fowler, 2009).

5.6.3 MAYI seeding action and social capital

Section 5.6 has been exploring how the students extended their MAYI experience to their community. I observed and interpreted the extension to be in the form of communication categorised in different messages to friends and family. These messages had elements of the content of different environmental topics from the MAYI conferences in Alaska. The transmission of these messages was also interpreted through the aspects of action competence.

Some of these messages meant to communicate knowledge, connect information and promote reflections. Some messages were meant to influence the students’ social connections. Furthermore, the experience was extended as part of a personal emotional journey for some parents. In addition, it was observed that the messages were not only transmitted to the F&F but also reached people connected to them in a second degree. In this case study these extended messages and experience played a critical role in starting a conversation at a community level about environmental topics.

The action competence approach cannot be understood as an individual property but at the community level as a communal capability. It is a mutual relationship between individuals in a social structure. It is here where the concept of social capital becomes valuable when integrated with the action competence approach. Social capital is a widely used concept that includes elements of personal and communal resources to improve community life and solve social problems. Social capital incorporates the notion of networks, norms and the trust of individuals to act together and
pursue common goals. It enhances cooperation to search for interest of the
group or community. Social capital is expressed in many forms, such as
individual skills, informal networks and exchanges, and long-term actions.
These assets nurture trust, mutual obligation and collaboration (Colquhoun,
2000; Nelson et al., 2003; Putnam, 1995).

Sander and Lowney (2006) proposed that social capital grows in
communities from individuals to smaller groups, then into larger groups,
and from activities requiring less trust to activities requiring more trust
among the people involved. Eventually, the flow or continuity in action
depends on several factors, starting with the amount and quality of
connections with other people. Motivation is fundamental to participate in
fun or interesting activities, a desire for social contact, or dealing with a
communal problem that has clear personal benefits or disadvantages. It is
also significant for the individual to know her/his participation has an
impact as part of the whole effort. There are no predefined steps to build
social capital or action competence, but it all begins with the level of trust
among the people involved. Social capital and action competence share a
number of similarities. Both concepts are funded in egalitarian processes
and ideas, individuals act based on voluntarism, there is an understanding
of common good, and the actions are taken for this purpose. The collection
of individual skills and knowledge are integrated in the understandings of the
social processes and the ecological awareness (Colquhoun, 2000).

As described in this case study, individual students cannot always
rely on community initiatives or on a group of peers to be able to participate.
Individuals need to learn the skills to instigate and promote a conversation
that includes the community in the reflection and connection of knowledge
based on experiences. These conversations observed in the messages after
MAYI were part of the creation of social capital. Friends and family became
an essential part of creating that social capital to promote action
competence. This formation of social capital was the seed for action. After
the MAYI experience, this means that to be an action competent person, in
addition to the aspects that Eames et al. (2010b) proposed, we need to
understand, promote and consolidate the building blocks to create social
capital, and to transform an understanding of the action competence from an individual property to a social capability.

5.7 Summary

This chapter has argued that the Mexico Alaska Youth Interchange educative experience displayed a temporal element that continued after the trip to Alaska named the experience continuum. During the continuum the participants displayed actions that were interpreted as part of the development of action competent individuals. These actions took place under favourable circumstances, such as a place of possibility and the development of an emotional balance in some individuals.

Additionally, in this chapter I discussed how after the MAYI the continuity of the students’ experience developed differently in each of the Mexican communities. The main difference was the social influences on the students, which worked as supports or constrains on the continuity of the students’ education and actions, and the cohesiveness and trust of the group. Nevertheless, the connections that the students had with other people did not work as regulators only in one direction (i.e. the social ties regulating students), but they flowed in both directions. That means that the students extended their influence to others (peers, friends and family) and were a source and catalyst for action.

These connections were the situations where conversations between the students and their friends and family started. Some of these conversations were transmitted to a larger group, or second-degree connections, where the knowledge culture and experience of the MAYI students was extended to more people. These conversations brought knowledge, reflections, and connections, and promoted actions; all these elements supported the building of social capital and sowed the possibility for targeted actions about environmental issues.
Chapter 6  Discussion and conclusion

6.1 Objective

In this chapter, I provide an overview of the purpose and the main findings of my research to answer the research questions. The overview of the findings section describes and discusses the elements of the action competence framework. I discuss a richer view of each action competence aspect after researching the Mexico Alaska Youth Interchange (MAYI) case study. Additionally, I present a richer view of the Action Competence (AC) by including the concepts of experience continuum and the extension of the MAYI students’ interactions with the community. Finally, a discussion of the implications of this research, the limitations and possible future research is presented.

6.2 Overview of the purpose of this research

The aim of this thesis was to make sense of an environmental education (EE) field project through an action competence approach. I used a case study methodology and as a participant researcher I explored the influence of the Mexico Alaska Youth Interchange educative experience.

The action competence approach was suggested in the late 1990s as an alternative to mainstream EE approaches. The mainstream was focusing on saving the environment through some modification of the behaviour of the students. Conversely, action competence is an EE effort focused on the development of learners’ critical and reflective participation. It is a powerful approach as it aims to benefit the learners here and now, while it has a clear intention to prepare students so they can handle environmental problems in the present and future. An action is the result of the learners’ development of a will and abilities to be involved in environmental issues. Actions can be direct (targeting a particular environmental issue) or indirect as the learner encourages others to get involved in environmental issues. The teachers in this approach do not direct the learners’ actions beforehand; rather, they help discover the possibilities of action. Action competence was
called the new paradigm in environmental education as it has a robust approach from a democratic point of view in education, and it seems much more useful in addressing environmental challenges (Breiting & Mogensen, 1999; Jensen & Schnack, 1997). With this in mind, there is a need to integrate this approach to real life situations, and investigate its efficiency and possibilities in different cultural contexts.

With this reconceptualization of EE, a group of researchers in New Zealand proposed a framework for analysing and developing the students’ AC. The framework meant to counterpart the key competencies in the New Zealand curriculum to teach Education for Sustainability (EfS) (Eames et al., 2010b).

This framework suggests six aspects that support the development of students’ AC. These are: experience, reflection, knowledge, connections, action taking and visions for sustainable future. This framework offers a powerful tool to use in different educative settings, particularly in school-based environments. Considering the democratic approach in AC, and the power to critically examine the individual perspectives of cross-cultural field experiences, the AC framework offers an opportunity to use this tool in non-formal education (Malewski & Phillion, 2009; Malewski, Sharma, & Phillion, 2012). Therefore there is the need to research the framework in diverse settings, particularly international interchanges of non-formal education.

While this approach was growing and maturing, in Mexico, Dr Barraza and Dr Bodenhorn were discussing the new paradigms in science and EE, with the intention of wellbeing, establishing better relationships between individuals, between groups and among the society. Specifically, in the states of Oaxaca and Michoacán, they were creating educative experiences promoting connections between Mexican rural education programs and the students’ life experiences. With time, they conceptualised the case of the Mexico Alaska Youth Interchange (MAYI). This interchange program started in 2006 and finished in 2011. Three generations participated in this time frame. It was a field and cultural experience where
both Mexican and Alaskan students travelled to their peers’ country. In the forest environment of Mexico and the tundra environment of the Arctic, the students were exposed to many lectures and fieldwork with experts on a variety of topics. The experts were elders and keepers of the cultural heritage, many scientists, natural resource managers, lawyers, and government representatives. The diversity of themes ranged from forestry, whale hunting, ice studies, oceanic changes, scientific methods, finding reliable sources of information and many others.

According to the lead researchers, this program aimed to provide a unique educative opportunity to potential young scientists from rural indigenous communities of Mexico and Alaska. The MAYI was a particularly significant case to study, as the students were learning from their own life experience, using scientific and traditional knowledge to integrate their local understanding while considering it within a global process (Barraza & Bodenhorn, 2010; Ruiz Mallén, Barraza, & Ceja Adame, 2009; Ruiz-Mallen, Barraza, Bodenhorn, Ceja-Adame, & Reyes-Garcia, 2009). This made the MAYI a rich, well designed, and a mature example of cultural interchange worth researching. The project represented a unique opportunity to develop an enriched understanding of AC in a real life situation.

In this thesis I documented the study I conducted in the Mexico Alaska Youth Interchange (the educative experience case) guided by the general research question: **How does the understanding of the development of AC be informed by the study of a field educative experience?**

To explore the development of the AC, I used the AC framework as a tool to investigate the action competence approach in a real-life case. As a participant researcher, I took part in the 2011 interchange using a case study methodology. This was a qualitative analysis using data from the participants’ interviews and my observations. I adopted an interpretive paradigm, using the six aspects of the AC framework as core elements to unpack and make sense of the MAYI participants’ interviews. I codified the
interviews with an inductive and deductive process, interpreting the student’s capabilities to be agents in environmental issues within the aspects of the framework.

To understand the development of the AC further, I continued the research after the field educative experience observing the extension and reciprocity in the students’ communities. In this way, I explored the AC development over time and the influences of this MAYI educative experience to the friends and family of the participants. To do so, I visited the communities, participated in the students’ activities, and interviewed a group of friends and family members of the MAYI students. For this part, I used the MAYI educative experience as the source of students’ communication. The messages communicated were explored within the AC framework following the extensions of the MAYI experience with friends and family. In this way, I provide fresh insights into the development of action competence approach identifying elements that can help improve the AC framework for field educative experiences.

The study comprises three stages (the educative experience, its continuity, and its influence from the participants to their friends and family), which I explored with the help of the specific research questions. I introduce first the educative experience, and secondly the participants’ continuity, including their influence on friends and family.

6.3 Overview of the Research Questions and Findings

Initially, two specific questions were used to explore the Mexico Alaska Youth Interchange (the educative experience) in its experiential quality. To explore how the MAYI acted to promote students’ Action Competence I used the six aspects of the AC framework as a reference to understand the elements that were supported in this educative experience. Then, with the analysis, I attempted to find what a field educative experience can reveal about the Action Competence aspects to enable refinement of the AC framework. In Chapter 4 this has been thoroughly explored. These questions guided the exploration of the case study with an AC approach. The following sections summarise each of the
six AC framework aspects, and the main findings from this research. This reveals an example of a group of students developing action competence, and the analysis provides an enriched view of the action competence framework.

6.3.1 Experience

Concerning this aspect, Eames et al.'s (2010b) AC framework explains that the learners should have a diverse range of experiences learning in and about the environment. This should promote the learner’s connections to the situated environment and engagement with sustainability issues by developing the heart/feeling elements.

The analysis of the MAYI revealed that the students appreciated the educative experience greatly. This was relevant for their search into developing actions after the MAYI and their search for new and connected educative experiences – that is, complement their experience as discussed in Dewey’s (1998) concept of experience continuum. Therefore, regarding the appreciation of students, the MAYI developed in many of them an emotional element that was able to connect with consequences.

Not only did the students appreciate the experience, it also represented a challenge for them. This challenge can be interpreted using concepts from Baxter Magolda (2001). The integration of these concepts in the Action Competence Approach helps refine the understanding of the role of experience in the AC framework. A challenging experience, such as the one analysed in this case study, can place some of the students at a crossroad – that is, a place of discontent, a place where participants feel the need to work towards one direction in the crossroad. Then, with a decisive crossroad experience, the feelings and choices developed in commitments to search for a self-definition and self-authorship of their own experience. This commitment is a key element for the experience to be provocative.

Under this interpretation of experience, the MAYI participants changed their perspectives, feeling and commitment towards environmental issues, even years after the field experience. In this way, the students’
identity developed over a continuum. The MAYI was the platform to integrate new knowledge, and the students felt challenged and expressed it in a social environment where they received social recognition (Chryssochoou, 2003). Therefore, according to Baxter Magolda (2001) and Chryssochoou (2003), I interpret the MAYI as a provocative experience that provided an environment where the students felt safe to commit, reflect and work, as they were developing their self-authorship.

In this way, considering that experiences in AC should become provocative, and within its particular temporal perspective, the AC experience aspect can integrate the element of self-authorship. This self-authorship, understood as a continuum, is an essential part of the individual’s capabilities to act.

6.3.2 Reflections

The reflections aspect in the Eames et al. (2010b) AC framework explains how the learners should reflect and be critical in and on actions, and with the learned knowledge, as an essential element to connect between thinking feeling and acting.

From the MAYI analysis, I identified three elements that elaborate on the reflection aspect. Firstly, I identify that reflecting on specific topics related to the experiences. In the MAYI case, a recurrent reflection was on climate change, associated with the visit to Barrow, Alaska. The changes in this region of the world were evident for students because of the conversations with peers, their observations of an extreme environment, the cultural interactions, and the recurrence of the concept being discussed in the lectures.

Secondly, the objects of reflection are mental processes that integrated past experiences and reasoning and helped developing connections to act and solve problems. The MAYI students’ reflections were creating comparisons and evaluations about their experiences and actions. These helped them to value their family, and change their mind about topics such as the choice of profession they were pursuing.
Finally, the change-inducing reflections were comments beyond comparisons and evaluations. Students were questioning and critically analysing their reality including the construction of new arguments. For instance, students were seriously and profoundly considering the value of traditional knowledge for forest management in Mexico. It was an alternative way of viewing a problem, and demonstrated their higher-order thinking (Lewis & Smith, 1993).

Bringing it together, an educative experience promoting action competence should integrate the three elements of reflection discussed above. In this way, the reflections aspect is enriched in the AC framework. These elements of reflection should help to pursue more than the mechanical application of acquired information, but to promote higher order thinking. With a view to evaluating this within the AC framework, a teacher should be a careful observer since a situation that would require higher-order thinking by one person could require only lower-order thinking from another (Lewis & Smith, 1993; Mogensen, 1997).

6.3.3 Knowledge

The aspect of Knowledge in the Eames et al. (2010b) AC framework, is explained in regards to the learner’s understanding of sustainability issues in everyday life. Knowledge about the impact of these issues should be developed in an integrative approach from scientific, social, cultural and historical views exploring multiple ways of knowing. Learners should be developing this knowledge to inform their decisions and actions.

From the MAYI analysis, I highlight that the students expressed two types of knowledge, declarative and relational. Declarative knowledge refers to specific concepts that were mentioned. The most common concepts being declared in the case study were “climate change” and “sustainability”. The relational aspect refers to demonstration of connections between knowledge. Particularly in the MAYI, the concept of sustainability was challenged and problematised. The definition and discussion of the concept of sustainability evolved, leaving some students reflecting and doubting the conceptual information they had before the interchange. The concept was
intensely challenged with the explanation that sustainable activities are not disconnected from unsustainable resources. As the framework suggests, the students were exposed to a diversity of perspectives and approaches.

Enriching the understanding of the aspect of knowledge in the AC framework involves incorporating and valuing the knowledge, both as declared information and as connected understandings. By incorporating the diverse perspectives, including the knowledge from indigenous communities, I suggest that the framework might have to move beyond the Education for Sustainability frame of mind. Education for Sustainability has at the core of its interpretation a notion of a ‘right’ relationship with nature. This core interpretation affects our relationship with nature, including the understanding of its components as resources, therefore conditioning our attitudes towards the environment, including our sense of cultural and personal identity (Bonnett, 2006). Finally, it is important to recognise the knowledge is not an entity separated from the students. Instead, knowledge can be understood in a Freirean way, whereby knowledge is created. The teachers then are performers of a creative act (not a mechanical one) where together with the students, they re-create the knowledge, through collective reflection and action in educative experiences (Freire, 1993, 2009). In this co-creative act, the students can be prepared for action. In the words of Dr Barbara Bodenhorn (MAYI organizer), the students should be taken seriously. For this, considering the continuity of the experience is fundamental, as it will be discussed.

6.3.4 Visions for the Future

The visions for the future aspect in the AC framework (Eames et al., 2010b) refers to the learner developing a vision for a sustainable future, by exploring change with alternatives.

The analysis of the MAYI experience suggests we can observe two kinds of visions for the future for these high school and university students in Mexico. Firstly, some visions were abstract as they were expressing ideas. Considered as general plans to do something, the ideas ranged from long- to short-term vision. Long-term ideas, for instance, were about
participating in the activities of the communal government; short-term ideas were about communicating the experience organising a sort of event (which was held at the University in Oaxaca). This short-term idea in particular proved to become an action, as it will be discussed in the continuity of the experience section. Secondly, some visions were contextual or descriptive of a desired or undesired vision for the future. Most of these contextual visions related to the students’ professional aspirations, and their desire to search for a job or further university studies related to environmental topics and in the local environment.

A richer understanding of the vision of a sustainable future as the suggested aspect in the AC framework needs to incorporate the abstract and contextual visions for the future. It is important to incorporate the learners’ aspirations in the long and the short term. On the other hand, any visions for the future would not necessarily have to be about a sustainable future (as discussed with the sustainability concept in the previous section), but about a relevant future that is part of the learner’s context.

6.3.5 Action Taking

The aspect of action taking in the Eames et al. (2010b) AC framework, is explained in regards to the learner’s skills to plan and willingness to take effective action for sustainability. The actions can be direct or indirect aiming to the cause of a sustainability issue.

Students from the MAYI took actions with direct and indirect nature. A communicative element was at the core of both kinds of actions. The students expressed indirect actions, communicating to friends and family a diversity of messages about their experience, and agitating to take some actions about environmental problems (see section 6.4.2, ‘The MAYI extended to friends and family’). On the other hand, the students expressed participation in cultural and environmental activities when possible. Nevertheless, the direct actions after the MAYI were considered to be part of the continuity of students’ experience (see section 6.4.1, ‘The continuity of the MAYI experience’). It is relevant to say that the direct actions taken were of educative rather than environmental nature. That is, the students
sought to take actions related to their professional aspirations. They sought to continue developing their preparation, for instance by getting into, committing to and complete their university studies. In a shorter-term action, they offered a presentation to their peers, where they discussed important environmental and cultural issues about their identities.

An enriched vision for the action-taking aspect in the AC framework is the consideration of the social and temporal elements of the actions. In the MAYI, the actions were not evident, but they became so after returning to Mexico, for example with the organisation of a presentation that allowed communication with peers, and the personal communication with friends and family. As an educative property, the process of action taking should avoid giving precise direction to the participants’ actions. Regarding action competence, I suggest that an action to continue an educative experience (even if it is not directed to solve an environmental problem) is a valuable action. This continuity of educative actions is a reflection of the students’ will to continue their preparation; this willpower, with time, can evolve into the students’ ability to solve environmental problems.

6.3.6 Connectedness

The aspect of connectedness in the Eames et al. (2010b) AC framework refers to the learner’s understanding of their connection to other people and environment, and to the interdependence of the environment from social cultures and needs. Connectedness leads to relevance, enthusiasm and interest in participating. This understanding should be reflected in the learner’s behaviours as linked to their attitudes and values.

As suggested by the AC framework, three categories of connections were identified in the MAYI students’ interviews. The thinking (heads) category recognised connections between the scientific and cultural knowledge. To understand the connections between people and their environment, the educative experience should allow time for students to identify them. In the emotional (hearts) category, emotions like confidence, pride, gratitude were detected in order to act; also, I suggest based on observations that a balance between challenging and positive emotions is
fundamental and needs to be acknowledged in the educative process. Finally, the **acting** (hands) was actions narrated by the students, where they were able to connect their life experiences and actions, expressing a consolidation of the knowledge and emotions lived in MAYI.

A richer understanding of the connectedness aspect involves all three categories of connections needing to be developed in an interconnected way between the learners’ hearts, hands and heads. Additionally, in order to recognise these connections, the learners should be allowed some time after the educative experience for connections to become evident. To achieve learners’ participation in sustainability actions, these connections need time and an emotional balance of positive and challenging emotions that allows and promotes the students’ will to participate.

### 6.4 Overview of the Research Questions and Findings

Extending the inquiry, I addressed the two other specific research questions back in the Mexican communities. I explored the importance of the experienced continuity in terms of AC through the question of **how the MAYI students’ AC developed over time.** As part of this exploration, the research extended to searching the influence of the students on people they trusted. Led by the question of **how the MAYI students influenced their friends and family,** I searched evidence in the messages communicated. The following sections summarise both questions and are followed by the implications of this research.

#### 6.4.1 The continuity of the MAYI experience

John Dewey (1998) named *experience continuum* a criterion of experience. This category meant to distinguish between experiences that are educative and those that are not. For instance, he identified an educative experience as one that promotes the growth (physically, morally and intellectually) of the individual. Certainly growth might take different directions, and so, for educative purposes he referred to an educative experience as one that creates conditions for further growth. In this way,
the experiences affect for better (or worse) the quality of decisions and further attitudes.

For this case study, continuity refers to the actions that the students performed in connection to the MAYI educative experience. The value of the continuity lies in the search for consequent experiences that have an educative value for them. The continuity also refers to the students’ capacity to communicate and extend their new knowledge over subsequent experiences and over time. The fact that few students’ gave examples of preceding educative experiences suggests that the MAYI field interchange was a major foundation of inspiration for students to continue searching for similar experiences. The trip to Alaska was a rare opportunity to experience an unknown world. This journey excited the students, placed them outside their habitual life, and challenged them in a direction that promoted their growth.

With the experience, the MAYI participants became more sensitive and responsive to conditions that influenced their choices concerning intentions to continue their studies, participate in communal matters, and communicate their knowledge and experience. Attending higher education in university was the most relevant observation in terms of their continuity for further educative experiences. This is relevant as the students belong to indigenous communities in two states with some of the lowest rates of higher education attendance in Mexico, and even less attendance in tertiary education. The careers chosen by students were diverse; this means that, in terms of jobs, university attendance is translated into opportunities to earn a higher income for these individuals (Kattan & Székely, 2014). An educative experience like MAYI created a sense of confidence, which was remembered. Remembering an experience with a confident feeling can provide a sense of agency, increasing success in future school and job opportunities (Lammers, Dubois, Rucker, & Galinsky, 2013; Schacter, 1987). In other words, in many cases the MAYI became a prime episode in participants’ lives; a memory of success and confidence that created a moment in their life where they felt the power to act, or agency.
Many MAYI students chose to continue their studies in the environmental arena. This was not a limited connection to environmental sciences (i.e. forestry, environmental sciences, biology); a diversity of professional choices were made (i.e. medicine, architecture, business management). In this way, the MAYI educative experience contributed to preparing professionals in diverse areas as needed to respond to the environmental crisis (Johnson & Mappin, 2005). Not only the diversity of disciplines is needed, but also the diversity of knowledge, which in this case study meant both the indigenous and the scientific ways of knowing. Incorporating the indigenous ways of knowing from the Michoacán, Oaxacan and Inuit cultures put the relationship of humans with the earth at the centre of the environmental discourse. Therefore, the MAYI was an opportunity for students to reflect and re-create an environmental knowledge with spirituality. With these scientific, traditional and spiritual approaches, the MAYI supported the preparation of students, who will be professionals in diverse activities, and will be able to continue their experiences in regards to the healing of the human-earth relationship (Rich, 2012).

Hence, with this analysis, this research incorporates the notion of continuity of education as part of the principles for the action competence framework. That is, environmental education with action competence approach should foster experiences in education that promote the desire, interest and will to participate to solve environmental issues, and continue searching for other educative experiences in regards to environmental understanding.

Furthermore, the continuity of the experience was detected to have a certain degree of dependence on the social context of the learners. I observed that helping to consolidate a group of students (promoting common experiences and friendship) supports the continuity of actions and their AC. As observed in Michoacán, there was no mature cohesion and consolidation in the student group, and the social environment neither promoted nor demanded the continuity of activities. On the other hand, in Oaxaca, the connection among the group of students was stronger and kept developing.
The social environment at school and the support from MAYI researchers boosted their ability to plan some actions. As a result, the university students in this community led a conference, and the high school students participated in a presentation organised by their school. As an organised group, the MAYI students communicated their experience and messages to connect cultures and environmental problems. This group’s cohesiveness and their actions were interpreted, according to Sander and Lowney (2006), as one step to building social capital, since they communicated from a smaller group to a larger group of students. The findings concerning social capital will be discussed in the next section.

These findings enhance our understanding of the action competence approach as a communal capability beyond an individual ability. Therefore, as educators, it is essential to consider and acknowledge the social supports and constrains that the students experience during their habitual life. If a field educative experience, such as MAYI, which placed the students outside their habitual life, should be able to continue supporting the experience for the students. These influences on the learners are coming from their social ties, but it is also essential to understand that these students can influence the people in their social connections, as discussed below.

6.4.2 The MAYI extended to friends and family

The extension of the students experience is interpreted with the help of the social capital concept. Social capital is defined as a resource that belongs and is derived from people’s social ties. Social capital makes it possible to achieve certain ends that would otherwise not be possible (Morrow, 1999). In this way, social capital concerns social networks and relationships. Through connecting to social networks is possible to make, act and sharing the actions in the world we increase our commitment and connections with the environments (Gauntlett, 2011).

I considered the individuals communication processes as a fundamental part of the development of social capital. That is, after the MAYI, the students not only organised as a group and presented in formal forums, they also extended their messages individually. They initiated
conversations in their community through a non-formal style, namely regular conversations with family members and friends (F&F).

The students talked about many topics and concepts elaborated during the MAYI. The participants wanted to communicate their new knowledge mostly about whales, seals, and cultural topics. They shared their ideas with feelings of pride and excitement. This new knowledge was not only mentioned but also transmitted with the intention to stimulate reflections; it was particularly connected to the understanding of sustainable management and promoting a pro-environmental behaviour. Some students would even bring profound ethical questions to their family’s table, such as “what gives us the right of intervention?”, demonstrating that the messages often incorporated high order levels of thought and reflection in regards to natural resources management.

The family and friends (F&F) mentioned the same general topics as those the students were transmitting. Additionally, however, they talked about topics such as the educative value of the interchange, the science involved to solve indigenous matters, and cultural survival as depending directly on the environment. These were reflected in and originated from the conversations between participants and their F&F. Furthermore, the experience had an emotional impact not only on the participants but on their families as well. Some of the messages were promoting pro-environmental actions with their F&F – for instance, not littering, nor burning rubbish, separating organic waste and consuming less. Moreover, the messages influenced friends who owned a bakery and were trying to reduce the use of plastic bags. In another example, some friends organised a plan to promote better water management at the University as an assignment (although it was never materialised). During the interviews with the friends, I identified in some of these pro-environmental behaviour messages positive emotions, such as appreciation and pride. This association of the environmental actions with positive emotions suggests that these friends were performing in a deliberate and voluntary manner (Brennan, 2004). This connection and insight suggest that students
delivered messages associated with a significative educative experience, and they transmitted elements of action competence.

The influence of the MAYI participants was not limited to their friends and family, but their messages were also transmitted to a second degree in their networks. That is, friends and family were talking to other people who did not necessarily know the MAYI participants. This suggests that, similar to other complex behaviours such as happiness and cooperative behaviour, action competence can be transmitted in a social network, exhibiting a probability of contagion and displaying a three-degrees of influence property (Christakis & Fowler, 2009); that is, the AC can be transmitted to a friend’s friend’s friend. In this way, the capabilities to act are not only influenced by the society surrounding students, but the students also influence their society.

Observing this influence property of students extending their messages becomes a valuable observation for environmental education literature, since the research for social network transmission in EE has been mostly focused on the cybernetic (online) networks rather than on family and community networks (Greenhow & Robelia, 2009; Liccardi et al., 2007; Robelia et al., 2011). In addition, the students extending messages in their community was part of a democratic process, as intended with the AC approach in environmental education (Jensen & Schnack, 1997).

As explained before, due to the cohesiveness of the students’ group and their communication, the building of social capital is interpreted through the cohesiveness. The similarity between this concept and the AC has been described in the literature. Both concepts are based on egalitarian processes and ideas, actions based on voluntarism, and an understanding of common good (Colquhoun, 2000). The case reported here illustrates these concepts in a real-life research. The process of the students getting together was based on an egalitarian process where all participated, not equally but with the same opportunities. The actions performed were based on their excitement to communicate their experiences in a voluntary activity. In addition, the messages the students transmitted had some repercussions for
the common good regarding sustainable management and preservation of the indigenous cultures as part of the necessary knowledge to solve environmental problems.

6.5 Implications of the research

The efforts of the Mexico Alaska Youth Interchange were intense and primarily successful thanks to the efforts of its leaders. It was also an enormous collaboration between people in Mexico and Alaska. And without a doubt it would not have been possible without the small economic support from different sponsors, and the larger and fundamental economic support from the National Science Foundation in the United States of America. Therefore, considering the MAYI was an expensive and highly communal effort to develop, how can this research be relevant to cheaper and smaller efforts in environmental education? That is, how can more discreet environmental education efforts reach the same action competence effects in participants? In my opinion, any environmental education effort with students can benefit by transforming its approach at the design and preparation stage into an AC approach assisted by the framework aspects.

Environmental educators will benefit by understanding the six aspects of AC and incorporating the elements that developed from the analysis presented in this thesis. The preceding “overview of the research” section highlighted these elements in each aspect.

Educators should promote AC by defining a unit of experience and design it as a provocative experience, that is, by integrating crossroads that allow for discontent in students. These moments could become milestones that integrate a practise of the conscious feelings involved, to reason about and understand environmental knowledge. The knowledge should aim to become relational, where students create connections among the different cultural understandings of environment, its problems and alternative visions for change. Emotional awareness promotes courage and enables a commitment towards taking direct or indirect actions. In this design of the experiences, participants should be involved as co-creators of actions, allowing them to feel self-value and consequently motivation and
commitment. These milestones in an experience can be used as a time to reflect, a mental process that integrates past experiences, reasoning of abstract and contextual visions for the future, and helps developing actions to solve environmental problems.

Additionally, the following sections describe 3 relevant implications for this research: the documentation of a non-formal environmental education, the use and refinement of the AC framework in the non-formal education area, and its relevance for the United Nations Global Action Programme.

Previous research has stated that due to the rigidity of the Mexican formal education system it is particularly hard to incorporate EE into the school curriculum. For this reason, many EE programmes are planned as extracurricular programmes or sessions part of a non-formal education (Ruiz-Mallen, Barraza, Bodenhorn, & Reyes-García, 2009). In this context, documenting the MAYI field educative experience provides valuable information supporting the importance of non-formal environmental education programmes offered in rural communities of Mexico.

The action competence framework is a tool originally designed to show the connections between the AC approach to education, the international conceptions of Education for Sustainability, and the New Zealand curriculum. This tool helps teachers to incorporate action competence in the school curricula (Eames et al., 2010a). Using the framework as a research tool to make sense of MAYI revealed the opportunity to use the framework in non-formal education research. Additionally, the integration of the experience continuum and the development of social capital (through the transmission of ideas), which assisted in understanding the development of the AC, reflect the need to incorporate these dimensions to refine the AC framework. With these additions of time and social connections, the AC framework can help teachers, education managers, and environmental educators to prepare educative experiences with the aim to promote students action.
The United Nations declared the Decade for Education for Sustainability (EfS) between the years 2005-2014. The EfS decade meant to “allow every human being to acquire the knowledge, skills, attitudes and values necessary to shape a sustainable future” (UNESCO, n.d.-a) As a follow-up, the Global Action Programme (GAP) was launched for an initial period of five years (UNESCO, n.d.-b). The GAP promotes five priority areas to advance the EfS agenda. This research is directly relevant for priority area action 4: *empowering and mobilizing youth*. This priority area seeks to empower youth by understanding their daily choices and actions, while finding alternatives and innovative solutions (UNESCO, 2015). The MAYI supported the participants to be action-competent and promote critical thinking in relation to solutions that integrate a diversity of knowledge. In addition, EfS demands for research that contributes to the implementation of the GAP by informing and corroborating decisions on which specific activities to design and support (Fischer et al., 2015). In this way, this research shows that programs like MAYI, offering provocative experiences, can empower youth into action. They can also continue the support of the experience, which will support youth’s actions.

6.6 Limitations and future research

Case studies, as all research methods, have limitations. As exposed in the methodology section of this thesis, the research involves interpretations as well as an ethical and moral component intrinsic in judgements (Whittemore, Chase, & Mandle, 2001).

The research in this thesis presented an overview of the application of action competence in a real-life situation. With an interpretive approach in case studies, we need to consider that the same data could be interpreted from a different perspective resulting in dissimilar outcomes. In addition, this study concerns a certain social and environmental context: it is an original reference to an experience of researching the AC concept and framework in non-formal education and a Latin American context, focused on Mexican students in their regional situation. Nevertheless, if a case study for its interpretation and regionalism provides a provisional truth,
this research becomes a relevant example for the particular situation of this region and the educative experience of this case study, becoming the most exhaustive description until contradictory observations develop (Hodkinson & Hodkinson, 2001).

Future research connected to the analysis of this case study can follow the development of an improved version of the action competence framework. Research in significant educative experiences would greatly improve the framework by incorporating emotions and feelings as an integral part of rationality. Additionally, further research could greatly enhance the understanding of action competence with practical implications if inquiring into the promotion of cohesiveness in groups, innovative experiences in education that promote opportunities focused on continuity, and developing social capital intentionally to further understand the nature of action competence in individuals.

Pro-environmental behaviours are usually considered in individuals in isolation (Longhi, 2013). This research added to the literature by providing a case where elements of action competence were transmitted, and this was interpreted as the forming of social capital. This is one of the first observations of the action capabilities in connection with other people. From these observations, it is understood that action competence is not only an individual ability, but also a communal capability. Based on this communal capability suggestion, further research is necessary to understand the process of taking action and its contagion (or influence) in people who are connected (Christakis & Fowler, 2009). For instance, behaviour and action would depend on the structure of the household (Longhi, 2013), but also, as discussed in this thesis, the influences of the group of friends, the family’s history and interactions, and the social regulations established in communities. This would greatly help to understand the different social structures that affect the action of individuals not in isolation.

This research also led me to think of the potential value of enquiry about the role of the body as the learning interface between the individual
and the environment. The body experiences actions and interactions in certain locations and positions. During the MAYI I observed the need for movement in many of the participants. From my perspective, the movement needed was in relation to dancing, exercising the body after many days of staying in one place and with inactive interactions, and moving while thinking in conferences. This can bring a deeper understanding of our interactions with our social and natural environment (Payne, 1997, 2000). In addition, further research with this embodied focus can lead to profound contemporary understandings about action and inaction in an environmental crisis. Further research on the body as part of the educative experience and AC is a promising direction.

6.7 Concluding comment

The Mexico Alaska Youth Interchange demonstrated that a rich experience is indeed fundamental to develop action competence and that ongoing chains of experiences are key in this development. It is also shown that we need to be connected to other people when developing AC. In a network of connected people, each individual is the essence and source of diversity and has the agency to influence society, which is inherently connected. This is also the fundamental source of diversity of actions and solutions of environmental problems.

Jensen (2000) argued that action competence is an ability to be actively acquired on the basis of experiences and not just a skill that is simply received passively. As individuals, we need to have a diversity of experiences in order to create and re-create the abilities to act environmentally. Education, as a process, can provide this variety of experiences. As professionals in education, we have the responsibility to create and pursue meaningful experiences; to generate experiences that seek to co-create understandings of our existence and actions deeply connected with the planet, and to design educative experiences that enable learners to connect to other people (including ourselves) by means of co-creating the experiences.
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Learning Research Initiative website:
http://www.tlri.org.nz/assets/A_Project-PDFs/9245Appendix-D.pdf


Appendix 1

Guiding questions for the students interview, participants of the Mexico Alaska Youth Interchange.

Experiences

What do you remember with more joy?
What did you like the best?
What did you like the least?
What memories do you have of the conferences? What did you like and what did you not?
What do you think about the conferences?
How did you felt in a particular conference?
And comparing, in the fieldwork related to that conference?
How did you feel in the conference with the archaeologists?
How did you feel your learning in the first fieldtrip with the archaeology project?
What was the difference for you between those two experiences?

Reflection

Of all the experiences, and activities, what have you been reflecting on? Why?
Have you changed any idea from what you had before?
What did you feel when changing your ideas?
Do you think there is a climate change in our planet?

What do you feel when you think about it?

Is there any idea that you have given it much thought?

Are you curious about any particular idea?

Have you searched on the Internet (or book) about any of the topics from the interchange during your free time?

**Knowledge**

What are the things that you consider the most important learnings in Alaska?

How do you understand the concept of climate change currently?

Do you think is a natural process or a human driven process?

Do you think that climate change has affected your community?

**Visions for the future**

How do you imagine your future? (Short and long term)

What do you think you are going to be doing?

How do you think you can participate in that future you imagine?

Could you give me examples of something you know or have heard of, that is sustainable and something that it is not sustainable?

Is there any alternative you can think of for change?
Action Taking

Have you participated in any activity in your community?

Have you participated in any activity that tries to solve a problem?

Have you had the curiosity to do something new that you have not been able to do until now?

How are the conditions in your town to be able to carry out this?

Connections

What is it that motivates you in your life?

What do you think it could motivate you to do something to solve an environmental problem?

Students from previous participation in MAYI

After the years of your first experience, what have you reflected the most?

Perhaps the trip and the experience

Any concept in particular

Any belief

About the future

About what could you do to solve problems in your community?

Have you found any connection with what you have experienced since you came back to Mexico?

What do you remember you told your friends and family about your experience?
Have you promote others to take any action in the field of climate change or sustainability?

Do you think you have done some action that inspires any of your friends or family to do something in the field of climate change or sustainability?

Do you think you have said something that inspires any of your friends or family to do something in the field of climate change or sustainability?

**Transmission of messages**

Can you tell me, with whom have you talked about your experience in the MAYI interchange? Who was a family member and who was a friend?

Who else have talked about your experience?

Do you think any of these persons would have been influenced in their way of thinking when you narrated your experience?

What is the topic that you have talked with more intensity about? (i.e. environment, culture, climate change)

Do you think you have promoted any reflection in the people you spoke with?

Is there any interesting story about this that you want to share

Is there anything else that you want to add to this interview?

Thanks for your participation
Guiding questions for family and friends’ of the participants in the Mexico Alaska Youth Interchange.

The following questions are expected to prompt larger conversations about the different topics.

Can you tell me what do you remember about your friend/son/daughter/sister experience in Alaska?

Did the experience and learning from your son/daughter made you think of something more deeply?

Have you used any of the information from your son/daughter learned in Alaska in any of your communal decisions?

Do you remember telling about your son/daughter experience in Alaska to someone else?

What do you remember you talked about with the other person?

Thanks for your participation