Critical Co-design Methodology: Privileging Indigenous Knowledges and Biocultural Diversity (Australia/Mexico)

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ABSTRACT

Indigenous knowledge systems have long been marginalised or excluded from the field of design. This thesis reframes this omission as an opportunity to recognise Indigenous knowledges as a valid method of knowledge/practice production in design. It also addresses the communication and partnership barriers between Indigenous and non-Indigenous people’s worldviews when working towards biocultural conservation and regeneration. The research conceives and develops a new approach: Critical Co-Design (CCoD), a respectful methodology for collaborating with Indigenous peoples, acknowledging the interconnection between relatedness (K. Martin, 2003), Place (Graham, 2006), identity (positionality) and methodology (Martin, 2017) in the field of co-design. The research explores the potential of CCoD to empower Indigenous Young Women (IYW) in a qualitative case study using two sites: Australia and Mexico. Diverse methods were used in this study, including observations, notes of the researcher, reports to the school, biocultural projects (products and services), stimulated recall as a reflection activity with the students, and interviews with school leaders and teachers in Australia and Mexico.

In this research, CCoD integrates elements of critical theory (gender, race, decolonization, Place and critical thinking) by addressing relatedness within Place and empowerment, cultural identity and self-determination of IYW. CCoD extends co-design to a practice facilitation and skill enhancement amongst Indigenous and non-Indigenous people by supporting collaborations within institutions, with the aim of understanding and
recognising IYW’s ways of being, knowing, doing and becoming in collaboration with a researcher. CCoD is grounded in decolonizing research, because it provides a bottom-up point of view looking for opportunities, instead of problems, within Indigenous settings. It also supports the stage of ‘recovery and regeneration of Indigenous culture and ecological practices’ within the four general phases since the intervention of colonisation, according to (Tuhiwai Smith, 2012, p. 91).

The iterative co-reflective process informs the theory of CCoD methodology, developing new knowledge and considering different points of view whilst privileging Indigenous onto-epistemologies. The research is informed by Indigenous students’ co-design practices in collaboration with the researcher in Australia, by teachers’ interviews from two Indigenous high schools in Australia and Mexico, and by the researcher’s point of view. The research is significant in the following interrelated ways: Firstly, CCoD is theorised as a decolonizing approach in research and design. Secondly, CCoD privileges ancestral knowledge, IYW’s experiences and skills and co-designing biocultural projects as practices according to their values and their Indigenous Ecological Knowledge (IEK). Thirdly, CCoD encourages consciousness of the importance of biocultural diversity and IEK conservation and regeneration and finally, CCoD encourages empowerment, self-determination, cultural identity pride and well-being. CCoD, therefore, makes a contribution to decolonizing research in the field of design through its methodology and enactment in the form of a Biocultural Workshop.
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CHAPTER ONE.  INTRODUCTION

This chapter begins by introducing the research and the Critical Co-Design Conceptual Framework. Furthermore, it locates and positions me as the researcher, which is crucial in any research with Indigenous peoples. This positioning operates across multiple places and spaces in the research, and it is premised on relationality. This chapter outlines the research inquiry throughout the background and the rationale, the research questions and the aims. An outline of the chapters is also provided as a framing of the thesis.

Introduction of the Research

In the past thirty years global bio-capacity and environmental crises have been recognised worldwide (Lazarus et al., 2015), yet most of the world’s rich biocultural diversity can be observed in only twenty countries. (Loh & Harmon, 2005). This biocultural diversity refers to the inextricable link between cultural and biological variety, found reciprocally in interconnectedness and interdependence, which are jointly threatened by humankind (Loh & Harmon, 2005; Maffi & Woodley, 2012). According to Sobrevila (2008), Traditional Indigenous Territories encompass up to 22 per cent of the world’s land surface and hold 80 per cent of the planet’s biodiversity.

Since colonisation, and more recently with globalisation, Indigenous peoples have been affected physically, emotionally, linguistically and culturally (Chilisa, 2011; Tuhiwai Smith, 2012). As a direct result of colonisation and its policies and subjugation, Indigenous peoples are one of the most disadvantaged and vulnerable groups in
contemporary society (Markwick, Ansari, Sullivan, Parsons, & McNeil, 2014; Meynard, Dedieu, & Bos, 2012), despite the amount of knowledge and wisdom they hold. Notwithstanding the oppression and subjugation of Indigenous peoples, alternative narratives can be offered in relation to social change. For example, education is an important key factor in liberating oppressed people (Freire, 1970). This research attempts to privilege Indigenous peoples’ ontologies and epistemologies, as these are more connected to and concerned with the well-being of the environment due to Indigenous Ecological Knowledge (IEK). This term is used to describe the ways in which all Entities are co-existing on Country, being related and interconnected physically and spiritually with reciprocity. Indigenous peoples developed a close interdependence between knowledge, land and spirituality (Holmes & Jampijinpa, 2013). Nonetheless, IEK is under threat because, as Tuhiwai Smith (2012) argues, Indigenous peoples have been forced to live and adapt to a modern lifestyle dominated by western beliefs.

According to the United Nations (UN), Indigenous peoples account for approximately 370 million of the world’s population. Of these, 67 million comprise Indigenous youths under the age of 25 (United Nations, 2013) and evidence suggests that they face major challenges, like ongoing injustice, violence, poverty, loss of identity, poor levels of health, malnutrition and lack of professional and personal development (United Nations, 2009). In addition to these existing barriers, young women face the added pressures of gender and race discrimination, and have also been historically excluded from education (Ames, 2013; Cuomo, 2011; Stern, 2009). Education is one of the most effective systems to achieve awareness, empowerment (Freire, 1970) and environmental conservation (Barraza & Robottom, 2008). However, in most cases traditional western systems of education have often proved ineffective because their models do not include the sense of
community or the connection and relationality of people and land in their design. Often, in order to access education, Indigenous peoples need to move off-Country, therefore, the current system does not always consider or provide the opportunity to recognise what the real needs and interests of Indigenous peoples are (Freire, 1970; Tuhiwai Smith, 2012). This study took place in a boarding school that offers Indigenous young women students’ opportunities of empowerment.

For this research, empowerment refers to a complex activity (Ertner, Kragelund, & Malmborg, 2010) that challenges power relations between Indigenous and non-Indigenous people. This research aims at breaking the paradigm that sees Indigenous peoples as a vulnerable group, in order to change old beliefs and see Indigenous peoples as agents of change holding strong roles in contemporary society. Empowerment helps people sharing power and knowledge, and it enables other people to flourish with willingness and to share power with others (Ertner et al., 2010; Freire, 1978; Steen, 2013).

Co-design as a methodology has been used to promote social and reflective practices amongst members of urban societies around projects of design, but very little has been done in Indigenous contexts. Co-design not only promotes empowerment and leadership, but also teamwork, democracy, new skills development, communication and reflexive practices (Parsons, Fisher, & Nalau, 2016; Steen, 2009; Wake, 2013), and there is limited research to date which incorporates the inclusion of Indigenous Young Women (IYW) into the development of co-design practices. This research adopts a critical approach to co-design and attempts to understand Indigenous young women’s strengths and vulnerabilities with respect to gender, race, age and IEK. It addresses the gap in design
knowledge by incorporating the experiences and the positioning of IYW in a collaborative and relational approach.

This research has two types of methodologies that are referred to throughout the thesis: the case study methodology, which is used as a way to collect and analyse data, and the CCoD methodology as an outcome of the research. For this research, methodology refers to the theory (logic knowledge production) and testing of the theory proposed, based on a case study research chosen explicitly for the investigation. CCoD is a methodology designed and created by the researcher, which aims to address the limitations of co-design as a theory and as a practice that, thus far, has not considered the importance of relatedness between people and place, Country and Indigenous peoples. In the Biocultural Workshop developed through this research, the collaboration between Indigenous peoples and researcher/designer enacted the sharing of knowledges, creating mutual learning/understanding and new knowledge together. The result was a generative process of design.

This research proposes an original approach in design, referred to as Critical Co-Design methodology (CCoD) throughout. This methodology which sits between elements of design, critical theory and Indigenous methodologies to engage with issues of Place and relationality, is generated out of CCoD Conceptual Framework. Place is not just physical Country, but a time in place and space (Graham, 2006). This research proposes to show that this critical approach has the potential to address empowerment, self-determination and pride in cultural identity, which is demonstrated in Chapter 4 and 5 where the researcher discusses the outcomes of the Biocultural Workshop and her own cultural identity journey. CCoD is designed to work to facilitate communication, skills and
practices that the participants can use to extend their self-determination, problem-solving and decision making whilst privileging their IEK and wisdom. CCoD is intended to promote flexible, effective and pragmatic communication and collaboration between IYW and the researcher, where diverse ontologies and epistemologies can be recognised and integrated. In this research, CCoD aims at privileging young Indigenous women’s ways of knowing and doing, particularly in conversation with the researcher/designer, harnessing Indigenous Ecological Knowledge (IEK) through a method that acknowledges relationality between people and place, seeking practical and beneficial outcomes. CCoD, in this research, acts as an ethical and collaborative framework that integrates ways of being (ontology and cosmology), knowing and doing (epistemology, learning and practice) (Martin & Mirraboopa, 2003) and becoming (Country et al., 2016). The holistic approach used to conceptualise the empowerment of IYW through co-designing and co-developing biocultural projects (ecological products and services privileging environmental and cultural purposes) in collaboration with the researcher is similar to the approach proposed by Martin and Mirraboopa (2003).

Ontology for CCoD refers as the existence of the nature and structure of reality. Is there one real-world that each of us observes differently through our own senses, or do various worlds exist, depending upon the point of view of the observer (Wilson, 2008). Ontology also refers to the knowledge and values that exist in the world and the way of being in the planet and in each group of the society: ‘The tangible reality that is relatively constant across time and setting.’ Ontology can also denote to the complex and dynamic socio-cultural reality of the world (Strydom, 2011).
Epistemology is the study of the nature of thinking or the ways of knowing. It involves the theory of how we come to have knowledge, or how we know that we know something. It includes entire systems of thinking or styles of cognitive functioning that are built upon scientific ontologies (Wilson, 2008). Epistemology refers to the nature of human knowledge and understanding that can possibly be acquired through diverse types of actions and customs, ceremonies, dances, thus, empirically confirmed, verified or disconfirmed by inquiry, practices, methods, techniques and investigation (Chilisa, 2011). Strydom (2011, p. 11) refers to epistemology to the ‘Access to the reality, the process of cognition and knowledge production’. Indigenous peoples’ epistemologies are mainly qualitative, intuitive, holistic, and spiritual where mind and matter are considered together. It is moral, resilient and is based on empirical observations and accumulations of facts by trial and error, although it is frequently viewed as being inferior, less reliable and as intuitive and informal, lacking the rigorous testing and verifiability that characterise the scientific process (Smallacombe, Davis, & Quiggin, 2006). For Indigenous peoples, Aboriginal epistemology formulated by oral narratives through representation, connection, storytelling and art… epiphanies, ritual, routines, metaphors and everyday experience creates a process of reflexive thinking for multiple ways of knowing.’ Also, it is generally passed on between people from languages, technology, ceremonies, land, practices, listening, sensing, viewing, reviewing, reading, watching, waiting, observing, exchanging, sharing, conceptualising, assessing, modelling, engaging and applying. In the whole system, no person or entity knows all, but each has a set of knowledge to fulfil particular roles. Current Indigenous methodologies have been developed in the last two decades (Chilisa, 2011; Denzin, Lincoln, & Smith, 2008; Tuhiwai Smith, 2012), with values such as being collective, respectful, and ethical and should benefit the community, elements that are essential and included in the CCoD onto-epistemology. The ways of knowing for
Indigenous peoples have many features and are fundamentally relational, in that they incorporate environment-people-cosmos that means that their ontologies and epistemologies cannot be separated.

This research endeavours to demonstrate how biocultural projects and consciousness of the importance of biocultural diversity could empower, and possibly transform, Indigenous Young Women in Australia aged between 12 and 17 in high school (Year 7 to 10). It is through this research and the Biocultural Workshop, IYW may enhance their cultural identity and cultural pride. Cultural identity pride is defined as an individual or self-cultural identity process of inner exploration and it recognises cultural and individual uniqueness by positioning Indigenous individuals within culture and allowing them to acquire self-confidence across relations with other members of the community (Hall, 2014; Rutherford, 1990). This research has the potential to develop consciousness of the importance of biocultural diversity and IEK regeneration and conservation towards empowerment, self-determination and well-being of IYW. Consciousness, or conscientisation, is defined as ‘the process by which students, as empowered subjects, achieve a deepening awareness of the social realities which shape their lives and discover their own capacities to recreate them’ (Darder, Baltodano, & Torres, 2009, p. 14).

For the conceptualisation of the CCoD methodology, the research design was developed through a case study which incorporated mixed methods of observation, chronicle diaries of the researcher, stimulated recall as a reflective practice with IYW, and interviews with the staff of the schools. The research design was applied to two different countries, Australia and Mexico, informed by and, at the same time informing, the CCoD methodology theory. This research seeks to extend co-design and incorporate critical
elements of decolonizing methodologies into a CCoD methodology, informed by existing research on Indigenous Knowledge Systems (IKS) by Indigenous scholars (Graham, 2006; Martin, 2017; Martin & Mirraboopa, 2003; Tuhiwai Smith, 2012). Throughout this research, IKS and IEK terms will be used interchangeably. IKS is also defined as the diversity of onto-epistemologies structures and learning/cognitive processes associated with Indigenous ways of knowing from different Indigenous groups rooted in native cultures (Barnhardt, 2005), more information can be found in Chapter 2. It is then essential to take in consideration Indigenous methodologies from Indigenous scholars, as this is part of the decolonizing approach of this thesis. In articulating CCoD as a methodology, this thesis explores the practical process of collaboration between Indigenous peoples and researcher/designer in developing biocultural projects privileging IYW’s onto-epistemologies, based on respectful and holistic practices.

**Proposal of the Articulation of CCoD Conceptual Framework**

The CCoD Conceptual Framework proposes a way for Indigenous and non-Indigenous people to collaborate together with respect, while privileging Indigenous onto-epistemologies, the relatedness (Martin & Mirraboopa, 2003) and the agency of everything: humans, Entities, the immaterial, knowledge, Country, spirituality, the

---

1. A system of knowledge about life within the universe. It is a way of knowing and being rooted in a deep love and celebration of life itself (Cajete, 2000). Is not a theory, it is a wisdom tradition evolved from the world-experienced (Wilshire, 2006).
positionality through identity (Martin, 2017) and how everything connects on Country and in Place (Graham, 2006) (see Figure 1).

Figure 1. CCoD Conceptual Framework

Within the CCoD Conceptual Framework I developed three different proposals for its articulation: first, the CCoD Methodology encompassing the theory and the tenets of CCoD as the new knowledge, which I will be referring to in this thesis simply as ‘CCoD’. Second, the Biocultural Workshop, which articulates the materialisation of CCoD through lived experiences of the CCoD Methodology and Conceptual Framework. Third, the Journey, the researcher’s and the participants’ journey. All these are relational, and they all have equal agency within the CCoD Conceptual Framework. The research trajectory in this thesis is accumulative and exponential. By this, I mean that the literature builds up, firstly within itself, then via the lived experience of the fieldwork. From this, there is a
further accumulation of literature in order to become robust and to construct a framework that is experiential. This is the research’s relationality.

**My Place: Positionality of the Researcher and Research**

At the time of writing this thesis, I identify myself as an Indigenous Mexican mestiza woman. Throughout this thesis I reveal my Indigenous identity, as in the beginning of the research I was not aware of my Indigenous heritage, and that is why throughout the early stages of the research I could claim Indigenous and non-Indigenous partnership with the Indigenous participants. As Martin (2017, p. 7) states: ‘positioning is vital in an Indigenist research’, or Indigenous partnership, as positioning postulates the relationship between reality and ideology, opposed to an imaginary relationship to existence as proposed by western philosophical discourses. In this research, I position myself as an Indigenous Mexican mestiza, social designer woman, who acknowledges and privileges Indigenous onto-epistemologies and knowledges as a way of fostering resilience and recovery of biocultural diversity. Mestiza refers to the result of biological or cultural mixtures or as De la Cadena (2005, p. 259) describes as empirical and ‘conceptual hybridity’ which reveals alternatives for mestizo subject positions, including forms of Indigeneity.

Researchers themselves regularly ignore the performative aspects of their own being (Law, 2007), however, for this research, it is important to understand the background of the researcher, me, to understand my perspective and onto-epistemology. It is also imperative to locate my relationality and positionality among the different perspectives of the research. Onto-epistemology refers to an ontology and an epistemology that cannot be
separated, the separation of epistemology from ontology is a reverberation of a metaphysical theory that assumes an inherent difference between human and nonhuman, subject and object, mind and body, matter and discourse (Barad, 2003).

This CCoD Conceptual Framework creates a platform for multiple matters, including my own Indigeneity, the respectful intersection of ways of knowing, the methodology itself and lived experiences (my own and others in the research journey), all this underpins the research.

**Researcher’s journey**

Different aspects in the researcher’s life influenced and encouraged her actions and beliefs, experiences, passions, personal and professional life are all interrelated in ways that shape an individual’s worldview, along with ways of thinking, being and doing (Martin & Mirraboopa, 2003). Thus, it is important to unveil details of my own life experiences to understand my perspective and the project itself. Research paradigms are the beliefs that guide our actions as researchers. In my journey, these beliefs relate to the interconnectedness and respect of Relatedness (Martin & Mirraboopa, 2003), Identity (Martin, 2017), Place (Graham, 2006) and Agency (Martin, 2017). These fundamental components shaped my onto-epistemology and CCoD methodology. Research paradigm is the beliefs that guide our actions as researchers, our ontology, epistemology, axiology and methodology (Wilson, 2008). These beliefs include how researchers view reality (ontology), how researchers know reality (epistemology), ethics, values and morals (axiology) and how researchers gain more knowledge and experience about reality (methodology) while positioning themselves (Wilson, 2008).
My personal life is about my beloved ones, family and friends, and it is based on all the love and challenges I have experienced throughout my life. My home-based education has been grounded in giving and receiving love, developing a healthy lifestyle, learning how to respect myself and others, learning resilience, adaptation and problem-solving in a practical and ethical way. This translated in choosing a healthy nutrition, enjoying life, exploring nature and travelling as much as I could to create my very own way of being. Through all the experiences and new knowledge along the way, through learning and sharing different cultures, languages and worldviews I managed to keep finding plenitude, abundance and happiness, while always working towards my goals and on my personal growth despite the many adversities along the way. The unique and thorough education my parents and grandparents gave me, shaped my positive attitude towards life: a realistic, optimistic and dynamic approach in overcoming adversities without harming living entities, thriving through positive visions and actions, which I call a ‘bottom-up life vision’. From my mother’s family, we are 44 people and form my father’s family, 107 people. Among all of us, I am the first one having the amazing opportunity to do a PhD.

In my professional life, I have worked since I was 14 years old. First, as a model, when I acquired self-confidence learning about my embodied performances, then I changed my pathway to a more creative career. I studied a Bachelor’s degree in Industrial design and at the same time I took a cinematographic course that gave me practical skills and higher motor function. Afterwards, I created a company where I designed and developed furniture-sculpture based on biomimicry. While developing and growing this company, I coordinated events such as parades, festivals and concerts, developing a wide set of useful skills such as cooperation, leadership, logistics, design, co-design, management and
project planning while supervising and mentoring a significant number of people throughout. During this time, I became more and more aware of the amount of garbage discarded before, during and after such events, and by furniture companies in general, was enormous. So, I became more mindful about one of the biggest problems of our times caused mainly by western society habits in goods consumption, which is causing a great deal of harm to the environment (Thackara, 2006). This new awareness sparked my decision to focus my Master’s degree in Industrial Design on social and biocultural co-design projects within Indigenous communities.

My interest in cultural diversity started early in life thanks to my mother, who is an ethno-historian and raised me in contact with diverse Indigenous cultures, where I learnt about cultural diversity and respect. Due to that, I came to realise the amount of valuable knowledge and wisdom Indigenous peoples hold and how little recognition we get for knowing and enacting this wisdom. This was the first key realisation in my life, which fuelled a great passion and opened my path to the amazing journey I have been navigating for the past seven years, through my Master’s research and into my PhD.

In my Master’s degree I developed a workshop called ‘Co-design method towards environmental conservation collaborating with Indigenous peoples’, where Indigenous peoples and designers co-designed and co-developed products and services together through harnessing opportunities in the communities involved. Afterwards, I started to co-design and co-develop social and interior design projects with NGOs, companies, schools and cultural spaces using recyclable materials, raising awareness towards environmental conservation and community action for a better quality of life. In this amazing journey, I was invited by Dr Barraza to develop my PhD and support her research with Indigenous
girls in Mexico and Australia. Her assistance in designing my PhD proposal was crucial and remains the core of my project journey.

Throughout this personal and professional journey, my passions have been thriving and increasing. As our own processes of articulating experiences, realities and understandings create our onto-epistemology (Martin & Mirraboopa, 2003), I recognise my love and interest for relatedness, nature, culture, equity, equality, respect, humility, creativity, praxis, reflexivity and engaging critically with the opportunities each Place presents. These are significant elements shaping my worldview as a person and as a designer/researcher. I realise the importance of biocultural diversity, Indigenous peoples and Indigenous Ecological Knowledge (IEK) (Holmes & Jampijinpa, 2013), and how much knowledge and wisdom we can share to thrive together. Thus, one of my main goals in life is breaking the existing barriers between different worldviews and overcoming the deficit of communication and collaboration, in order to collaborate together towards a harmonious and sustainable life, preserving and spreading Indigenous knowledge.

This research looks at the importance of and interconnection between relatedness, identity and Country in Place, elements that are lacking in the field of design and its methodologies, and which I believe are critical and essential to the designing process. This interconnection is presented through Critical Co-Design as a way and methodology of becoming within Place that creates a platform for non-Indigenous ideologies to reconfigure themselves as onto-epistemologies. The relationality between Critical Co-Design, Indigenous Ecological Knowledge, Ways of Knowing and the dynamics of Place as a concept (which is further explained in Chapter Five) underpin the research content and the CCoD methodology.
As a traveller and explorer, myself, I became a citizen of the world, the diversity of countries and Countrys: I have visited and collaborated in, and Places I have lived in, informed and shaped my onto-epistemology. Through travelling I understood the importance of respect, uniqueness and relatedness between Entities and different dimensions, and I found my own Indigenous heritage, which strengthened my cultural identity. This journey is presented in Chapter 5 and revealed throughout the thesis.

**Positioning myself in the research and the CCoD methodology**

As a researcher and industrial designer, I critique how design has not taken into consideration relatedness to, in and with Place (Graham, 2006). In addition, I consider the ways in which the field of design focuses exclusively on the relationship between the product and the user, privileging the appearance and function of the design of material product(s) as the primary aim. I argue that this approach is missing awareness of all that surrounds the design process, including Place and all the Entities, along with the material and immaterial, such as spiritual knowledge. In my ontology the immaterial and the material ‘Place’ underpins the design. Inspired by Martin and Mirraboopa (2003), I propose to incorporate the agency of relatedness and the ways of being, knowing and doing in the field of design and co-design, as well as incorporating CCoD as one way of becoming in Indigenous design research. Through this research and the CCoD

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2 Country refers to a living entity which embodies a reciprocal relationship between people and place (Barrett & Bolt, 2013) in this case I refer to Indigenous Countrys.
methodology, I aim at starting to overcome the gaps in communication and understanding that currently exist between Indigenous and non-Indigenous ontologies. By acknowledging Indigenous peoples’, designers’ and researchers’ perspectives and philosophies, in collaboration with pragmatic experimentation, one can reconfigure the value attributed Indigenous peoples’ IEK.

My position in the methodology is as a researcher, designer, participant, facilitator, observer and a person being observed. My position is relational. I believe that research and partnership through the Critical Co-Design methodology (CCoD) is a beneficial way to collaborate together in a respectful manner through the process of mutual learning, co-discovery, co-design, co-development and co-reflection.

I acknowledge the importance of Indigenous peoples, biocultural diversity and the IEK as elements of resilience which can be harnessed to address and benefit diverse social and environmental concerns and opportunities in real life. For CCoD, the core is Country in Place, which means relationality between people and place (Holmes & Jampijinpa, 2013). In design there is no methodology that incorporates these elements, supporting the constructs, in CCoD methodology all ‘things’ have agency (Martin, 2017), they are all interconnected through a system of relationality (Martin & Mirraboopa, 2003) and the immaterial underpins the material. This relatedness, interaction and collaboration should be based on respect (Martin, 2017), humility, reciprocity, responsibility, safety, love/care, empathy and compassion for each other, which is the foundation of this research.
Foregrounding the fieldwork

As mentioned earlier in this chapter, according to Graham (2006), Place is not just the physical Country but a time in place and space, embracing not only a human element but a spiritual one as well. ‘Place is a physical point in landscape, but also a point in time, an event, an imagining or even a landscape itself (Graham, 2006, p. 7). Place is multiple, layered and flexible. For this research, Place is in an Aboriginal boarding school on Wurundjeri Country, but the IYW and me, the researcher, are off-Country but in our Place. The interviews in Mexico were carried out in a high school on Zapotec Country in Ixtlan de Juarez in Oaxaca. The important aspect of incorporating the feedback and point of view of teachers in the second site is to understand the possible transferability of the CCoD methodology and the Biocultural Workshop as a critical co-design practice in another Megadiversity country.

According to this understanding of Place, I presented my intersectional identity in the schools as a Mexican mestiza woman, a designer-researcher with a social and co-design background who acknowledges the unequal power dynamics developed through colonisation. Phenotypically, I presented myself as a non-European woman with dark skin, dark hair and light-brown eyes. It is important to describe my self-identity and body image as ‘bodies do not merely adapt to circumstance, but create circumstance’ (Saldanha, 2010, p. 3). In addition, my racial epidermal schema can be recognised as a pattern of behaviour

3 In this case, power is an active process that constantly works on our bodies, our relationships, as well as our knowledge construction and meaning of the world, as Foucault’s conceptualisation of power. It is not solely at play in the context of domination, but also in the context of creative acts of resistance across dynamic relationships, shaped by moments of dominance and autonomy (Darder et al., 2009).
or a set of capabilities and constraints. Thus, being an Indigenous Mexican mestiza means that I am the product of a series of complex colonial events, which made me sympathetic with the colonial expressions and injustices that the IYW have been subject to. In the analysis of the research, I brought this situated experience, subjugation and relational positioning to the research.

My way of being respectful of Place and Country, and my understanding and respect for all Entities, human and non-human, is rooted in my upbringing. How my parents raised me shaped my onto-epistemology and my own ontological understanding that ‘time and space are in us’ (Graham, 2006, p. 6). I am aware of being in Place, acknowledging the past, the present and the way of being and becoming with Place as a way of resilience to decolonize my own self.

As this research is focused on IYW in high school, being a female researcher is an advantage, as this research position influences how gender is conceptualised in the research. As Shields (2008, p. 301) observes, an ‘individual’s social identities profoundly influence one’s beliefs about and experience of gender’. As a woman, I understand what women experience as a gender, as well as the dimensions of social identity that we, as women, face (Reinharz & Davidman, 1992). While gender connected the participants and the researcher, it will not be a major focus on the study. Furthermore, English being my second language was another advantage in the research, as for most of the IYW participants English was also their second language. Sharing this perceived disadvantage became an advantage, leading to the creation of non-linguistic forms of communication (body language, ways of knowing, images, painting, design, etc.). This helped bonding
and breaking barriers between the participants and the researcher, therefore avoiding possible imbalances in power relations.

**Positioning participants in the research**

The positioning of the participants is a key principle in Indigenous Australian research (B. Martin et al., 2016). In this research, participants are seen as co-producers, as the CCoD is designed and developed around different points of view. IYW are positioned in this research as autonomous and powerful individual agents rather than powerless victims (Coates, Gray, & Hetherington, 2006) or tourist attractions and historical artefacts (Peroff, 1997). Indigenous women are seen as people of resilience and encouragement to keep Indigenous practices and knowledge alive (Huggins, 1998). This research looks at Indigenous wisdom, strengths, advantages and benefits, seeing Indigenous society as having a strong role and responsibility in society.

**Focus of the research**

The general objective of this research is to conceptualise, explore and articulate Critical Co-Design (CCoD) as a methodology through a case study, in order to privilege Indigenous Ecological Knowledge (IEK) and empower Indigenous Young Women (IYW) within a boarding high school environment in Australia.

**Particular aims**

- Identify how IYW might influence environmental and personal education by enacting skills like cooperation, curiosity, creativity, their cultural identity, mutual learning and reflective thinking through co-designing biocultural projects.
• Recognise potential benefits and engagement amongst IYW during the implementation of the CCoD.
• Analyse how Indigenous students negotiate the different opportunities and challenges associated with Place-based experiences in CCoD project.

Research Question

What are the elements, epistemologies, ontologies and discourse of an effective Critical Co-Design methodology that empowers Indigenous young women?

Sub research questions

1. How might CCoD add to Co-design and how is it informed by Indigenous methodologies?
2. How can CCoD support the design of a biocultural workshop for IYW high school students in a boarding school context?
3. How could mutual learning and enhancement of reflective thinking skills be enacted during the CCoD methodology?
4. What are the tensions and limitations of CCoD?
5. How can CCoD be transferrable to other contexts?

Outline of the Chapters

In Chapter One, I focus on the CCoD Conceptual Framework and on the background and rationale of the research by presenting its aims and research questions. As this research is positioned within an Indigenous research partnership, it is important to position myself and the participants as well. Hence, I will present my ontology through my background and story, as well as through the positioning of Indigenous Young Women (IYW).
Chapter Two introduces and examines the literature and theoretical framework of the four main areas of the research: the environment, Indigenous systems, the co-design field and lastly, critical theory. This particular examination is vital to the research, as it demonstrates where the CCoD methodology is created from, which forms part of the significance of this research.

Whilst Chapter Two considers and presents the literature and theoretical framework, Chapter Three presents the complexity of this inquiry, which deserves a specific qualitative research design which is a case study methodology. This is where I address the approach used to construct the Critical Co-Design methodology. I then present the different types of methods used for data collection and the six different stages of data analysis proposed to inform the theory of CCoD, and I describe the journey to conceptualise CCoD through the methods applied over the process and the data collected on site.

In the articulation and examination of the case study, and development of the CCoD Methodology, the next stage was to enact the methodology. Chapter Four reveals this enactment through the Biocultural Workshop conducted at the Australian site involving the IYW, teachers and researcher.

In Chapter Five, I present and discuss the five themes found in the data analysis, which provide a validity of CCoD methodology in this research. The themes are: first, collaborative resilience. Second, respectful intersection of knowledges. Third, cultural identity and human element. Fourth, outcomes of participants, and, last, limitations of CCoD. I also reveal the Theory of the Critical Co-Design methodology in
Chapter Five, presenting the onto-epistemology, the *Fourteen Axiological Tenets* and the Biocultural Workshop that facilitated the collaboration and communication amongst participants. This chapter also, articulates the interconnectedness of the literature, the fieldwork, additional literature, in order to conceptualise and materialise the relationality of the Biocultural Workshop for the designers/researchers and for students in concert with the *Fourteen Axiological Tenets* of CCoD. These are the significant findings of the research.

Formulating a semi-closure to the research is the purpose of Chapter Six. I position participants in the space of CCoD and formulate the research as becoming. It is a semi-closure as I reveal what further research is needed and possible from this current research into *CCoD methodology privileging Indigenous knowledges and biocultural diversity*. It is here that I also step out from the platform of CCoD to situate my own becoming.
CHAPTER TWO. LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

In this chapter, I examine the literature and theoretical framework that inform the CCoD methodology proposed in this study. Figure 2 shows the four fields of the theoretical framework: Environment, Indigeneity, Co-design and a Critical approach, these serve as the foundation to the inquiry of this research and are considered relational to each other to form the overarching CCoD methodology.

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<tr>
<th>ENVIRONMENT</th>
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<td></td>
<td>Biocultural diversity conservation and regeneration</td>
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<td></td>
<td>Megadiversity countries</td>
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<tr>
<td>(Maffi, &amp; Woodley, 2012; Loh, &amp; Harmon, 2005; Durning, 1992; Mittermeier, Goettsch, 1997).</td>
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<tr>
<th>INDIGENEITY</th>
<th>Indigenous peoples, Indigenous young women (IYW)</th>
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<td></td>
<td>Indigenous ecological knowledge (IEK)</td>
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<td></td>
<td>Indigenous partnership</td>
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<td>Place and Country / Relationality</td>
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<tr>
<th>CRITICAL APPROACH</th>
<th>Critical theory - race, gender, class, education</th>
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<tr>
<td></td>
<td>Decolonizing methodologies and research</td>
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|                              | Empowerment, cultural identity and self-
|                              | determination                                 |
|                              | Education and institutional settings           |
| (Chilisa, 2011; Smith, 2012; Freire, 1970; Martin & Mirraboopa, 2003) |

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<tr>
<th>CRITICAL CO-DESIGN METHODOLOGY</th>
<th>Biocultural diversity conservation and regeneration, IYW cultural identity pride and empowerment</th>
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<tr>
<th>CO-DESIGN</th>
<th>Facilitating practices and skills</th>
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|                               | Collaboration between Indigenous and non-
|                               | Indigenous                                       |
| (Steen, 2013; Malpass, 2016; Lee, 2008). |

Figure 2. Literature Review Sections and CCoD Fields
By co-existing and being dynamically and integrally interconnected in an academic and real context with their potential and limitations, these fields advance the trajectory of the CCoD Conceptual Framework. This research aims to provide legitimacy and an evidence base for the proposed CCoD methodology. The research also intends to show how CCoD can practically be used by Indigenous Young Women (IYW) from Megadiversity countries to support the empowerment of Indigenous people while working towards biocultural diversity.

The *environmental* field is imperative to this research for two reasons: First, by focusing on ecological concerns that raise the profile of current environmental crises affecting biocultural diversity conservation and regeneration. Second, due to the relationality Indigenous peoples have with their Country and their IEK. *Indigeneity* is key to this research, as Indigenous peoples and IEK are privileged, given that IYW are the main focus of the study. In *Co-design* there is a gap in literature where Indigenous peoples, IYW, IEK and the relationality between people and Place are not considered as important as they should be. Co-design is deployed as a practical approach in this research to facilitate interaction between Indigenous peoples and researchers, which in turns leads to co-developing/co-producing new knowledge. Finally, the *critical* approach field has multiple functions in the research. Firstly, it addresses processes of emancipation and empowerment for Indigenous peoples and specifically IYW towards self-determination and enhancement of cultural identity, acknowledging the oppression and discrimination they have faced. Using these insights while co-designing environmental projects creates a thriving process. Secondly, the critical field enables critique of the limitations of western research and education, to change paradigms and bring a holistic, flexible and integral interaction (through collaboration and communication) between Indigenous peoples and
researchers. Thirdly, this research proposes to challenge the roles of the designers while understanding Indigenous peoples’ onto-epistemologies and placing them as co-creators in the design process. Lastly, the critical field and approach is a conscious-raising transformative educative process that enables critical thinking and reflective activities towards action through practices. This research proposes that this can be achieved through facilitating the empowerment of IYW and their IEK while working towards biocultural diversity conservation and regeneration.

The following review of the literature relates to these four fields and highlights the research gap in design knowledge. What emerges from the literature review is the need to incorporate the experiences and positioning of IYW in a collaborative and relational approach with Place, and to overcome the gap that non-Indigenous epistemology has with Indigenous onto-epistemology.

**Environmental Approach**

This section explains the significance of the environmental approach for this research and the importance of biocultural diversity and Megadiversity countries. It also examines how contemporary society causes this environmental crisis and how Indigenous peoples can intervene towards creating a solution through their wisdom, IEK and the relationality they have towards their Country.

**Environmental Problems as Foundation**

In the past 40 years, there has been an environmental crisis, flora and fauna are threatened or have disappeared (Loh & Harmon, 2014). In *The Earth Charter Initiative (1987)*, an
international declaration document supported by the UN, it is explicit that the resilience and well-being of humanity depends on diversity and the preservation of a healthy biosphere with all its ecological systems. Well-being refers to physical, mental, social and spiritual quality of life in relation to the environment, called ecospiritual (Coates et al., 2006; Eckersley, 2005). The global patterns of production and consumption are causing environmental devastation, depletion of resources, climate change, and mass extinction of species (Imhoff et al., 2004; The Earth Charter Initiative, 1987). Additionally, there is insufficient environmental education, awareness and care by society (Cuomo, 2011; Maffi, 2005).

Although some local ecosystems are highly adapted and resilient to variations in climatic conditions, in many cases ecosystems and their communities are being undermined (Cropp & Gabric, 2002; Smit, Burton, Klein, & Wandel, 2000). The global environment with its finite resources is a common concern for all societies. Therefore, it is evident that not only environmental conservation needs to be addressed, but also regeneration. Ecological concerns have prompted various areas of study to seek both theoretical and practical solutions to address these problems. Thus, it is essential to raise ecological consciousness and encourage biocultural conservation and regeneration actions worldwide. This research supports environmental conservation and regeneration through both theoretical and practical approaches.

Many scholars have written about dealing with environmental issues by changing consumption habits in modern mainstream societies. Thackara (2015) advocates about reducing consumption of energy and resources in urban societies for environmental conservation. Indigenous peoples’ biocultural richness and resilience provides valuable
lessons for western societies and this thesis argues that Indigenous peoples and their onto-
epistemologies can inform this shift towards reduced consumption. It is important to
support Indigenous peoples’ actions towards this social and environmental transformation,
as their Indigenous Ecological Knowledge (IEK) acquired over generations promotes
ways of life that cause no environmental harm. Indigenous peoples know how to live with
basic material needs without harming the environment due to traditional knowledge,
however, colonisation processes, modern economy and societal changes have damaged
their culture, customs and biodiversity, to the point that some of this has been lost
(Tuhiwai Smith, 2012).

There is a need to conserve and regenerate IEK, to improve Indigenous peoples’ well-
being as a way of resilience and strength in the world. However, there are insufficient
programs to reinforce IEK conservation and regeneration inside and outside Indigenous
communities, as well as conflicting interests emanating from two different ontological
views, western versus Indigenous. This research argues that these onto-epistemological
differences are a major concern for the current environmental crisis, and in addressing
them, we can find opportunities to solve this crisis.

The environmental crisis not only damages biological diversity, but also affects cultural
diversity, as these two are inextricably interconnected (Maffi & Woodley, 2012). The
continued decrease of biocultural diversity is a major environmental and social problem.
Australia and Mexico are considered biocultural diverse countries as well as two of the
four Megadiversity and linguistically diverse countries in the world (further information
is discussed in the next section), which are more vulnerable to losing biodiversity than
other countries with less biocultural diversity.
Recognising the Importance of Biocultural Diversity and Megadiversity Countries

Biocultural diversity first emerged as a powerful concept in the conference ‘Endangered Languages, Endangered Knowledge, Endangered Environments,’ held in Berkeley, California, in 1996 (Maffi, 2005). This concept originated from the observation and investigation of the extinction crisis (loss of language, traditions, culture, sustainable practices, ecological values, ecological knowledge and biodiversity) caused by socio-economic globalization and political processes. Biocultural diversity refers to: language, ethnicity, spirituality, religion and biological diversity as flora and fauna in the world (The Index of Biocultural Countries is also based on birds/mammals and plant species only) (Loh & Harmon, 2005; Maffi & Woodley, 2012).

Cultural and biological diversity have been inextricably interconnected (Maffi, 2005), but it was only three decades ago that transdisciplinary researchers in academia began to study these fields and realised that there is a need to address issues of biodiversity conservation as well as cultural conservation. ‘The ongoing worldwide loss of biodiversity is paralleled by and seems interrelated to the extinction crisis affecting linguistic and cultural diversity.’ This suggests dramatic consequences for humanity and the earth (Maffi, 2005, pp. 1,3).

According to Maffi (2005), there is a significant body of literature that analyses how Indigenous peoples encoded and transmitted the characteristics of their local landscape and ecosystems, as well as their flora and fauna in relation with their sustainable practices through their Indigenous languages, which is called linguistics ecologies. There are more than 6,900 languages currently spoken on Earth, more than 4,800 occur in regions
containing high biodiversity (Gorenflo, Romaine, Mittermeier, & Walker-Painemilla, 2012). Crucially, the biggest worldwide concentration of biocultural diversity manifests within Indigenous communities, therefore it is imperative to recognise the value of IEK. In many cases IEK, which is further elaborated in the next section, is transmitted and developed through Indigenous languages and practices. For the purposes of this research the concept of language is critical as most of the participants speak at least two languages.

Harmon (2002), declared that diversity in nature and culture is ‘the preeminent fact of existence’, the basic condition of life on earth. This investigation supports biocultural diversity conservation and regeneration with cross-cultural practices between Indigenous and western societies. Similarly, Mühlhäusler (1996) emphasises that access to Indigenous Knowledges perspectives is best gained through a diversity of languages and forms of expression. To support the biocultural concept, Loh and Harmon (2005) developed an index of the 20 highest biocultural countries worldwide, where Mexico and Australia were placed 11th and 12th respectively.

The term Megadiversity countries refers to a group of 17 nations (Mittermeier and Goettsch (1997), including Australia and Mexico, which contain more than 70% of the Earth’s biodiversity and associated traditional knowledge, as identified in 1998 by Conservation International. Furthermore, as established by Durning (1992), six of these 17 centres of biological diversity rank highest in cultural diversity compared to the rest (this index was based on the number of languages spoken as in Durning’s Venn diagram). These countries were Indonesia, India, Australia, Mexico, Zaire and Brazil in 1992.
However, this research has used more recent data based on the Loh and Harmon (2005) index. In this updated diagram, Australia and Mexico are among the four countries with the highest cultural and biological diversity in the world (as depicted in Figure 3).

**Highest cultural diversity** - Countries where more than 300 languages are spoken. (the number beside the country is related to how many languages are spoken according to the Loh and Harmon (2005) Index).

**Highest biological diversity** - The 10 highest biological diversity countries based on the Loh and Harmon (2005) Index

Figure 3. Highest cultural and biological diversity countries 2017, based on Loh and Harmon (2005) index.

**Indigeneity**

Privileging Indigenous peoples, their onto-epistemologies and IEK specifically in relation to Indigenous Young Women is the main focus of this investigation. Thus, Indigeneity is crucial. This section describes fundamental Indigenous ways of knowing, general information about Indigenous peoples’ ontology and epistemology, schooling, methodologies, and the positioning of Indigenous women in relation to the ecology and society. For this research Indigeneity is described someone who is Indigenous or has Indigenous heritage, which is inclusive of all first peoples - unique in the own cultures -
but common in our experiences of colonialism and our understanding of the world (Wilson, 2008). The term Indigenous research, I am referring specifically to research done by or for Indigenous peoples.

**Indigenous peoples worldwide**

According to the United Nations (2013), Indigenous peoples account for approximately 370 million of the world’s population, representing 4,000-5,000 cultures (Durning, 1992). Indigenous peoples have been the most vulnerable and disadvantaged in society due to colonisation, imperialism, globalisation and capitalism (Carpenter, 2014). Some consequences have been poverty, inequality, discrimination, racism, violence, restricted opportunities, dispossession of their lands and resources, lack of information, deficiency of education, malnutrition, deficient health assistance, less access to quality health care and preventive services, environmental problems, lack of access to safe water and lack of integration into dominant cultures (Carpenter, 2014; United Nations, 2009).

This research proposes a bottom-up approach based on the understanding that Indigenous wisdom and strength have advantages and benefits for society and the planet. In general, Indigenous societies hold Indigenous Ecological Knowledge (IEK) which can be acquired through living on Country with years of observing Country and following culture and tradition. In this context, nature, culture and society converge (Maffi, 2005), as discussed further in the next section. However, dominant cultures have pushed them into racial, sexual, spiritual, legal, political, economic and social hierarchical orders imposed upon them by the advent of colonisation, globalisation and capitalism (Sandoval, Lagunas, Montelongo, & Díaz, 2016). The effects of colonisation disrupt and often destroy
Indigenous peoples’ customs, traditions and IEK. Durning (1992) claims that the world's dominant cultures, or western societies, simply cannot sustain the earth's ecological health without listening to and learning from the world's endangered cultures. Supporting this claim, Toledo (2003, p. 80) states that ‘The world's biodiversity will only be effectively preserved if the diversity of cultures and vice versa is conserved’. Indigenous communities represent as much as between 80 to 90 per cent of the world's cultural diversity (Toledo, 2003), but Indigenous languages, arts and cultural practices are in various states of crisis, and their survival is a matter of crucial importance to peoples’ diversity. Within this context, as previously stated, this research aims to support the participants in advancing the recognition of their values of biocultural diversity through CCoD.

Indigenous youth have an essential role in the preservation of knowledge in Indigenous communities. There are 67 million Indigenous youths under the age of 25 (United Nations, 2013). Evidence suggests that Indigenous youth face many major challenges such as continuing injustice, violence, poverty, loss of identity, poor levels of health and lack of professional and personal development (United Nations, 2009). In addition to these barriers, Indigenous young women face added pressures due to gender discrimination (United Nations, 2009).

In 2018 in Australia, there were 761,300 Aboriginal and Torres Strait Islander people (ABS, 2018) accounting for 3.5% of the total Australian population (Carpenter, 2014). Within this cohort, there are 326,996 Aboriginal and Torres Strait Islander women living in Australia whom account 50.4% of Aboriginal people, accounting for 3% of the Australian female population. The ABS states that almost half (45%) of Aboriginal and Torres Strait Islander females are aged less than 20 years old. Aboriginal women
experience poorer health than other Australian women (Department of Health and Ageing Australia, 2010; Fredericks, Adams, Angus, & Walker, 2011). Many suffer health problems, with significant implications related to dispossession, forced removals from family, racism, marginalisation, exposure to violence and harsh weather or unhealthy resources (Fredericks et al., 2011). Aboriginal children tend to be removed from their communities for the entire school season, and thus prevented from speaking their languages and practising their ceremonies in respect for Mother Earth and their ancestors. Separating the children from the grandparents and elders has resulted in the loss of IEK (Wavey, 1993). Part of their IEK is language that is endangered and some of it lost, ‘Many Indigenous languages are officially dead, with fewer than a hundred speakers’ (Tuhiwai Smith, 2012, p. 148). This loss of language can disrupt the relationality between people and Place. One of the aims of this research is to highlight the importance of Indigenous languages and the significance for biocultural diversity conservation and regeneration. Nowadays, Indigenous role models are indispensable to inspire good values in Indigenous youth. ‘Aboriginal people believe that the challenge in education today is to prepare their children to be able to maintain their own cultural identity’ (Huggins, 1998, p. 113).

In Mexico the estimated Indigenous population, according to Consejo Nacional de Población CONAPO (2015) and Instituto Nacional de Estadística y Geografía INEGI (2010) data, is 13.7 million people, of which approximately 6.9 million are women, belonging to 62 different ethnic groups.

This research supports the Declaration on the Rights of Indigenous Peoples (2007) by the UN General Assembly, in which the Convention 169 on Human Rights of Indigenous and Tribal Peoples in Independent Countries, in the fourth Constitutional Article in paragraph
A, envisages preserving and enhancing Indigenous languages, knowledge and all the elements that constitute Indigenous culture and identity, as well as preserving and improving habitat and integrity of their lands (CENADEH, 2012).

**Indigenous peoples’ ontology and Indigenous Ecological Knowledge (IEK) as Powerful Tools towards Biocultural Conservation and Regeneration**

Cultural environmental heritage is known by different terms, such as IEK, Traditional Ecological Knowledge (Berkes, 1993), Indigenous Knowledge (Stevenson, 1998), Traditional Knowledge (Abele, 1997), Traditional Ecological Knowledge (McGregor, 2005), Traditional Environmental Knowledge (Johnson, 1992) and Aboriginal Traditional Knowledge (Smallacombe et al., 2006). As this research focuses on biocultural diversity protection, conservation and regeneration, the term I will be referring is Indigenous Ecological Knowledge (IEK).

IEK is defined as a holistic, local and collective knowledge of beliefs, traditions, values and ways of knowing and doing, which developed from the experience of local groups of people in a specific place around environment and nature. This knowledge has been gained over generations and centuries of living in close contact with nature, land and spirituality, and in many cases, it has been resilient and flexible to the ever-changing environmental conditions. IEK has generally been transmitted from generation to generation through verbal communication (language), practices (ceremonies, rituals, music, dance, proverbs, storytelling, yarning, hunting, arts and crafts), technology, community laws, and ecological and agricultural practices. The above definition was generated by the researcher.
specifically for this thesis, based on the work of previous scholars who have contributed to the definition of IEK (Abele, 1997; Berkes, 1993; Johnson, 1992; Smallacombe et al., 2006; Toledo, 2003). IEK is based on mutual well-being and sharing, in a way that fosters environmental respect, conservation and the mutual survival of human and non-human ‘Entities’ (Martin & Mirraboop, 2003, p. 207) such as waterways, animals, plants, climate, skies and spirits. Different Indigenous knowledge traditions share some values and spirituality practices, which differ from place to place and are localised, relating people to their place in their community and their Country (Smallacombe et al., 2006). Indigenous peoples believe that Country is not only the land and the people, but it also includes the Entities that are relational to each other (Martin & Mirraboop, 2003).

Holmes and Jampijinpa (2013) conceptualised five different general categories to enclose IEK within Indigenous onto-epistemologies as a relational perspective of Indigenous peoples: law, skin, language, ceremony and Country. Law indicates how the environment and humans can live in harmony, physically and spiritually. Skin represents a kinship system, a system of relatedness, connectedness, roles, functions, boundaries, limits and how things integrate with one another. Language is the extensive vocabulary used in communication (verbal, ceremony, body movement and language, sounds and nature) with the natural world, and is therefore essential to expressing all the nuances of IEK. Ceremony is a critical aspect and consists of rituals as a way of education and unity, and it has different levels, comparable to grades in western education. Finally, Country, which means home and identity, is defined by its connections with the other elements and various social, spiritual and cultural relationships. Indigenous peoples do not consider land merely as an economic resource as the western ontology does, or, as K. Martin (2003) describes, as raw material for the economic growth of society. Under Indigenous worldviews,
Country is the primary source of life that nourishes, supports and educates. Country/land is not only a productive source, a nation or a state with its own form of government and located within a particular territory as in western worldviews (Hsu, Howitt, & Chi, 2014), but it is the centre of the universe, as ‘environment-people-cosmos’ (Hsu et al., 2014, p. 370).

IEK is often flexible, adaptable and innovative because of its holistic approach, which western science often does not take into consideration, and as a result ‘Indigenous knowledge systems are completely isolated from Western knowledge’ (Breidlid, 2009, p. 142). IEK investigations are almost always in scientific fields, but some are in social fields, like ecology, biology, botany, ethno-biology, medicine, technology, common property, environmental ethics, political ecology, education, environmental history, ecological economics (Berkes, 2004). For instance, botanical biology focuses on documenting taxonomies and identifying new species with an economical and medical potential usage and education focuses on environmental knowledge acquisition and strategies while working with Indigenous adolescents, assessing IEK and socio-demographic characteristics and Education for Sustainability (EfS) (Ruiz-Mallén, Barraza, Bodenhorn, & Reyes-García, 2009).

Indigenous and local communities play a significant role in conserving substantial areas of high biocultural value, conservation of IEK is essential to human resilience and it is widely recognised, being critical to the development of effective and meaningful strategies to address social-ecological crises (Parsons et al., 2016). Locality is not isolated from global and vice versa, there is a close interdependence between the two (Toledo, 2003). In most cases, IEK is transmitted by elders, generation by generation, they may assume
responsibilities to mentor youth by passing on wisdom or leading certain ceremonies (Sandoval et al., 2016). Younger generations, in turn, are responsible for learning actively from the elders about the non-human, spiritual, and ritualistic dimensions -holistic scopes- of the community and its ontology (Mechielsen, Galbraith, & White, 2014). The cosmology of Indigenous peoples is made up of living, nonliving, and spiritual beings which are inextricably related, this is a representation of ancestral or Indigenous knowledge systems (Martin & Mirrabooap, 2003; Odora Hoppers, 2002).

Despite this important role, most Indigenous young generations are vulnerable and often forced to leave their traditional communities and move to urban areas to pursue employment or education opportunities (UN General Assembly, 1999). Many Indigenous peoples are removed from their Country, and without Country they cannot follow customs and practices. This can have devastating effects on their sense of self-esteem and cultural identity and may lead to a range of serious mental, health and social problems, such as depression and substance abuse (UN General Assembly, 1999). Thus, Indigenous youth requires special attention in order to recover, preserve and safeguard their cultural heritage and enjoy free access to their IEK, lands and sacred sites (UN General Assembly, 1999). This investigation proposes to revitalise IEK and ways of knowing from Indigenous youth. Even though they might be off-Country in a boarding high school, many of them still have contact with their Countries, as they travel back to their communities for school holidays. CCoD aims at facilitating the preservation of cultural heritage through enhancing and developing their cultural identity pride and self-esteem, by moving towards empowerment and self-determination through the respectful intersections of ways of knowing whilst valuing the lived experience of Indigenous youth. Self-determination focuses primarily on three innate needs: the needs for competence, relatedness, and autonomy (or self-
determination) (Deci & Ryan, 1991) through motivation. Self-determination also is presented in Indigenous discourses as principles of cultural sensitivity and community control (Kowal, 2008).

IEK is under threat because of the lack of opportunities for young people to keep learning, practising and respecting the knowledge of their elders (United Nations, 2013). It is imperative to promote conservation, awareness and environmental practices to foster the interest of Indigenous youth in acquiring IEK from their communities. Furthermore, it is crucial that researchers value Indigenous wisdom and knowledge systems, in order to tackle everyday environmental challenges of biocultural diversity conservation and regeneration and find solutions together.

**A duality of Indigenous Women, the Dichotomy between Vulnerabilities and Strengths**

Even though Indigenous women have strong roles and responsibilities in their communities (Huggins, 1998), and in most cases they are pillars in both households and IEK dissemination, they are one of the most vulnerable groups in society. Women have historically been subject to violence, both physical and emotional (Carpenter, 2014; United Nations, 2009). Specifically, IYW have suffered from systemic patterns of violence, discrimination, dominance and inequalities based on race, class, ethnicity, gender and age (racism, classism, sexism). Indigenous women have not only suffered due to colonialism and sex discrimination of men domination, but also to non-Indigenous females (Chilisa, 2011; Huggins, 1998). Indigenous feminism addresses the recovery of their own identity, culture, inclusion and power in society, and their release from the
condition of slavery, servitude or patriarchal authority (Allen, 1999, 2015). Feminism is located in the construct and habitus of colonialism. Therefore, I will use the term ecowomanism which is explained further in this section.

This research aims at overcoming these vulnerabilities, oppressions and discriminations by supporting the development of IYW’s personal, professional and educational environment, along with critical thinking. Critical feminist theorists agree that social criticism has to move between history and practice, culture and society, present needs and future emancipation, as well as between environmental approaches (Allen, 2015). The oppressive social structures make environmental impacts even more disruptive because women’s capacities are disempowered (Denton, 2002; Glazebrook, 2011). This research is focussed on IYW at high school age, who, as discussed, are the most vulnerable within the already vulnerable Indigenous communities. Several critical theories mention the concept of human agency as an aim to emancipate oppressed people. Human agency is defined as the capacity of human beings to make choices and have the conditions, or state, of acting or exerting power with soul-consciousness. It is also defined as the capacity to exercise control over one’s thought processes and motivation, action/effect processes operate through mechanisms of personal agency (Varela, 1999).

The analysis of colonialism is a central tenet of Indigenous ecowomanism, focusing on their traditional roles, rights and responsibilities (Tuhiwai Smith, 2012). The second wave of feminism (in the 1990s) brought along with it ecofeminism and ecowomanism, both

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4 Vulnerable and marginalised people are often described as groups who have little access to power. Vulnerable populations are also marginalised from power, but are considered particularly vulnerable because they have the less individual agency to provide informed consent (Tuhiwai Smith, 2012, p. 207).
focusing on the perception of environmental concerns from the point of view of marginalized women, with the difference that ecowomanism is from the perspective of woman of colour, i.e. women from Indigenous or multiracial backgrounds (Denzin et al., 2008; Harris, 2016). Ecowomanism is focused on a race-class-gender woman approach of environmental justice, which for this purpose are referred to as Indigenous women. This movement began in the field of health around Indigenous women living in unsafe and environmentally toxic communities, then it moved towards incorporating the connections and interrelatedness between spirituality and nature (religion, gender, ethics and ecology) to reinforce wisdom and earth ethics as an environmental justice movement (Harris, 2016). Ecowomanism embraces a fluid understanding of nature as sacred, element through which Indigenous peoples honour women’s wisdom of the environment. Ecofeminists argue that women’s role of caring for children may leave them more inclined to care for the planet, positioning them closer to nature and feminist peace activism (Moore, 2008).

Australian Indigenous women have many relationship-based roles as mothers, grandmothers, aunts, sisters, daughters, wives and partners, and in households they most commonly hold the main responsibility for looking after the health of other family members (Department of Health and Ageing Australia, 2010; Fredericks et al., 2011; Huggins, 1998). Huggins (1998, p. 23) claims that Aboriginal women have been independent despite adversities: ‘Aboriginal women have always enjoyed a very large measure of personal authority, personal responsibility and personal interdependence, and (we) have been able to fend for ourselves and our children despite the odds against us’. Aboriginal women are seen as people of resilience and encouragement in keeping Indigenous practices and knowledge alive (Huggins, 1998). Research finds that in some places in diverse countries, communities are run by matriarchate, such as in Southern
Mexico (Oaxaca) and some communities in Australia. Matriarchate means that the woman/mother is the central pillar of the family and society, mothers are the guardians of traditions and IEK and they manage the economy of the family (Suárez, 2009).

The philosopher White (2014) has studied the responsibility and leadership of Indigenous women towards their communities and environmental conservation. Even though his study reveals that not all Indigenous women share this view, he finds that at least for some Indigenous women it is crucial to take actions towards increasing their consciousness of biocultural conservation and sustainability practices. Lawson (2010), in support, reveals that when Indigenous women are skilful, this approach improves their economic and social position, preserving and strengthening their culture, heritage and traditions, and allowing them to create a business model which is sustainable for them and their communities, where they play a fundamental role in the design of products or services. Although not all Indigenous women take environmental responsibilities in their communities, traditionally most of them live close to the land (White, 2014), hence they may be acute observers for local manifestations of ecological changes, and possess key insights for understanding the best strategies to adapt and be resilient within their communities. Thus, scientists and policy-makers have a political responsibility to include Indigenous women’s knowledge in their research, planning and other empirical work (Figueroa, 2011; Glazebrook, 2011; White, 2014). This research has wide significance in supporting these matters in collaborating with IYW, privileging them and their IEK. White (2014, p. 13) also states that ‘Indigenous women have capacities for unique forms of collective action that can influence adaptation and mitigation’. Thus, CCoD offers Indigenous women the opportunity to actively perform in environmental projects mixing their IEK and environmental practices in order to develop their own community and
develop biocultural conservation and regeneration practices to serve as stewards of their own environment and culture.

Recently, Indigenous women around the world have been involved in high profile decision making about the future of Indigenous peoples, as well as holding critical roles in government (Denzin et al., 2008). Furthermore, Indigenous women worldwide do not only participate in decision-making, but also act as pillars in their community, taking part in the planning and development of services (United Nations, 2009). A breakthrough emerged during the Global Conference on Indigenous Women, Climate Change in 2010, with the Mandaluyong declaration. Eighty Indigenous women from 60 Indigenous nations, in collaboration with experts in diverse fields of study, discussed multiple ways in which Indigenous women’s cultural responsibilities and social situations put them at great risk from ecological impacts. The priority of the Mandaluyong declaration, which supports this research, is to provide a call to action to ‘Reinforce Indigenous Women’s Traditional Knowledge on mitigation and adaptation and facilitate the transfer of this knowledge to the younger generations and enhance traditional community sharing and self-help systems...’ (Mandaluyong Declaration, 2011, p. 300). White (2014) interprets the Mandaluyong Declaration as a unique way through which Indigenous women can take collective action to support the collective persistence of their communities. However, action plans, investigations and arguments show that there are other methods of collective action through Indigenous methodologies (Chilisa, 2011; Denzin et al., 2008; Tuhiwai Smith, 2012). In this research, CCoD proposes a decolonizing approach incorporating IYW points of view through collective action in support to the principles of the Mandaluyong Declaration.
While there are vulnerabilities and oppression, there is also strength. Even though race, gender and age are three critical factors that are seen as strengths for this research, they can also be seen as a vulnerability in most of the Indigenous communities and contexts (Huggins, 1998). There are many strengths in being an IYW, as Indigenous women's relationality encompasses principles of generosity, empathy and care that connotate ideals of respect, consideration, understanding, politeness and nurturing (Martin & Mirraboopa, 2003). They are also characterized by being located in rich natural environments, where nature is sacred, where cooperative, egalitarian and peaceful values are found (Suárez, 2009). As Barraza and Pineda (2003) state, high school students represent an important sector of the world’s population, many of them will soon enter the workforce, and some will hold key decision-making positions. Therefore, there is a strong need to explore how high school IYW from Megadiversity countries can develop environmental practices, skills and decision making in order to empower their role as women and leaders in their communities and society. This research will endeavour to privilege and empower IYW from high school towards cultural identity pride and biocultural conservation and regeneration, through co-designing biocultural projects in collaboration with the researcher.

As Cuomo (2011, p. 5) states: ‘within nearly any society the poorest and most exposed includes disproportionate numbers of females, people of colour, and children’. This research focuses on IYW, tackling gender, race and age disadvantages as some of the most vulnerable groups in the entire society (Díaz, 2006; Paloma, 2002), aiming at transforming their vulnerabilities into an opportunity through valuing their knowledge, experiences and skills.
High School Education System in Indigenous Communities, Breaking the Limitations of Education Structure with Indigenous Methodologies

This research also critiques the limitations of traditional education systems, as the knowledge globalisation structure that is taught in most Indigenous communities nowadays does not consider Indigenous Knowledge Systems (IKS), for they were omitted from history textbooks (Odora Hoppers, 2002). This research, and CCoD, argues how western education can change towards including more around Indigenous peoples’ needs, opportunities, challenges and desires through a new approach which supports education as a way of reflective thinking and consciousness, moving towards an environmental and social change. This research explores this within institutions, specifically high schools.

Approximately ‘123 million young men and women lacked basic literacy skills in 2011…Globally, 61% of illiterate youths were female’ (UNESCO, 2013, p. 17). Despite the importance of combating illiteracy, it is most important to develop environmental awareness (Barraza, 1999), critical skills and actions in high school youths. This change of mindset around the environment can only happen if the factors that influenced those attitudes are understood (Barraza, 2001). Children and youths are not the only hope for change in society in the near future, but also for the present and for this reason, it is imperative to keep them into consideration and find innovative ways and approaches to education. This research proposes CCoD as an educational approach in an Aboriginal boarding high school addressing sustainability, in particular biocultural diversity conservation and regeneration.
Some Indigenous women identify education as a way to free themselves from control and to access material resources directly (Ames, 2013). However, in traditional education, teachers have low educational expectations for rural girls and use old-fashioned and ineffective pedagogies. Physical punishment was commonly used, as well as gendered practices that reinforced traditional female roles (Ames, 2013). This type of school experience pushed girls out of school. Indeed, some girls who dropped out found more satisfaction in participating in household activities, learning useful things to become valued women in their own culture and contributing to the family economy (Ames, 2013).

According to a study by the United Nations (2009), Indigenous students frequently find that state education tends to promote individualism and a competitive atmosphere, rather than communal ways of life and cooperation. In their communities what is promoted is: collective responsibility, individual integrity, respect, reciprocity, harmony with nature, genuine relationships that lie in the heart of community life and community development (Tuhiwai Smith, 2012). At school, most of the times, they are not taught relevant survival and work skills suitable for Indigenous development, and they often return to their communities with a formal education that is irrelevant or unsuitable for their needs.

Non-traditional education is another way of empowerment, self-determination and cultural integrity in innovative practices towards sustainable development in their near future (Keddie, 2011). Scholars assert that higher levels of participation in decision-making will increase youth self-esteem, empathy and responsibility, as well as community participation (Genuis, Willows, Nation, & Jardine, 2015; Train, 2001). This research intends to link these advantages of non-traditional education with the benefits and opportunities that IEK brings, providing a type of participation which embraces relevant
life-skills, such as decision making, critical and reflective thinking, lending privilege and empowerment to IYW.

Australia has a population of approximately 24,899 million people (ABS, 2018), and around 3 per cent of the total population is Indigenous. In 2018 there were 221,982 students enrolled in Australian schools identifying as Aboriginal and Torres Strait Islander. Aboriginal and Torres Strait Islander students made up 5.7% of all students, with the majority enrolled in government schools (83.9%). Although the years 5–17 school-age are compulsory (ABS, 2012), absenteeism and low completion rates have long been recognised as a serious problem throughout Australia (Herbert, McInerney, Fasoli, Stephenson, & Ford, 2014; Purdie & Buckley, 2010). The gap widens steadily from the commencement of secondary age (12-17 years old). For example, non-traditional education programmes in Australia where communities are entrusted to do the best for their youth and empower them, are gaining strength due to their effectiveness, (FAST, 1988; Keddie, 2011; Mechielsen et al., 2014; Minister Council for Education Early Childhood Development and Youth Affairs (MCEECDYA), 2010).

Despite some evidence of successful traditional education programmes outcomes, nationally and internationally, or global education standards, little consideration has been given to the application in remote Indigenous communities for IYW (Flouris, Crane, & Lindeman, 2016; Lopes, Flouris, & Lindeman, 2013). There is a need to test new pedagogical and didactic practices, complementing and supporting formal education (Enache, 2010). ‘Environmental education programmes aimed at particular sectors of society should be promoted in formal and informal settings’ (Barraza & Pineda, 2003, p. 8). Currently, there are indications that Indigenous youth programmes have a positive
impact on health, social and emotional well-being (Zubrick et al., 2005), that they encourage cultural regeneration, foster self-esteem, enhance confidence and develop teamwork, social interaction and skills (Flouris et al., 2016). This research is not intending to empower young people, but to generate an evidence based for a methodology of collaborating with IYW that will hopefully lead to empowerment and self-determination.

Indigenous Methodologies, Qualities and Limitations

Indigenous methodologies and knowledge systems have been practicing over thousands of years through generations, and until recently written by academics (Indigenous and non-Indigenous). Indigenous methodologies and partnerships do not have one methodology, process, measure, evaluation, ethics and results or self-reflection to follow. This is because every project is unique (Adams & Faulkhead, 2012). Each community is different and has different problems, challenges and opportunities, as well as social, cultural, political, economic, professional, religious, class, gender, sexual orientation, racial, ethnic, familiar and geographical dimensions and background. Consequently, every investigation or project has different aims to reach and, at the same time, different complexities to overcome. This study proposes a new methodology, CCoD, studied through a case study methodology with diverse characteristics suitable for the research.

Indigenous methodologies originated from the critique that followed the advent of scientific colonisation, which refers to the ‘imposition of the colonisers’ ways of knowing, and the control of all knowledge produced in the colonies (Chilisa, 2011, p. 9). Colonial legacies continue to play part in the globalisation of knowledge, leading to the loss of cultural diversity. A critique of this way of research and knowledge development shows
the need to develop new approaches that are more suitable when collaborating with Indigenous peoples. Indigenous research methodologies, such as decolonizing methodologies (Chilisa, 2011; Denzin et al., 2008; Tuhiwai Smith, 2012), are some of the practices that were developed by Indigenous and non-Indigenous scholars while looking for ethical and respectful ways of approaches between Indigenous peoples and academia. Indigenist research methodologies are founded on a commitment to moral praxis, self-determination, empowerment, healing, love, community solidarity, respect of the Earth and the elders (Denzin et al., 2008; Tuhiwai Smith, 2012). The approach of this thesis, grounded on decolonizing methodologies, works through empirical ways of knowing and doing between IYW and non-Indigenous peoples, not as a resistance process or giving help to Indigenous peoples, but as a thriving and empowering process of Indigenous worldviews recovery and to show society the importance of traditional knowledge.

Decolonizing methodologies critique how Indigenous peoples around the world have been subjugated by western colonisation methodologies (Tuhiwai Smith, 2012). Therefore, CCoD methodology proposes to incorporate methods, techniques and practices, between Indigenous and non-Indigenous peoples, that break the barriers of communication through a process where both Indigenous peoples and researchers are able to value, reclaim and bring forward Indigenous voices, ontologies, epistemologies, ethics and morals by social action and practices (Denzin et al., 2008). This research critically explores the uses of co-design as a teaching-learning and theoretical-practical process amongst IYW grounded on (Tuhiwai Smith, 2012) notions of an emancipatory discourse of decolonization. As mentioned in the section on Indigeneity, this research explores the opportunities of CCoD possible projects to focus on ethics, voice and empowerment, healing, mobilizing and
transforming. CCoD proposes to incorporate Indigenous methodologies, specifically decolonizing methodologies, in co-design in an Aboriginal boarding high school.

Within a decolonizing discourse, Indigenous research seeks to reveal how a Eurocentric research approach has facilitated the colonization and oppression of Indigenous peoples, and explains how the approach can transform to benefit Indigenous peoples and change western research paradigms (Wilson, 2008). As discussed in Chapter 1, research paradigms are made of beliefs that guide actions amongst researchers. These include the way that researchers view reality (ontology), how researchers think about or know reality (epistemology), the ethics and morals (axiology) and how researchers gain more knowledge about reality (methodology) (Wilson, 2008). Indigenous scholars propose that research should be culturally sensitive when incorporating beliefs, values and customs into the research process (K. Martin, 2003; Rigney, 1999). This research proposes a CCoD methodology developed through the researcher’s ontology and existing literature, supported by an evidence-based approach. The proposed methodology aims at reaching a collaboration with Indigenous peoples that will incorporate their cosmology, worldview, epistemology and ethical beliefs in its approach. This study embraces a cross-cultural vision, integrating different worldviews while privileging Indigenous ones. These practices and beliefs have mutual benefits, thus, breaking the paradigm of Eurocentric researchers. This is also premised on the researcher’s own Indigenous position and situated experience.

To close the gap of understanding and communication, Hoffman (2013, p. 193) developed figures that explained to scholars and researchers which elements are to be taken into consideration when working or collaborating with Aboriginal people in a respectful way.
Evidence in these figures is the interconnectedness between physical, mental, emotional and spiritual elements in the epistemologies of Aboriginal culture, as well as the elements that guide their ways of being, reciprocity, relationship, respect and responsibility (See figure 4).

There are two valuable studies that helped improve the way of seeing communication in CCoD. First, Yunkaporta and Kirby (2011) researched and developed a model on different forms of learning in Aboriginal culture. This model shows the different methods of communication to learn, such as silence, verbal, non-verbal and observational, and links communication and learning (see Figure 5). Second, Wilson (2008) proposes, in his book Research as Ceremony, a holistic use and transmission of information, yarning and storytelling were used in CCoD when building relationships, co-designing the projects and in the intersection and hybridisation of knowledges as a way of decolonizing research.
Yunkaporta and Kirby (2008) identified that this type of learning and communication can not only work with Indigenous peoples, but also in different societies and environments where education and knowledge are transmitted.

Yarning, an Indigenous cultural form of conversation and engagement, is not only aimed at collecting information during the research interviews, but also at establishing a relationship with Indigenous participants prior to gathering their stories through storytelling, also known as narrative. Yarning is a way of enabling participants to relax and allow for in-depth conversations (Bessarab & Ng'andu, 2010). This talk-conversation-yarn can entail the sharing and exchanging of information and knowledge between two or more people, both socially or more formally. Yarning is relational.

Yarning is one of the techniques used in qualitative research to gather data in Indigenous settings (Yunkaporta & Kirby, 2011). Indigenous peoples communicate in a fluent,
holistic and, often, metaphoric manner rather than using a structural and mechanical approach as part of their onto-epistemology (Bessarab & Ng'andu, 2010). Conversation is a major form of communication between people and can take place in different forms (Yunkaporta & Kirby, 2011).

Mutual understanding comes as an essential element in CCoD methodology as it is the capacity to understand the sharing and to exchange ontologies and epistemologies as necessary for cross-cultural engagement (Denzin et al., 2008; Porter et al., 2015), allowing researchers to know and acknowledge each culture, knowledge and participant involved.

Critical Indigenous methodology and decolonizing theory articulate an ontology based on historical realism, aiming to transfer control and power to Indigenous peoples (Chilisa, 2011; Denzin et al., 2008; Tuhiwai Smith, 2012). Among the theories and methodologies developed for decolonizing approaches, the ecowomanism and decolonizing discourse focuses on ethics, voice and empowerment. For this research, the aim is to move IYW’s privilege and empowerment towards agency with integrity and self-determination, not only through dialogical activities but also empirical and tangible projects developing biocultural products and services for their own benefit (social or economic), adding their values, traditions, knowledge and meaning to them. This articulation and intersecting of knowledges create part of the CCoD Conceptual Framework.

Some partnership research has been done in empowering Indigenous women to take responsibility for the education and future of children (Mechielsen et al., 2014; Tuhiwai Smith, 2012) and to overcome long term effects of colonisation and problems, such as sexual abuse, health issues, violence, drugs (Hammill, 2000), sustainable development
(Drolet et al., 2015), climate change (Glazebrook, 2011), encouraging leadership development, sustainability and IEK conservation (Mandaluyong Declaration, 2011). Thus, this research proposes an Indigenous partnership with a co-design approach through action and reflection. This decolonizing approach aims to understand each other’s ontologies and epistemologies or ways of being, knowing and doing (for more information see Chapter 5) while privileging Indigenous research methodologies. This research addresses the apparent gap in the field of co-design with Indigenous peoples, that has been little explored, by valuing Indigenous voices, and in particular IYW, in the development of the CCoD methodology.

**Relationality and Place**

For this research, the notion of Place refers to physicality, time and space. According to Graham (2006, p. 6) place is not ‘objective’ as a scientific description, but denotes a community/locality, and it provides a balance between agency (human and spiritual) and point of origin or Place. Place changes depending on custodial ethic, the Law, to cultural constructs (Graham, 2006), Entities in Country, history of the place, and current existence. All localities/places have their own unique voice (Graham, 2006). Relationality is defined as the inextricable interconnection between Entities on Place (Graham, 2006), people and Country (Holmes & Jampijinpa, 2013). Relationality also refers to the material and immaterial through the agency and interconnectedness of all things (Martin, 2017), together and/or separate. Indigenous peoples believe that the core of life is Country, which means relationality between people and place, a space where all entities are inextricably interconnected. The relationality between method and content of ways of knowing is vital (Martin, 2017) and the relationality between participants and agency within the
methodology process helped to decolonize the research. ‘Indigenous research methods stress the moral nature of land and the need for relationality and interconnectedness with all Entities (life forces), this with ethical quality’ (Graham, 2006, p. 3).

Place is defined as not just physical Country but a time in place and space (Graham, 2006) embracing the human and the spiritual elements. Place is multiple, layered and flexible. As identified in Chapter 1, Graham (2006, p. 7) defines Place as ‘a physical point in landscape, but also a point in time, an event, an imagining or even a landscape itself’. CCoD proposes that Place should underpin the biocultural projects and design. CCoD is premised on Country and Place, which means it is centred on the relationality of all Entities that co-exist in a certain Place at certain moment in time. CCoD proposes the relationality between Country, Place, humans, nature, design, schooling and the material and the immaterial.

**Co-Design Approach, Scopes and Limitations**

In this investigation, co-design acts as the field through which to develop a new methodology and knowledge, and to explore the research. Co-designing biocultural projects (products and services) can privilege and empower IYW, fostering biocultural and IEK conservation and regeneration in collaboration with researchers.

In the past 50 years, the design field has been gaining strength professionally and thirty years ago the practice of design started changing and increasing in research, going beyond the creation of things and expanding to design experience, services and processes (Lee, 2007). Involving users in the process of creation is becoming an essential part in design
research, happening through participatory design (Lee, 2007), co-design and research in design (Sanders & Chan, 2007). Some kinds of design can be seen as a top-down project-activity, as the designer imposes itself or seeks to help people (Brown, 2008). Later, co-design emerged in Scandinavia as a distinct set of projects and research practices, design strategy and instrument of system thinking. This began in the area of computer systems, with the aim of improving the quality of working life (Schuler & Namioka, 1993). Other forms of design thinking have been in existence for a very long time, especially in Indigenous cultures but only until recently discussed in academic literature. Uncle Charles Moran, Uncle Greg Harrington, and Sheehan (2018, p. 76) examine ‘On Country Design’ while discussing ‘Respectful Design’ which it ‘is founded on the understanding that design is ancestral and alive in Country’ they argue that ‘design is simply action in relation and that everything on earth and in the universe is this a designer’. ‘Respectful Design seeks to identify the knowledgeable practices written into Country, engaging with learning environments and reactivating the cultures of repair.

The main difference between participatory design and co-design is that participatory design only involves a relationship between co-designers and practitioners, designers observe or ask questions to users in order to develop something, while co-design develops a relationship between them. In co-design all stakeholders (designers, researchers, users and community) develop projects (products and services), teach and learn together, thus, promoting empowerment in all stakeholders. ‘Co-design refers to the conception or creation of artefacts drawing on a shared vision, social learning and mutual understanding of the stakeholders, taking into account… different perspectives and expectations’ (David, Sabiescu, & Cantoni, 2013, p. 6). CCoD suggests that the relationships between participants are important because all people can bring knowledge to the project, everyone
can be creative as all are experts in something depending on their experiences. Through a co-design approach, Indigenous methodologies can become a collective dialogue as well as practices and actions aiming at the recovery of Indigenous peoples’ positionality and recognition in society. Hence, privileging and empowering them as decision makers and favouring their knowledge within design solutions reflecting Indigenous ways of knowing, being and doing.

According to Lee (2008, p. 4) ‘the ideology of ‘Co-design’ is based on the idea that all people have different opinions and should collaborate in any design process… is becoming an everyday activity rather than a professional study’. Furthermore, ‘In participatory design, empowerment is generated mainly in the users, in collaborative design, practice would also empower the designers’ (Garduño García, 2017, p. 34). In other words co-design is founded on the concepts of design for people and design with the community, or better said: design in community, which involves users as co-creators in the whole span of the design process (Steen, Manschot, & De Koning, 2011). CCoD proposes to position Indigenous participants as co-creators over the CCoD process.

**Processes and Co-Design Workshops**

In co-design, there are several methodologies, processes, tools, participatory methods, practices and inspirations present (Schuler & Namioka, 1993). One of the sources of inspiration to generate benefits, outcomes and design concepts can be design workshops, which is the method chosen to facilitate the Indigenous partnership in this research. Binder, Brandt, and Gregory (2008) point out that there can be different kinds of workshops and they vary widely in composition, duration, scale, purposes related to design phases and
processes, and in designers’ intentions and relations towards participation and with participants.

Every co-design workshop is designed for different purposes, activities and goals, it can be for communities or companies, or it can be around designing products or services for customers or society. Each co-design workshop has some limitations in its use when setting the requirements. The Biocultural Workshop builds upon the ‘Co-design Workshop for Environmental Conservation’ (Ibinarriaga, 2014) (see Figure 6), developed by the researcher as part of her Master’s research. This previous work acted as a basis to develop the Biocultural Workshop and crafting a method for CCoD methodology. The Co-design Workshop for Environmental Conservation, developed in 2014, was used as an innovative work tool for environmental conservation in collaboration with Indigenous communities. It facilitated an Indigenous partnership, with the aim of enhancing the creative skills and developing products and services with Indigenous communities, along with increasing potential for innovative ways of solving problems and identifying opportunities within their communities. The limitation of the co-design workshop (Ibinarriaga, 2014) for this research is that it had focus on solving problems rather than embracing opportunities for bioculturalism. The proposed Biocultural Workshop focuses on this reconfiguring as opportunity driven rather than problem solving.
Figure 6. Co-design workshop for environmental conservation (Ibinarriaga, 2014)

Biocultural projects are linked to negotiations, collaboration and work the researcher has carried out with Indigenous communities in Mexico in the past years, which justifies these topics, services and products. The products and services should be related to Indigenous peoples' interests, passions, necessities, opportunities and desires, for personal and/or professional purposes. The scope of biocultural projects is wide, but always has Indigenous knowledge and biocultural enhancement as its aim. For example, in a past workshop with Indigenous peoples, Ibinarriaga (2014), the researcher, collaborated with an Indigenous community in Mexico and developed tools for capturing rain water, building orchards, getting rid of puddles, as they are mosquito breeding sites. Additionally,
coconut pills for cooking as these were topics of interests for Indigenous people in that specific community. The projects might change depending on the context.

The first step of the Co-design Workshop for Environmental Conservation concerns the diagnosis and opportunity areas. In this step, the researcher finds the community and the stakeholders to participate in the workshop, then the process begins with the individual diagnosis of the community. Each participant individually discovers the opportunities, necessities, challenges and problems, faced through self-reflection within Place.

The second step is co-discovering, which consists of a long collective brainstorming, followed by everybody sharing their ideas. This step helps to develop a mutual understanding and openness of mind.

The generation of ideas is the third step, called co-designing. Organised in teams, the stakeholders develop ideas of products and services for the community based on the community desires, opportunities and necessities. This step is iterative and a living experiment, so if any element turns out to be unsuitable, it can always be modified, leading to re-designing and creating a new product or service.

The fourth step is co-developing, which involves the creation of a product and/or service called a prototype. The 2nd, 3rd and 4th steps should be iterative until each group achieves the best outcome, prototype and goals for that specific group. The last activity includes an exhibition, each group presents their own process, ideas and prototypes of products and services or outcomes, here is where they can have feedback to redesign and enhance the products or services further (Ibinarriaga, 2014).
For the success of the ‘Co-design Workshop for Environmental Conservation’ an integrative learning environment is required, which is only achievable by having students from a variety of levels (undergraduate and graduate), as well as from a variety of backgrounds, interests and skills. In other words, integrative learning fosters mutual learning between all stakeholders.

**Conceptualising biocultural projects**

There is no definition of biocultural products and services, nor biocultural projects, in existing literature. The closest definition, proposed by Davidson-Hunt et al. (2012, p. 39), states that biocultural design ‘is an intentional, collective and collaborative process by which individuals with a diversity of knowledge and skill sets engage in a creative process of designing products and/or services’. Biocultural projects are conceptualised as a key component of CCoD methodology through the case study of this research. Designing biocultural projects refers to designing products and services that are related to Indigenous heritage and/or biological conservation and regeneration, privileging environmental and cultural purposes. The use of these type of products and services may relate to any of these environmental purposes, such as rainwater capture, recycle, reuse, compost, agriculture, customs, doing sustainable connections with companies, cultural and environmental tourism, improving aspect in people’s communities, harness an opportunity or tackle a concern. Biocultural projects can also be related to nature (material and resources management), arts (painting, music, handicrafts, design), day by day activities or usage (clothes, tools, natural medicine, books, food), diffusion of Indigenous knowledges
underpinning recognition of Indigenous wisdom and IEK in the wider society such as commercial purposes, museums, exhibitions, festivals.

Biocultural design refers to biocultural diversity and heritage with a design approach to Innovation (Davidson-Hunt et al., 2012). Biocultural design ‘seeks to open a conversation about how endogenous innovation could support sustainable development in rural Indigenous and local communities’ (Davidson-Hunt et al., 2012, p. 33). Davidson-Hunt et al. (2012) propose biocultural design as one of the tools needed to develop products and services that some communities may find helpful in mobilizing biocultural heritage and address contemporary needs and challenges, as an adaptive potential of biocultural heritage.

Although, ‘There is no widely accepted and conceptually sound definition of product design’ (Homburg, Schwemmle, & Kuehnl, 2015, p. 2) and for the purpose of this research, product design is described as a highly empirical practice used to develop different kinds of products, such as objects, furniture, clothes, among other physical articles, that the community can use within their everyday life. Product design refers to aesthetic (appearance and beauty), functional, symbolic (the perceived message a product communicates), shape and ergonomic dimensions (comfortable to use) (Homburg et al., 2015).

The concept of service design started to receive attention with the first service design conference, *Emergence 2006*, held by Carnegie Mellon University’s School of Design (Sanders & Stappers, 2008). Service design can be seen as a practice to support the development of new concepts (Manzini, 2008). In many service design projects, co-design
is seen as critical to success because of its transformative approach that allows people to communicate and cooperate across disciplines and between organisations (Steen et al., 2011). Steen and fellows propose to group the benefits of service design into four categories: 1) improvement of the creative process, for example the generation of a methodology and the Biocultural Workshop in this research. 2) improvement of the service, to make it run more effectively or efficiently 3) improvement of the project management. 4) improvement of longer-term effects, for example on the market or on society (Steen et al., 2011). Burns et al. (2006) discussed transformation design as a way not only to re-design a service, but also to organise and change processes and to promote creativity, innovation and service experience and through this approach people involved can engage in continuous learning and innovation process. Thus, this research will use co-design biocultural products and services to facilitate IYW empowerment through methods and processes applied to co-design and co-develop biocultural projects in a collaboration between IYW from high school and the researcher, privileging IYW knowledge towards cultural identity pride and IEK conservation and regeneration.

**Roles of Designers**

As design has been evolving, so have designers’ roles. Designers’ roles have changed from simply designing products and services to being facilitators, developers and generators who manage creative processes while creating enthusiasm, ownership and commitment to successful results, and achieving innovation (Lee, 2008). According to Lee, these three roles can be explained in the following manner: *designers as facilitators*, that is, designing with people to transfer design knowledge, mutual understanding and better ways of communication in order to emancipate people towards an improvement of
their lives and practices. *Designers as developers*, which means working with the community to transform design processes for participation. And *designers as generators*, which means collaborating with professionals and non-professionals to explore different ways of design thinking linked to different implications or, for this research, developing new knowledge together. All of these are considered reflective actions in research (Lee, 2008). Designers should work in a flexible and holistic way, and shift between different roles depending on the situation and people, different backgrounds and contexts (Binder et al., 2008; Lee, 2007, 2008).

Even though there are many areas that can be researched through co-design, it has been slow to thrive in social approaches (Halskov & Hansen, 2015). It is difficult for many people to believe that they are creative and innovative and to behave accordingly. Collaborative thinking is antithetical to consumerism, in which personal happiness is equated to purchasing and consuming material goods. Social co-design has been seen as an academic endeavour, with little or no relevance for the competitive marketplace and technologies and future human experiences are more important in mainstream societies (Sanders & Stappers, 2008). This is because ‘Design has mainly been practiced with the goal of making profits grow and in many cases, market success is mentioned as a necessary quality of a well-designed product. Designing for societal change is therefore not as relevant, not as widely practiced and a choice rarely available for professionals and recently graduated designers’ (Garduño García, 2015, p. 11).

Although the researcher, the community, the designer and the user types of knowledge are needed in co-design (Steen et al., 2011), leadership and guidance are also essential to achieve successful outcomes. People can enhance their innovative skills when they are
given virtuous guidance, tools and circumstances (Westerlund, Lindqvist, Mackay, & Sundblad, 2003). Thus, the facilitator (designer/researcher) plays a key role in CCoD methodology in offering assistance and guidance throughout the activities, supporting participants in the discovery of the knowledge they already possess and their own potential in order to privilege their knowledge and experience and empower them towards self-determination. The role of the researcher/designer proposed in CCoD to facilitate entails the creation of an environment in which people co-learn, co-discover, co-design, co-create, co-experiment, co-explore and co-develop. In successful co-design projects, the researcher/designer should be seen as a peer, developer, facilitator and generator, not as an imposer of processes and knowledge (Lee, 2008; Sanders & Stappers, 2008). In the field of co-design, there is little research around working with Indigenous peoples, and nothing about working in collaboration between IYW and scholars towards biocultural diversity and IEK conservation and regeneration. This research endeavours to cover this gap which recognises the importance of Indigenous knowledge, practices and worldviews.

**Co-design with Indigenous people**

A research that contemplates the inclusion of Indigenous peoples and a partnership into the development of environmental projects and co-design practices are less common. Most of this field of research has only evolved in the last decade. Such as critical design ethnography (Barab, Thomas, Dodge, Squire, & Newell, 2004), organization and communication in immersive international field programs with artisan communities (Lawson, 2010), ecology of learning within a school sustainability co-design project (Wake & Eames, 2013). Other include, co-design methods for environmental conservation with Indigenous peoples (Ibinarriaga, 2014), co-designing an eco-hostel with a Mayan
community (Garduño García, 2015), alternative approaches to co-design with insights from Indigenous/academic research collaborations (Parsons et al., 2016), recognition of appropriate representation of Indigenous knowledge in professional design practices (Kelly & Kennedy, 2016) and *International Indigenous Design Charter*, (Kennedy, Kelly, Greenaay, & Martin, 2018). Kennedy et al. (2018) provide ten useful steps for best practices protocols to share Indigenous knowledges in professional design practices. Garduño García (2015) provided evidence that through the co-design process three groups of people - designers, participant and users – can learn from each other in a way where all parties seem to feel more daring and extend their individual and collective capacities mutually. There is, however, a gap in the existing research in co-design with IYW, which this research addresses.

Steen (2013) argues that in co-design there are five virtues, these, connected to practice in design context, to follow in order to ensure the success of co-design projects and mitigate the disadvantages. These virtues are cooperation, curiosity, creativity, empowerment and reflexivity. Some match with the Indigenous partnership features discussed previously. Workshops and cooperative prototyping are key approaches to promoting cooperative creativity in co-design. Empowerment helps people sharing power and knowledge, and to enable other people to flourish with willingness and share power with others, which is one of the critiques presented through Indigenous methodologies. Thus, exploring through co-design these power shifts through action and practices towards the emancipation of Indigenous peoples, the CCoD Conceptual Framework promotes a non-hierarchal relationality in co-design.
Moreover, reflexivity helps people to perceive and to modify their own thoughts, feelings and actions. These virtue ethics focus on the cultivation of values and emotions rather than norms and ratios, to enable people to flourish, to promote people’s well-being and fair society (Steen, 2013). By fostering these five virtues, Steen (2013) writes, people can enhance or learn to think, feel and act virtuously by trying-out virtuous behaviour or by looking at people who behave virtuously. These two latter virtues, empowerment and reflectivity, are some of the main aims in this thesis, and they can be encouraged by co-design. In comparison, Indigenous research methods guide the researcher towards values or from the design perspective called virtues such as interconnectedness, respectfulness, collective responsibility and community development, which are embedded in Indigenous peoples’ worldviews. These virtues or values assist in the recovery from colonialism. Smith argues that they are essential to the research agenda of Indigenous peoples (Tuhiwai Smith, 2012). These virtues overlap in some way, as both empower people and encourage self and collaborative development with willingness, one theoretically and the other one empirically.

A key advantage of co-design with community, according to Westerlund et al. (2003), is obtaining real-life experience, understanding knowledges and recognising opportunities, needs and desires of a community. This research argues that the co-design field has been performing as a new form of support of social practices among modern/urban society, but not much work has been bone with Indigenous peoples (Garduño García, 2015). Thus, this research intends to fill this gap in the co-design field while incorporating an Indigenous approach. The CCoD methodology developed throughout this research not only addresses the little study done with Indigenous peoples within the co-design field, but it also promotes a new practice in co-designing and co-developing biocultural projects,
such as products and services, privileging Indigenous peoples’ cosmology and enhancing creativity in their ways of doing without losing their IEK, but, instead, promoting its conservation and recovery.

The importance of applying the process to co-designing products and services is that it can be a virtuous practice to empower people to develop cognitive, creative, empirical, practical and reflective skills through the process of being innovative and collaborative with the feeling of accomplishment (Brown, 2008; Steen et al., 2011). Dovetailing these Indigenous and co-design methodologies is essential not only in a theoretical or practical approach, but also to achieving a balance between them that attends to academic requirements with practical outcomes.

**Critical design**

While co-design describes the way people work together, critical design practice describes the nature of the challenge, opportunity or problem that is being attended to. DiSalvo (2009) defines critical design practice as the ability to increase societal awareness and enhancing motivation, enabling action through the object. For this purpose, CCoD focuses on IYW in high school in Australia, working with academics towards the empowerment and development of design skills and on reflective thinking towards biocultural and IEK conservation and regeneration. This is done through holding a biocultural workshop as a facilitator of practices and processes, reaching biocultural projects that lead to decision making, problem-solving, project completion, self-esteem, self-confidence and empowerment.
Critical thinking and design are useful tools to develop creative and critical skills for youth. Critical design is one of the most effective methodologies to combine these tools (Sanders & Chan, 2007). Critical design evaluates the current situation and relies on design experts to create new settings that provoke the understanding of current realities and values in society (Malpass, 2016). Critical design makes people think and reflect. ‘Critical design practice, therefore, facilitates a way of knowing, exploring, projecting and understanding the relationship between users, objects and the systems that they exist in’ (Malpass, 2016, p. 478). Therefore, critical design is being used for changing designers’ minds, according to Malpass (2016).

There are different methods to facilitate critical design which include storytelling and constructing narrative are methods in critical design practices (Malpass, 2016). Similarly they work as key elements in Aboriginal peoples’ ways of knowing, learning and passing on knowledge (Yunkaporta & Kirby, 2011). They are seen as part of the design process in order to encourage reflection on meaning in the work and this critical design practice allows for exploration, reflection and engagement (Malpass, 2016). Thus, CCoD incorporates the spirit of critical design in order to demonstrate the process of co-design products and services for IYW through a stimulated recall with a co-reflective yarning focus group activity.

To conclude, co-design can be valuable as a field to encourage people’s active involvement in addressing personal or community opportunities and challenges, in addition to empowering them to enhance their skills (Lawson, 2010). This, in turn, has the potential to build people’s confidence, support networks and resilience, then empowering the community to preserve and respect the culture, language and tradition (Lawson, 2010).
This research argues that co-design and critical co-design can handle activities and collaborative practices but not the complexities of Indigenous and diverse worldviews that exist in an Indigenous partnership, which it is the current limitation of co-design. CCoD methodology proposes to explore these limitations through the empowerment and privileging of IYW in the regeneration and conservation of their biocultural diversity and IEK, through enhancing their skills, creating new knowledge and developing biocultural practices and projects.

Even though literature about co-design projects with Indigenous youth is still relatively uncommon, Wake (2013) argues that co-design with children and youth is not just a worthy ideal, but an essential goal. Children must be influenced positively about creating environmentally sustainable places and spaces to environmental change. Over forty years ago, Papanek and Fuller (1972) wrote about environmental impacts and solutions of design. They believed that although designers are implicated in all pollution, or at least partially because everything that is designed and produced causes an environmental impact, design can and must become a way in which young people can participate in changing society and decision making. In this research, co-design of biocultural products and services with IYW may be seen as a medium for exploring possible social transformations towards a sustainable world.

**Challenging design assumptions**

In this section, the researcher challenges design assumptions that need to be explored before proceeding with this research. These assumptions are, first, a critical approach in co-design while collaborating with Indigenous peoples and the acknowledgment of
relationality in Place, as a practice to recognise the advantages and opportunities of Indigenous peoples in wider society towards environmental conservation through their ancestral knowledge. Second, the challenge and the need to change the economic and technological paradigm of design can be paramount to the importance of the conception of co-design as a social practice with tangible and intangible outcomes. Third, the present research critiques and discusses on how design can overcome these limitations through co-design with Indigenous peoples as a social design practice which is a biocultural driven activity with wide benefits for the civilization in general. Fourth, the role of designers and participants in design.

Consequently, defining the roles of participants, IYW and researcher/designer as co-researchers and co-developers towards sustainability and biocultural diversity, this research challenges the power relations with its limitations. The researcher/designer has other roles within the research, for instance dealing with complex or wicked problems, the capacity to facilitate creative processes, and the ability to imagine new futures (Garduño García, 2017). Within the fieldwork, the role of the researcher/designer was encouraged and empowered as co-designer and co-developer while being one of the participants in the workshop.

A critical aspect of this research argument is that design education should be greatly transformed. Design should be taught not only as problem crafting, problem-solving (Bernie, 2014; Garduño García, 2017), but also as harnessing opportunities within the relationality of people and Place, as well as desire crafting towards sustainability, with a social positive approach in environmental development perspectives. CCoD is suggested to be a bottom-up methodology, study and practice focusing on harnessing complex
opportunities in society and nature that are relational, rather than focusing only on the problem-solving side of complex society as extrinsic of partial solving. CCoD is founded on this bottom up transformation. As Thackara (2006, p. 6) claims, ‘To do things differently, we need to perceive things differently. In discussing where we want to be, breakthrough ideas often come when people look at the world through a fresh lens.’ One of the most important design challenges Thackara (2006) poses, is to make the processes and systems of design in everyday life intelligible and knowable. Supporting this, Garduño García (2017) states, design’s greatest contribution to humanity might originate from the designer’s ability to imagine a radically different and desirable future. This research proposes the potential transformation of the role of designers who focus on relationality between people and Place, to the advantage of Indigenous peoples and their IEK. Such designers could play a key role in society to break barriers in communication between Indigenous and non-Indigenous people through the integration of ontologies, epistemologies and visions to achieve a thriving sustainable future.

**Critical Approach**

The critical approach for this thesis is based on the resistance against different forms of power towards the emancipation (Allen, 2015) of the oppressed (Freire, 1970) as a way of freedom, justice or liberation (Freire, 1978), where freedom is understood in terms of practices of self-transformation (Horkheimer, 1982). While the notion of critique in environment, Indigeneity, education and design was introduced above, this section provides a critical theory approach that can be used to justify CCoD in the context of this research. A critical theory approach has been used to explore power relationships in
studies of race, gender, ecowomanism, decolonization of research and traditional education, which are addressed or considered in this thesis. In the context of this research a critical approach might provide a way of emancipation and self-determination of IYW through elements of critical theory, therefore critical inquiry aims to be a tool, in this research, for social and environmental change while integrating Indigenous knowledge systems (Odora Hoppers, 2002).

The critique of this investigation regards how IYW can thrive in recovering and conserving their IEK and biocultural diversity through CCoD, enhancing empowerment and self-determination, and including the resistance against different forms of power relations and structures among society. For this research, power relations are challenged and defined in ways that promote the transformation of existing educational and social inequalities in mainstream practices, towards democratic strategies and interventions that can shift power relations and alter meaning (Darder et al., 2009). Previous research has explored participants’ empowerment and emancipation as a way of freedom, where freedom is understood in terms of practices of self-transformation towards decision-making (Freire, 1978).

In the context of a CCoD project, critical theory cannot be divorced from empowerment, for it becomes a matter of solving specific issues that are perceived as being related to individual limitations (Ertner et al., 2010; Freire, 1978; Steen, 2013). Empowerment is also associated with the word emancipated (Ertner et al., 2010; Freire, 1978), through empowerment people can challenge the power relations and structures that are embedded in society and those institutions that perpetuate the marginalisation of groups (Ertner et al., 2010). This research explores the potential of empowerment within IYW through a
methodology that combines these theoretical constructs/methods/practices providing IYW with the competencies needed towards increasing motivation and improving decision making. Its purpose is to change the historical context, where Indigenous peoples have an important role in society towards resilience. In CCoD, empowerment is proposed as a concept to support and harness virtues, values, knowledge and advantages of Indigenous peoples, specifically IYW.

This research looks at breaking the paradigm of Indigenous peoples as the subject of research to take advantage of their knowledge (Odora Hoppers, 2002). CCoD proposes that Indigenous peoples harness their knowledge and skills, connecting with broader society for example with their medicinal plants, products, arts, crafts, sciences, literature, medicines, music, heritage, architecture, agriculture, aquaculture etc. By doing so, Indigenous peoples can benefit using their culture and knowledge for broader society while conserving their IEK and practices. Indigenous peoples have a right to their economic, social and cultural development, as well as the right to dignity and protection from exploitation or degradation, as stated in the Universal Declaration of Human Rights (UDHR). Indigenous research methodologies are a form of critical theory that uniquely positions and upholds these rights and protection to give Indigenous peoples sovereignty and to privilege their worldviews. CCoD draws on Indigenous and co-design methodologies, protecting the rights of the participants in an approach which supports social, biological and cultural development.
Dovetailing Indigenous and Co-design Methodologies

As mentioned above, this research critiques co-design as a mere mean of making profits grow, with little emphasis on social and environmental development. CCoD, instead, supports cross-cultural collaboration through its practices, it tackles the gap of co-design with IYW, balancing theory and practice through academia and through criticising not only the role of the designer, but also the participants. This investigation also supports Indigenous methodologies in incorporating the critical discourse of decolonizing research methodologies (Tuhiwai Smith, 2012) and discoursing about race, gender, class and the valuable roles of Indigenous women. It critiques the current lack of a practical approach with IYW through a positive and empowering discourse, through setting a stage for recovery and regeneration, according to Tuhiwai Smith (2012). It finally challenges power relations empirically through a new methodology to be used between Indigenous peoples and researchers/designers. Indigenous methodologies can facilitate the understanding of the ontology and epistemology of Indigenous peoples (Denzin et al., 2008) along with their diverse backgrounds within their point of view, for many of these methodologies have been created by Indigenous scholars, and some implemented among the communities and institutions (Tuhiwai Smith, 2012).

An underlying premise of this study is how theory and practice should be inextricably interconnected, linked by the diverse understandings of the world and actions in daily life (Darder et al., 2009). For this research, practice is defined as the ways of knowing and doing: ‘All human activity is understood as emerging from an on-going interaction of reflection, dialogue and action namely praxis- and as praxis, all human activity requires a theory to illuminate it and provide a better understanding of the world’ (Darder et al., 2009,
Therefore, this research proposes, on one hand, that co-design gives a focus into critical and decolonizing approaches as well as theory development, while on the other hand, it proposes that Indigenous methodologies incorporate a practical approach through co-design practices while collaborating with Indigenous and non-Indigenous people. Freire (1970) argues that in praxis, from within the context of such a dichotomy, both theory and practice lose their power to transform reality. Isolated from practice, the theory becomes an abstraction, or ‘simple verbalism’. Separated from theory, practice becomes ungrounded activity, or ‘blind activism’. This research is grounded in balancing theory and practice for a better understanding of the project reality, foundations and outcomes. This balance between theory (Indigenous methodologies) and practice (Co-design practices) is the foundation of the CCoD Conceptual Framework.

**Critical Thinking- Education for Critical Consciousness**

Critical thinking can be defined as ‘the ability to apply higher cognitive skills (e.g. analysis, synthesis, self-reflection, perspective-taking) and/or the disposition to be deliberate about thinking (being open-minded or intellectually honest) that leads to action that is logical and appropriate’ (Huang, Lindell, Jaffe, & Sullivan, 2016, p. 237).

Freire (1970) claims that society without education is a society without emancipation and freedom. Being an educated person gives people consciousness, the ability to engage in dialogue and participate in social decision making, as well as the capacity to have political and social responsibility for the future, becoming a dynamic society. To make people agents of their own recuperation is not to help or assist them, because that does not create responsibility, nor opportunity, for decision making, but instead it can empower them by
enabling responsibility for their futures and becoming active agents of change (Freire, 1973, 1978). Critical thinking is one of the key elements being explored in this research, how to achieve reflective thinking and critical consciousness through practical approaches within the co-design field. Freire (1978) believes that with this kind of critical thinking educational change, people can discover their capacities and aptitudes to create and recreate, they can understand that culture is all human creation (handicrafts, poetry, science, among others).

According to Barraza and Robottom (2008) to achieve a sustainable society teaching and learning methods that promote a critical and reflective perspective in their learners are required. A more dynamic and interactive learning approach could be promoted to reach this aim, which this research is intending to do through CCoD within the design field of study. The process of partnership and collaborative actions will support the individual’s and community’s capacity to address concerns within Indigenous approaches, as well as develop new critical skills, making it an important step toward critical consciousness (Freire, 1970; Genuis et al., 2015).

According to Sandoval et al. (2016), self and collective consciousness is a skill to develop for Ancestral Knowledge Systems where sharing practices, knowledge, and listening to stories are methods to empower this conservation and revitalisation of IEK. Critical thinking and consciousness are fundamental skills in Indigenous partnership and co-design reflection to lend empowerment and better retention of knowledge, awareness, enhancement of skills and decision-making encouragement in youths. The CCoD methodology proposes that critical thinking skills should be encouraged by different strategies, such as reflection and questioning in self- or co-reflection activities. This
collaboration towards knowledge co-generation can happen through partnerships between Indigenous youth and researchers, through building a knowledge that is credible for both the community and the academia (Hill, Cullen-Unsworth, Talbot, & McIntyre-Tamwoy, 2011). Young people are active contributing members of society, they are not passive receivers of information (Quijada Cerecer, Cahill, & Bradley, 2013).

**Summary**

In this summary, I provide an outline in support of the formulation of the research questions. I synthesise a set of research questions based on the literature review and initiate an inquiry around the potential of CCoD methodology practices. This research intends to integrate four fields to provide a different perspective and solution to the gap in the co-design field, all by incorporating Indigenous peoples’ understanding and their ontological and epistemological perspectives. The first of the four fields touched on is an environmental approach that includes a biocultural diversity conservation project, with a focus on conservation and regeneration towards social well-being. The second field explores Indigenous peoples’ ontological and epistemological perspectives that could lead to privileging Indigenous young women’s ways of being, knowing, doing and becoming within an educational environment. The third field is co-design, which facilitates dialogical and practical spaces to collaborate and communicate, co-creating physical biocultural projects and the development and enhancement of skills. The fourth field identifies how critical theory can challenge traditional education through decolonizing education and research, addressing unequal power relations and enhancing cultural identity. In weaving together Indigenous and co-design methodologies, this research supports reflective and critical thinking to
empower Indigenous students. This complex theory building lays the basis for investigating CCoD. In the study and analysis of these fields, the researcher developed the following key research question: What are the elements, epistemologies, ontologies and discourse of an effective Critical Co-Design methodology that empowers Indigenous Young Women? This question is answered in Chapter 5.

The sub-research questions mentioned below emerged after critically understanding the conceptualisation of CCoD. As CCoD dovetails the two different practices of co-design and Indigenous methodologies, specifically decolonizing methodologies, the first sub-research question arose with the importance of understanding similarities, differences and limitations of each methodology, on top of how CCoD might add to Co-design and Indigenous methodologies. The second and third sub-research questions emerged while understanding the materialisation and/or practice of the CCoD methodology: How can CCoD support the design of a biocultural workshop for IYW high school students in a boarding school context? How could mutual learning and enhancement of reflective thinking skills be enacted during the CCoD methodology? These questions help to realise and consider the reaches and limitations of the methodology proposed, which assisted in formulating the next question: What are the tensions and limitations of CCoD? Lastly, after understanding the reaches and limitations of the CCoD, and looking for further research, the last sub-research question arose: How CCoD could be transferrable to other contexts?

The next chapter outlines the case study research as a suitable qualitative methodology for this study. The case study methodology used in this research incorporates elements of
Indigenous methodologies to guide the researcher towards designing the CCoD methodology, which is the new knowledge in this thesis.
CHAPTER THREE. CASE STUDY: THE JOURNEY TO DEVELOP CCoD

The research methodology is a qualitative case study approach, through which it develops, proposes and implements the CCoD methodology. This chapter outlines and examines the qualitative research case study methodology and the methods used to build the theoretical concepts of CCoD based on the empirical evidence from the research, both in Australia and Mexico, which used different stages of data analysis to give credibility, dependability and transferability to the theory and practice. The research then integrates the site data as a way of conceptualising the CCoD Conceptual Framework and providing an evidence base. Here, the research builds and acts as a platform of relationality, framework and positionality. The journey to conceptualise the CCoD methodology is defined through the description of the process and the methods used per site while acknowledging Place (Graham, 2006), which is an essential element for CCoD and the research. This relational journey to conceptualise CCoD methodology and its implementation is the substance of this research. Furthermore, the relationality of Place and identity intersects with methodology.

Qualitative research

This research is based on a qualitative research founded on understanding participants’ experiences, how people interpret their experiences and learning, and how their ontologies and epistemologies are constructed. The analysis strives for depth of understanding and it is ‘richly descriptive’ (Merriam & Tisdell, 2016, p. 17). Most qualitative inquiries address philosophical, critical and interpretative foundations, as in the present thesis. ‘Qualitative
researchers are interested in understanding how people interpret their experiences, how they construct their worlds, and what meaning they attribute to their experiences’ (Merriam & Tisdell, 2016, p. 6). Qualitative research is defined as research that ‘uses words as data ...collected and analysed in all sorts of ways’ (Merriam & Tisdell, 2016, p. 6). This research is not based on quantitative research, as it does not use numbers as measurements. This research is qualitative and critical, as it is founded on transformative and emancipatory education (Freire, 1978) through challenging power relations supported by decolonizing methodologies harnessing Indigenous opportunities and empowering IYW (Tuhiwai Smith, 2012) in an applied co-design approach (Ibinarriaga, 2014).

**Case Study**

This investigation uses a case study with multiple sites within the qualitative approach of the research. The case study is defined as ‘an in-depth description and analysis of a bounded system’ (Merriam & Tisdell, 2016, p. 37) and it is seen as a suitable research strategy for theory building through looking at empirical evidence while studying a complex social phenomena in a real-world setting (Harrison, Birks, Franklin, & Mills, 2017; Yin, 1994). As this research is an empirical inquiry and examines a contemporary phenomenon in its real-life context, the case study approach is suitable (Yin, 1981b). In the case study conducted in this research, participants are treated as active subjects, involved in almost the entire process with the exception of the background and literature review of the research (Blatter & Haverland, 2012). A qualitative methodology case study is flexible, descriptive, explanatory and exploratory (Harrison et al., 2017). In this research flexibility is essential as it is dynamic in its journey and approach to organisations’ and participants’ needs, perspectives and mutual benefits and it is explanatory as it uses
narratives and descriptions to explain the journey of the process and the changes, which is by its nature exploratory. Case study is pragmatic (Merriam, 2009), interpretive (Stake, 1995) and descriptive (Yin, 2013). This makes case study ideal for this research as it has real-life applications and description through narratives of the phenomenon and finally, it is interpretative as the researcher analyses the data to create theoretical constructs of CCoD methodology. The most defining characteristic of a case study research lies in precisely defining the object of study (Merriam & Tisdell, 2016) and the single case study used for this investigation is the CCoD methodology.

Multiple-case design is seen as ‘appropriate when the same phenomenon is thought to exist in a variety of situations. Under these circumstances, each individual case study still must be rigorously conducted, but the collection of several case studies on the same topic is intended to be the basis for replicating or confirming the results’ (Yin, 1981a, p. 101). Even though both case study and multiple-case studies can give credible data that can be used as evidence, this research uses a single-case design, as the CCoD is not replicated in each site, and in this research each site has a different purpose (see section ‘Journey to conceptualise CCoD’ in the current Chapter). Case studies are seen as empirical studies focussing on a single complex phenomenon or outcome (Stake, 1995) and in this case the CCoD methodology. A single case can still facilitate the understanding of the phenomenon under investigation in a deeper manner, placing more emphasis on inductive exploration, discovery and holistic analysis presented in a thick description of the case (Harrison et al., 2017). A single case can enable the creation of more complicated theories than multiple-cases, because analysis of a single-case can enable in-depth theoretical analysis of the many details of the particular case (Blatter & Haverland, 2012; Eisenhardt
& Graebner, 2007) and they are able to take one or more different theoretical frameworks into consideration, as this research project does.

To ensure greater validity and credibility, this case study investigates a single phenomenon, the CCoD methodology, exploring it in two different contexts: Australia and Mexico. In the main context, Australia, the Biocultural Workshop was enacted to generate insights for the CCoD methodology. While the other site, Mexico, helped the case study provide feedback of the transferability and applicability to the CCoD. This research is also based on building theory as an intense reflection and relationality between empirical observations and abstract theoretical concepts (Blatter & Haverland, 2012) (see Figure 7).

![Diagram](image)

Figure 7. Case Study - The research design to conceptualise CCoD as a methodology

There are many reasons for building the theory from the cases (Blatter & Haverland, 2012). The first reason to generate an original theory is to reconcile evidence across data, literature and other investigations, enhancing validity on the constructs and results and the second one is to generate it from direct evidence, so that the constructs are supported by...
evidence. Therefore, the theory is validated from an empirical base of evidence, resulting on the generation of new constructs that are both derived from and supported by evidence.

A diverse set of explanatory factors and cross-cultural comparisons were used to validate and construct the CCoD theory. In this research, the CCoD methodology is proposed as emergent, in the sense that it is developed by analysing patterns of relationships amid constructs within underlying logical arguments. This close adherence to the data keeps researchers ‘honest’ and objective (Eisenhardt & Graebner, 2007, p. 25). ‘A key feature of theory-building case research is the freedom to make adjustments during the data collection process. These adjustments can be the addition of cases to probe particular themes which emerge’ (Eisenhardt, 1989, p. 539). These opportunities to make adjustments are built into the theorisation of the CCoD methodology using a range of theories, empirical evidence and serendipity opportunities throughout the research.

There are several problems in the dominant scientific research. First, no matter how objective researchers claim their methods and themselves to be, they bring their own set of biases (Wilson, 2008). Second, research focuses on negative aspects of Indigenous peoples identified by outsiders, and often try to solve them with outside solutions and this method creates the proliferation of negative stereotypes about Indigenous peoples (Wilson, 2008). On the other hand, this research incorporates the outlooks of people with different worldviews, like co-researchers who bring a different perspective to the research when planning, designing, analysing and giving conclusions. In addition, the present research focuses on positive aspects and opportunities for Indigenous peoples, such as interests, skills, vision, cosmology, practices and sensitivity, even taking into consideration challenges and problems that can emerge. All solutions are made by Indigenous peoples.
in collaboration with academics, first privileging and benefiting Indigenous peoples and, afterwards, academia.

Theory-building researchers typically combine multiple data collection methods (Eisenhardt, 1989). Therefore, this qualitative research combines multiple data gathering methods specifically chosen to develop strong validation of constructs based on theories and practice (triangulation of empirical evidence). It is also typical for case study to use a variety of methods for triangulation purposes and to get a deeper understanding of the phenomenon under investigation. Some methods were chosen from the literature (Yin, 2013), such as observations and notes taken by the researcher during the Biocultural Workshop, or stimulated recalls during reflection activity (Fox-Turnbull, 2009), and interviews (Merriam & Tisdell, 2016) with school leaders and teachers. Some other data collection methods were developed by the researcher and used to comply with the school requirements, including biocultural projects to gain insight into the cultural significance and design approach, and weekly reports of the researcher to the school to provide ‘member checking’ opportunities for the researchers’ observations and lines of inquiry. The data was used to ensure the validation and generation of the emergent theory, the CCoD methodology. The resultant theory can be original, culturally sensitive and relevant, as well as empirically informed giving validity (Eisenhardt, 1989).

There are many benefits in using building theory from case studies, but there are some limitations as well. The researcher’s bias frames the purpose and ontology for the research, which can influence the way the data is collected and analysed. As Yin (1981a, p. 106) states ‘poor case study research is that which assumes only a single perspective, and the use of informants in this review role is one way of minimizing such biases.’. To overcome
this possible drawback, this research proposes to involve divergent perspectives as a strength to avoid bias, and to use cross-checking of data from different sources to ensure accuracy of results and findings.

There are two key advantages to the empirical grounding of the theory. First, the grounding enhances the creative potential of the study, enriches the participants’ insights adding to the richness of the data, and, through their different perspectives, increases the likelihood of capitalising on any new insights. Second, the convergence of observations from multiple participants co-investigators enhances confidence in the outcomes and increases the likelihood of unexpected findings (Eisenhardt, 1989).

The complexity, or challenge, of the case study methods is based on being time-consuming and requiring close scrutiny of data, plus the researcher has to be continually referring to the data and the theory (Glaser & Strauss, 1967). Eisenhardt and Graebner (2007) consider that the best way to address this challenge of ‘better stories vs. better theories’ is to develop a theory in sections, or by distinct propositions, in such a way that each one is supported by empirical evidence (Eisenhardt & Graebner, 2007, p. 29). For better constructs of the CCoD methodology, this research firstly investigates the extensive literature about principles of Indigenous and co-design methodologies, as outlined in the literature review and, secondly, it supports and/or proposes new tenets by complementing them with pragmatic evidence and analysis.

According to Eisenhardt (1989) analysing data is the heart of building theory from case studies. The most difficult part is the least codified part of the process and theories that give little space to analysis discussion. A huge gap often separates data from conclusions,
as there is no standard format for such analysis (Merriam & Tisdell, 2016). Another difficulty in generating insights is the volume of data that can be collected during the fieldwork, researchers can get lost in data analysis if the themes and aims are not well assigned. This research approaches this limitation by formulating the aims and research questions to avoid getting lost in the data gathered. This research uses a constant connection between data and theory so that accumulating evidence from different sources converges on a single, and well-defined, construct of the CCoD methodology.

**Data Collection and Methods**

Data collection is about asking, observing (Merriam & Tisdell, 2016), collaborating, sharing and, sometimes, practising and reflecting (Yin, 2013), and this research includes all of these approaches. The data was collected through different qualitative methods carefully chosen to understand the CCoD methodology and its necessities, and used for further analysis (see Appendix). The iterative cycle consists of moments of investigation, observation, reflection, planning, action, sharing feedback and serendipitous outcomes. Documentation was a key action in this case study research, it is about preserving information and insights while building an evidence base (Crane, 2010).

Table 1 below presents the relationality between the aims of the research and the methods chosen to reach those aims and answer the research questions.
<table>
<thead>
<tr>
<th>AIMS</th>
<th>METHOD</th>
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<tbody>
<tr>
<td>1 Identify how IYW might influence environmental and personal education by enacting skills like cooperation, curiosity and creativity, their cultural identity, mutual learning and reflective thinking through co-designing biocultural projects.</td>
<td>• Observations through the Biocultural Workshop (photos)</td>
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<td></td>
<td>• Fieldwork diary of the researcher</td>
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<td></td>
<td>• Interviews teachers and staff</td>
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<tr>
<td>Participants: IYW as co-producers and as co-designers</td>
<td></td>
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<tr>
<td>2 Recognise potential benefits and engagement amongst IYW during the implementation of the CCoD.</td>
<td>• Stimulated recall as a reflective practice</td>
</tr>
<tr>
<td></td>
<td>• Interview teachers and staff school</td>
</tr>
<tr>
<td>Participants: IYW and teachers as co-producers and as co-designers</td>
<td></td>
</tr>
<tr>
<td>3 Analyse how Indigenous students negotiate the different opportunities and challenges associated with Place-based experiences within the CCoD project.</td>
<td>• Observation over the biocultural workshop (photos)</td>
</tr>
<tr>
<td></td>
<td>• Biocultural projects (photos)</td>
</tr>
<tr>
<td></td>
<td>• Fieldwork diary of the researcher</td>
</tr>
<tr>
<td>Participants: IYW as co-producers and as co-designers</td>
<td></td>
</tr>
</tbody>
</table>
Methods

The different qualitative methods for this study were limited to observations, field notes of the researcher (Merriam & Tisdell, 2016), stimulated recall as a reflection activity (Fox-Turnbull, 2009), weekly reports of the researcher to the school, biocultural projects, and interviews with school leaders and teachers both in Australia and Mexico. The methods used for this research, which were included in the ethics application, are intended to validate the CCoD methodology per se, but they are not part of the CCoD methodology.

Observations

Participant observation (Kawulich, 2005) is a method for gathering data appropriate to study interactions and relationships, processes and cultures through the recording of behaviours, and conversations and experiences. It can assist researchers to understand the relationships between groups and it is exceptional for studying processes, relationships amongst people and events to gain a deeper understanding of social dynamics. ‘The process of participant observation requires the researcher to become involved as a participant in a social setting and make descriptive observations of him/herself, of others, and of the setting’ (Mackellar, 2013, p. 57). The participant observation was recorded through the field notes of the researcher and the reports to the school to inform on the progress of the students.

Participant observation in action is a key data-gathering technique (Barab et al., 2004; Grills, 1998; Merriam & Tisdell, 2016) from three sources: the observation of customs and practices among the school or community, observation during the Biocultural
Workshop, and observation during the reflective activity. These observations were collected over the Biocultural Workshop, focus group with the IYW in Australia and through the interviews with the teachers in both Australia and Mexico. This method was used to understand the contexts of intervention, the interaction of individuals in the context, and their environment. This research uses observation and description of what participants do, how they behave and interact, in order to understand their beliefs, values, motivations, perceptions and perspectives. The observations had the purpose of building relationships with the participants for the development of empathy, trust and confidence both with the IYW and the school.

During the process of the Biocultural Workshop, observation of participants was essential to understand the collaboration between both IYW and the researcher towards mutual learning and understanding of the ways of being, knowing and doing. The observations were recorded in the fieldwork diary of the researcher (see Appendix). An approximate number of 1300 of pictures were taken over the research process.

**Fieldwork diary of the researcher**

Field notes and observations contain space, actors, activities, events, time, purpose, reflections, positive and negative experiences, and shifts (Merriam & Tisdell, 2016). A diary was used to record the researcher’s reflections in each of the fieldwork sessions. These recordings included day by day activities, process, observation of the process, shifts in participants, reflections, progress during the day, positive and negative experiences, and other notes that the researcher thought were relevant for the research and further analysis (see Appendix).
Field notes are an important mean of accomplishing the overlap between data collection and analysis (Eisenhardt, 1989). They are an ongoing stream-of-consciousness commentary about what is happening in the research, involving both observation and analysis (Van Maanen, 2011). These ideas in this research were useful to explore the similarities, comparisons, hunches in relationships, anecdotes and informal observations.

**Reports to the school**

As a requirement of the school, the researcher reported back to the school and the teachers through weekly reports that helped informing the progress and stages of the project, as well as documenting the roll out of CCoD to the school management and teachers. The reports were based on the researcher’s observations, fieldwork notes and pictures of the activities. These reports were written on the same day in which the session was held, to record accuracy and avoid forgetting important data. The teachers and principal gave feedback on these reports. This feedback and member checking became useful data in understanding the implementation of the Biocultural Workshop and the CCoD methodology. It also guided the researcher to make sure that CCoD continued to be based on respect and beneficence of the participants.

There were eight reports during the building relationships stage and pre-ethics approval. After the Biocultural Workshop the researcher had permission from the head of school to use the pre-ethics reports as data for the thesis and there were fifteen reports (sessions) in the fieldwork while enacting the Biocultural Workshop (see Appendix for an example of a report).
Biocultural projects (products and services)

Cultural productions generated through the Biocultural Workshop were collected as data. Despite ‘artefacts and physical materials such as objects in the environment or changes in the physical setting are not quite as commonly used, they are potential source of data for the qualitative researcher’ (Merriam & Tisdell, 2016, p. 163). For this research, the biocultural projects developed through the process provided an indication of relationality between Place, cultural identity and epistemologies of participants. The outcomes are revealed in pictures and in some narratives to explain, or show, this relationality. The cultural productions are a form of project completion towards empowerment, particularly in showing the tangible outcomes of the CCoD methodology. Cultural productions not only can be a source of data but they also hold the story of the journey (Hobbs & Davis, 2013).

Stimulated recall with reflecting thinking with yarning

Stimulated recall is defined as a ‘research method that allows the investigation of cognitive processes through inviting participants to recall their concurrent thinking during an event when prompted by a video sequence or some other form of visual recall’ (Fox-Turnbull, 2009, p. 204). Normally, it is used extensively in educational research (Lyle, 2003) and allows participants to explain their decision making and also provides an opportunity for real life context (Fox-Turnbull, 2009). In this research it was used and articulated as a reflection opportunity and technique to investigate the thought processes and decision making in the Biocultural Workshop with IYW. In the reflection, a presentation, instead of videos or recording, with photographs taken over the process of
the Biocultural Workshop was used to inform the CCoD and to be analysed. One stimulated recall with a focus group session was conducted with the whole class at the completion of the Biocultural Workshop with the IYW and in this session participated all the IYW involved over the project. Stimulated recall allowed the researcher to identify the participants’ insights into the Biocultural Workshop process.

Stimulated recall was used to facilitate students' conversations on their own sustainable co-design practices and process by using photographs. Participants talked about the process as a co- and self-reflection activity, documenting positive and negative experiences. This activity happened after the workshop. The stimulated recall method is important for this research because it is used as a collective meeting, which serves as a method in Indigenous methodologies. Smith, 2012 (p. 132) states that ‘the process of collective meetings, open debate and shared decision making are crucial aspects of tribal research practices’. Therefore, feedback and reflection activities (Foster-Fishman, Nowell, Deacon, Nievar, & McCann, 2005) are crucial in CCoD. The data was collected as reflections of IYW and their own processes while co-designing.

After the Biocultural Workshop was used as a stimulated recall activity in a reflective thinking action, the researcher presented a Power Point about the Biocultural Workshop process with images of the girls in action to show the importance of each step of the process. IYW had the freedom of communicating with the researcher some of the students spoke up, others wrote her a letter or story, others yarnd individually with her and five girls participated in a focus group with the researcher, which was audio recorded. The different and flexible ways of communication encouraged all the IYW to participate and have more reliable results. The IYW were asked to write or speak up during or after the
presentation to share their feelings, the skills they think they developed, the challenges, and their positive and negative thoughts they noticed during the process.

**Teachers and school leaders’ interviews**

Interviews are the most common form of qualitative data collection (Merriam, 2009). DeMarrais (2004, p. 55) describe interviews as “a process in which a researcher and participant engage in a conversation focused on questions related to a research study”, or conversation with purpose. In this seeking of understanding and meaning, the researcher is positioned with the participants as a partner in the discovery and generation of knowledge, which is the CCoD methodology, where both direct interpretations, and categorical or thematic grouping of findings, are used (Merriam & Tisdell, 2016).

The interviews on the CCoD methodology and the project itself with the staff of the school in Australia were held individually after the Biocultural Workshop (see questions in Appendix) where three teachers participated in Australia. The interviews held in Mexico were carried out after the CCoD was presented to the teachers and the questions were different as each site has a different purpose in the research (see questions in Appendix). In Mexico the interviews were in focus groups, as various teachers were involved in two different sessions and in the first session two teachers, in the second session three teachers. There was a total of eight teachers/staff interviewed at both sites. The staff interviews have the purpose to verify the data, know the point of view of the staff about shifts in the participants, and to look at the benefits and limitations of the methodology from another perspective (Merriam & Tisdell, 2016). The teachers and school leaders were also audio recorded by the researcher.
Data Analysis

Data analysis is an iterative and ongoing process connected to data generation, data gathering and theory generation. In this research, the researcher uses a narrative to demonstrate the interconnectedness of the literature, data collected, analytical processes and the conceptualisation of the CCoD methodology throughout the investigation. The research encompassed different phases in analysing the data, as the holistic journey to conceptualise the CCoD methodology shaped it. This investigation uses overlapping data collection with data analysis as an iterative process, which not only gave the researcher a head start in the analysis, but also allowed her to take advantage of flexible data collection, which is required for the research (Eisenhardt, 1989).

The analysis of the data followed six analytical phases that were chronological to the research journey. The data was analysed in a sequential, progressive and iterative manner, generally through immersion in data, coding, categorising and identifying gaps and/or themes (Green et al., 2007). The analysis involved demonstrating its different stages following the participants’ contribution in an ongoing reflective analysis is discussed in the next section.

In this study, the students, school staff and the researcher were positioned as co-researchers to inform and help the analysis of data with multiple benefits to the participants. Indigenous and non-Indigenous people worked collaboratively to build the concepts of a CCoD methodology. To avoid bias from the researcher in the analysis of data collected from the participants’ points of view, IYW and teachers were also considered. The research included all these phases in the data analysis, to overcome the
limitations of the dominant scientific research, where no matter how objective researchers claim their methods and themselves to be, they bring their own set of biases (Wilson, 2008). Considering this matter, and being decolonizing research, the investigation takes into consideration different points of view with three different perspectives: the students, the teachers and the researchers. All having a subjective perception of diverse participants’ experience in the context of their own experience (Clark & Vealé, 2018) within the CCoD methodology. This, as an up-front approach, is about attempting to avoid bias, acquiring credibility, validity and trustworthiness in the research, and achieving objective, fair, and truthful results. Eisenhardt and Graebner (2007) claim that using numerous and highly knowledgeable informants who view the focal phenomena from different perspectives is a key approach in acquiring better outcomes, but Wilson (2008) argues for a cumulative and collaborative analysis.

The researcher responded with respect to the feedback given from the participants. The data analysis inherently integrated a variety of knowledge systems in an attempt to privilege IEK through different perspectives. The aims of the research guided the data analysis and these aims were based on improving and benefiting the harmonious and virtuous collaboration between Indigenous and non-Indigenous people towards biocultural diversity conservation and regeneration.

**Chronological phases of data analysis**

Data was generated and gathered in chronological phases as follows:

1. Reflective and critical analysis of literature review
2. Reflective analysis in data collection
3. Thematic analysis
4. Looking for negative evidence
5. Triangulation of information between participants
6. Creating conceptual and theoretical coherence (CCoD Theory)

**Reflective and critical analysis of the literature review**

Reflective and critical analysis of the literature, discussions with the supervisors and the elaboration of research questions was the first reflective analytical phase.

The preliminary analysis started with the literature review of all the main fields involved in the research: environment, Indigeneity, co-design and critical theory. In this phase, a more accurate and real situation about the need of Indigenous knowledges for biocultural conservation and regeneration was recognised, along with the evident gap in the field of design regarding Indigenous partnership and collaboration. Similar approaches were used from Wilson (2008) for Indigenous partnerships and collaborations. It was found that the gap in incorporating Indigenous methodologies (Tuhiwai Smith, 2012) in the design field brought an opportunity to explore and dovetail these fields forms of collaboration through practice, enhancing partnership and breaking barriers in communication between Indigenous and non-Indigenous people. There were also opportunities to develop new research questions and improve others proposed before.

**The reflective analysis during data collection**

Data analysis occurs alongside generating and gathering of the data (Green et al., 2007). The reflective and critical analysis continued during the data collection through observations and narrative reports of the Biocultural Workshop provided to the teachers.
and the principal. The data collection and analysis continued with the stimulated recall of focus groups and individual reflective thinking with the Indigenous students and interviews with the staff of the high schools.

Flexibility in data gathering enhanced the process in every session, depending on the comments of the participants, the events and happenings during the development of the project. The building of relationships, for instance, became a key element in the CCoD methodology, which was the foundation of a more appropriate and prosperous caring collaboration and trusting partnership.

**Thematic analysis**

For this thesis, a flexible method, i.e. thematic analysis, was used as a method for systematically identifying, organising and offering insight into patterns of meaning, called themes, across the data set allowing to make sense of collective or shared meanings and experiences (Braun, Clarke, Hayfield, & Terry, 2012). The purpose of the thematic analysis was to identify the relevant data to answer the research questions and achieve its aims. In this phase there were three stages involving conceptualising the different points of view of the Indigenous students, the researcher and the teachers, which brought to bear when answering the research questions and from the participants emerged themes that underpinned the CCoD methodology. This process was based on having an ‘interpretative thinking’ of another person’s subjective experience in the context of their own experience (Clark & Vealé, 2018, p. 483), while examining and organising the information of the data gathered of all participants.
The in-depth analysis involved coding all of the interviews and stimulated recall reflections of the participants. At the beginning of this phase, the focus group and interview transcripts were created for a two-part analysis. The first part involved listening to the data in an open coding deductive manner. According to Clark and Vealé (2018), coding is the term used to describe the transitional process between data collection and data analysis. The second part of the analysis involved reading the documents several times in an open coding inducting manner, looking for information, themes and codes depending on the purpose of the analysis (Merriam & Tisdell, 2016). The transcripts were analysed through labelling codes, annotating words, phrases, sentences or stories if they related, represented or captured the essence, features and aspects of data to any of the themes (see Tables in the Appendix). The thematic analysis was divided into three stages of analysis as follows:

First analytical stage: Open coding

The data was analysed in an open coding deductive manner, called ‘pattern coding’ (Huberman, Miles, & Saldana, 2013, p. 86), to identify explanatory concepts and patterns. It involved grouping the data in different categories, themes or clusters by applying deductive reasoning of the co-design practices throughout the multiple stages of building relationships, delivering the workshop and collecting the stimulated recall data. The interviews of the teachers were initially analysed in an open coding manner and pattern coding is meaningful for the research to find emergent key themes (Miles & Huberman, 1984). This process identified emergent themes and developed constructs of the methodology (see Appendix for contrast and coding tables). In this stage, the journey of the participants and the past experience of the researcher are all considered important and
was analysed by listening to the participants and reading the data gathered during the fieldwork.

**Second analytical stage: Deduction analysis**

Deduction analysis (Merriam & Tisdell, 2016) is based on exploring the answers to the research questions and aims to look for key themes through reports, interviews, workshops and stimulated recall with a focus group. The second stage was initiated with open coding following an inductive reasoning approach through the analysis of teachers’ interviews, which informed the research questions. The teachers’ data analysis focused on precise questions and aims given by the researcher when looking for particular findings (Bazeley, 2013) (see Appendix).

**Third analytical stage: Thematic analysis**

In this stage, the themes were generated using a thematic analysis, linking and connecting codes and corroborating the findings to provide reliability in the results (Dey, 2003). This involved continuously verifying relationships, roles, the tone of voice and perception of the researcher (see interview questions and data analysis tables in Appendix). The patterns in the data were characterised by similarity, difference, frequency, sequence, correspondence and causation (Clark & Vealé, 2018).
Looking for negative evidence

Looking for negative evidence helps to define the limitations and challenges of the CCoD methodology (Huberman et al., 2013). This type of analysis is called ‘versus coding’. It identifies the conflicts, struggles and power issues observed in social action, reaction and interaction within the data collected (Saldaña, 2014, p. 26). All limitations are suggestions to be taken in consideration when theorising the CCoD methodology in order to avoid them, and some hold the potential to become opportunities within the methodology.

Triangulation of information between participants

As mentioned before, qualitative researchers can be biased, and possibly never capture an objective ‘truth’ or ‘reality’ (Merriam & Tisdell, 2016, p. 244). There are numerous strategies researchers can use to increase the ‘credibility’ of their findings, or the correspondence between research and the real world. Triangulation, for example, compares and cross-checks data from multiple sources by using several methods of data collection — interviews, observations and documents. According to Merriam and Tisdell (2016), the best-known strategy, in a study, for internal validity is triangulation, usually associated with the use of multiple methods, multiple sources of data, multiple investigators or multiple theories to confirm emerging findings. In this analytical phase of the research, the triangulation of information associated participants’ responses and points of view of the Biocultural Workshop steps and process. Contrasts and comparisons between ways of seeing the Biocultural Workshop were identified by Indigenous students, teachers and researcher. Tables of contrast and comparison are proposed throughout the narrative to enrich the theory and methods of the CCoD methodology.
This phase is proposed to enhance the Biocultural Workshop as a key method and component of the CCoD methodology by identifying the enactment of the sharing, communication and collaboration between participants.

**Creating conceptual and theoretical coherence for the CCoD methodology**

Connection and correlation of information, findings and evidence helped create conceptual and theoretical coherence to the constructs of the CCoD methodology. The analysed data is empirically grounded in a real context, giving credibility, validity and trustworthiness to the theory. Theorising the concepts, and articulating the ontological and epistemology of the CCoD methodology, was completed by connecting past experiences of the researcher, the theoretical framework developed in the literature review, observations, data collected and data analysed while considering the varied points of view of the participants (see Chapter 5). Huberman et al. (2013) describe the process of creating conceptual and theoretical coherence to connecting and grouping this information in comprehensive and more abstract patterns, putting the facts together, moving from metaphors and interrelationships to constructs and theories.

**Sample Selection of Participants and Sites: Two Contexts, Australia and Mexico**

This research investigates two particular contexts in Australia and Mexico, first, by studying a specific social group, i.e. IYW from high school in Australia over a period of two months during the building relationships stage. Second, by interviewing high school
teachers in Australia and Mexico. This investigation attempts to conceptualise and articulate CCoD methodology as a transferable and trustworthy approach through two contexts, making it an innovative and unique inquiry. It is the respectful methodological approach of intersecting the ways of knowing and lived experience that substantiates this inquiry.

The research was undertaken in two Indigenous high schools in Megadiversity countries, Australia and Mexico, where the majority of the population enrolled are Indigenous people. They were also chosen because the researcher is enrolled in an Australian university, and Mexico is the researcher’s home country. Additionally, the schools were chosen due to their established relationship with Dr Laura Barraza, the researcher’s initial PhD supervisor, who worked through different universities in both countries, where she collaborated in different researches in fields like environmental education and social science, which facilitated the relationship with the institutions and the IYW. The participants were IYW and teachers form these schools and after the building relationship stage, in selecting the participants only the Indigenous students who were willing to contribute to the research project were chosen. The teachers were chosen if they agreed and understood the demands of the study. Both teachers, students and the school’s principal/guardian signed a consent form in order to participate, which was also countersigned by the head of the school.

This single case study uses data collected in two different sites, one informing the other, in order to understand the different situations that CCoD can be applied to and in order to discover similarities and compare complex Indigenous biocultural diversity contexts in Megadiversity countries. This validation proves that the CCoD methodology can be
transferrable worldwide, despite the differences in ontologies, epistemologies and background. Remenyi (2013) states that normally two contexts are often considered not to be sufficient and in this research, it was decided to select only two communities due to complex logistics for data collection, financial constraints, time limitations and, finally, to allow a deeper analysis of the data collected.

As in case study methodologies, it is important to specify the population that reduced extraneous variation and clarified the domain of the finding (Eisenhardt, 1989). The sample of participants for this research was a maximum of 30 people. This number is justified as it considers a diverse and rich sample size while not disrupting the organisation of the school, and it also includes all categories of IYW attending the high school chosen in Australia, from 12 to 17 years old, as well as teachers and staff from the school.

**Comparison and Similarities Between Sites**

It is important to recognise the significance of having two different sites as well as differences and similarities between the sites to understand the different situations that CCoD can be applied to, and also to compare complex Indigenous biocultural diversity contexts. A diverse set of explanatory factors and cross-cultural comparison were used to validate and construct the CCoD methodology theory: the next tables, Tables 2, 3 and 4, describe the sites in order to understand the different situations that CCoD can be applied to.
### Table 2. Features site Australia

<table>
<thead>
<tr>
<th>SITES AUSTRALIA</th>
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<tbody>
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<td><strong>SCHOOL</strong></td>
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<td><strong>STUDENTS</strong></td>
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<td><strong>TEACHERS IN THE SCHOOLS</strong></td>
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<td>SITES</td>
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<td>STUDENTS</td>
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</table>
### Teachers in the Schools

- **50% of the teachers are Indigenous**
- Indigenous teachers incorporate community knowledge in their classes, Non-Indigenous teachers do not

Table 4. Similarities between sites

<table>
<thead>
<tr>
<th>SIMILARITIES BETWEEN SITES</th>
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</thead>
<tbody>
<tr>
<td><strong>SITES AUSTRALIA &amp; MEXICO</strong></td>
<td>Both sites are located in a Megadiversity country context and have an extensive amount of biocultural diversity</td>
</tr>
<tr>
<td></td>
<td>Both have forests as a main surrounding natural environment, even if they are different kind of forests. In Australia we find a Eucalypt forest, while in Mexico a Mesophilic rainforest</td>
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<tr>
<td><strong>SCHOOL</strong></td>
<td>Both schools are located on Indigenous land</td>
</tr>
<tr>
<td><strong>SCHOOL PROGRAM</strong></td>
<td>They share some similar subjects with the exception that the Australian site, is based on Aboriginal culture</td>
</tr>
<tr>
<td><strong>STUDENTS</strong></td>
<td>Students’ age ranges from 12 to 17 years old in both schools.</td>
</tr>
<tr>
<td><strong>TEACHERS IN THE SCHOOLS</strong></td>
<td>Many teachers are not Indigenous</td>
</tr>
</tbody>
</table>
The differences and similarities are mainly related to the environment/land, school settings, educational programs, students’ gender, teachers’ and staff background, and positionality within the data collected in the interviews.

The sites were chosen because of the number of similarities, which are important for the research. For example, both sites are in Megadiversity countries and have an extensive amount of biocultural diversity, as they are placed on Indigenous land, both sites follow Indigenous culture and costumes, and they both hold Indigenous knowledge within Place.

There is also a number of differences that can either limit or help with the transferability of CCoD methodology. The main differences between the sites regards the gender of students, with the Australian site being a girls only Aboriginal boarding school. At this school, students come from all over Australia and speak different languages on top of English, which is the language taught by the school. The school has an elders’ committee that sees for the best interest of the girls in terms of Aboriginal education. The students are supported and looked after by the head of the school, the house parents and the teachers while on school premises. By contrast, the Mexican school enrols both girls and boys with both Indigenous and non-Indigenous backgrounds, who live in the community with their families and attend a day school. They are familiar with the community and natural resources which surround them, and they are supported and protected by their families and community. Only some of them speak their mother language in addition to Spanish, which is language taught by the school and the official language of Mexico. The participants preferred language of instruction in the research was English in Australia and Spanish in Mexico.
The educational programs across the two schools also differ. In Australia the Aboriginal boarding school uses the Australian Curriculum (AC) but provides an integrated educational model of education, culture and well-being so that students develop academically, culturally and socially within their Aboriginal culture. This, being a culturally responsive pedagogy. In comparison, the school in Mexico has an educational program that is based on The Ministry of Public Education (La Secretaría de Educación Pública), which is applied to all schools in Mexico as a basic education system where Indigenous knowledges are not considered. Mexican teachers have the freedom to teach Indigenous contents and knowledge, and the Indigenous teachers incorporate ancestral knowledge in their classes while non-Indigenous teachers do not.

In Australia the head of the school has an Indigenous background and all the teachers are non-Indigenous, but they are all passionate about Aboriginal culture and very respectful of the ancestral knowledge. In comparison, in the Mexican school 50% of the teachers are Indigenous people who follow culture and knowledge, and some also speak their mother language, while the other 50% are non-Indigenous and not aware of cultural differences.

The interviews acknowledge this varying positioning teachers have towards their own teaching. In Australia, teachers were interviewed after the Biocultural Workshop, so they had the understanding and the experience of the methodology process. In Mexico, the teachers were interviewed after a presentation of the proposed CCoD methodology from its application at the Australian site, so they had no direct experience of the CCoD methodology.
The Journey to Conceptualise Critical Co-Design

Methodology

This research follows three journeys. The first one identifies the research journey using a case study methodology to theorise CCoD. The second one, is the participants’ journey to understand and practice the Biocultural Workshop. Lastly, the researcher’s journey over the CCoD process which is revealed in Chapter 5. They are relational to each other and this section describes the first two journeys, the participants’ and the research journey, through the theorisation of CCoD through a case study research methodology grounded in decolonizing research (Tuhiwai Smith, 2012).

The process of the CCoD - Case Study and Sites

1. This journey has different stages, as it is informed by different participants throughout the process. The participants contributed to inform the theory of the methodology as follows: The Indigenous students co-designing practices in collaboration with the researcher in Australia
2. Teachers interviews from two Indigenous high schools in Australia and Mexico
3. The researcher’ analysis and point of view as an iterative reflective process in each stage.

A cyclic co-reflective process informed every stage to the theory development of the CCoD methodology considering different points of view while privileging Indigenous ontologies and epistemologies. The journey process was completed in five different stages (see Figure 8).
In the first stage, the CCoD proposal, the researcher proposed the CCoD methodology and the research design and the researcher designed the methodology and methods to investigate and explore the CCoD methodology as a qualitative case study in two sites, Australia and Mexico.
In the second stage at Site 1 (Australia), the proposed CCoD methodology was informed through practice and reflection with students from Indigenous settings within an Aboriginal high school. Biocultural projects were developed during the Biocultural Workshop and stimulated recall was used to reflect on the co-design process. The vision and values of the school were documented as well as a step by step description of the fieldwork to arrive at the proposed CCoD methodology.

The third stage of refining the CCoD methodology was informing through the data gathered in the fieldwork and practice in Australia (site 1). The CCoD methodology was refined with the outcomes in a collaborative process involving all participants - students, teachers and researcher and the data analysis, along with a presentation of the CCoD methodology explaining its general use and process to the second site, Mexico.

The fourth stage, which occurred at both sites, informed the CCoD through identifying the teachers’ point of view and through interviews about the practice and theory. After the Biocultural Workshop in site one, Australia, the teachers were interviewed. After this, contact with the Mexican school was made where the CCoD was presented to the Mexican participants in order to further validate the methodology.

The final stage sharpened the CCoD methodology using an iterative reflective and analytic process, returning to the literature and making reference to relevant fields of knowledge. Developing the final CCoD methodology as new knowledge was proposed as a collaborative endeavour which can be applied to other communities and Indigenous

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contexts. The practice is revealed by explaining the process in the two different sites, Australia and Mexico.

**Site 1. Australia - Aboriginal College, Victoria**

**Description of the site**

This section describes the site in Australia. The context in Australia is set in a high school Aboriginal boarding College, in the state of Victoria. The high school is a women’s Aboriginal College, provides a holistic education program in a respectful learning environment founded on quality relationships and boarding experience for young Aboriginal women who come from Aboriginal communities in urban, regional and remote Australia, and who are in the middle of their schooling years (Years 7-12). The curriculum is based on the Australian Curriculum (AC) and provides an integrated scholastic model of education, culture and well-being in which students can develop academically, culturally and socially (Worawa Aboriginal College, n.d.; Worawa College, 2016).

The CCoD methodology supported the curriculum content of the school and addressed some of the general capabilities which are important for the AC, such as, critical and creative thinking processes, and the development of personal and social capabilities with ethical, respectful and intercultural understanding. This research also supports the Melbourne Declaration on Educational Goals for Young Australians (MCEETYA 2008), encouraging young students to be successful learners, confident and creative individuals, and active and informed citizens. The Aboriginal college is a boarding school that caters for students from different Countries within Australia.
A cornerstone of the Aboriginal College educational program is the affirmation of the student’s existing knowledge and understandings. This starting point, when linked to the Aboriginal College values of Respect, Responsibility, Relationship and Rigour, encourages and challenges students to strive and achieve their full potential. The school has been involved in some research to empower the female youth (Worawa Aboriginal College, 2016). The Aboriginal College model has been developing a comprehensive understanding of the complexities of Indigenous education. It focuses on the effectiveness of the overall education provided and also to the recruitment, professional development, support and retention of teaching and non-teaching staff. The Elders committee provides cultural guidance to students and staff with an Aboriginal perspective to ensure preservation of culture and well-being. The Aboriginal College learning model is grounded in Aboriginal values and ways of knowing, being and doing. There are four core values in this type of learning:

- **Relationship** as a way of being, which is grounded in discussion-based learning (story, experience, connectedness), collaborative learning (peer relationship), social supportive learning (partners & community) and holistic learning (integrated education, culture and well-being)
- **Responsibility** as a way of knowing, which is based on individual learning (sense of capacity to learn), independent learning (autonomy), discovery learning (creativity and self-expression) and observation-based learning (learning by doing)
- **Respect** as a way of valuing, which is connected to learning (land, community, culture and economy), narrative-based learning (storytelling), place-based learning (Country), and cultural value-based learning (law and spirit)
- **Rigour** as a way of doing, which involves creative and adaptive learning (innovation plus resilience), hands-on learning (kinaesthetic/development of life skills), problem-based learning (problem-solving), and scaffolded learning (ensure skills mastery).
These four core values of the Aboriginal College have the potential to ontologically connect to the CCoD Conceptual Framework.

**Ethics and Fieldwork Protocol Process**

The process in the Australian site was divided into different sections with subsections, diagnosis, conceptualisation and preparation, implementation (fieldwork), evaluation and reflection and reporting back to the school (see Figure 9). Each of these sections is explained after Figure 9.

![Figure 9. The process of the Australian site](image_url)

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Finding and researching the institution to collaborate with</th>
<th>Meetings and logistics</th>
<th>Building relationship with girls</th>
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<tbody>
<tr>
<td>Conceptualisation</td>
<td>Project design and negotiations of mutual benefits and goals</td>
<td>Logistics</td>
<td>Ethics</td>
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<td>and preparation</td>
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<tr>
<td>Implementation</td>
<td>Fieldwork and data collection</td>
<td>Co-design Workshop</td>
<td>Project closure</td>
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<td>Evaluation</td>
<td>Self-Reflection</td>
<td>Co-reflection</td>
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<td>Reflection</td>
<td>Weekly reports</td>
<td>Last presentation</td>
<td>Delivery of thesis in PDF</td>
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<td>Reporting Back</td>
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Diagnosis

• Finding and researching the institution (high school) for collaboration

The first approach with the high school happened through one of the researcher’s supervisors, Dr Barraza, who was researching for years with the institution. This research made use of the relationship between Dr Barraza and the school as it was envisaged that the research could bring a mutual benefit to all parties participating in the research.

• Meetings and logistics

The first process was the researchers’ acceptance by the head of the school/Elder. This process with the teachers and Indigenous girls took seven months. It started with an email from Dr Barraza, the researcher’s supervisor at the time, introducing the researcher to the principal. The initial answer from the head of the school was not positive as the school was involved in another research that brought little benefit to the girls and the school. Clearly, the acceptance was the first challenge to overcome.

In the following email, the researcher asked for an opportunity to explain the project and meet with the head of the school/Elder, so she could understand better the research and the real benefits for the girls, the school and the research as a mutual benefit outcome, foremost requirement for the investigation and crucial element for the CCoD. She agreed to meet and talk about the project. This stage took three weeks of sending emails back and forth.
A meeting with the head of the school/Elder of Aboriginal College, the principal supervisor of the researcher, Dr Auld, and the PhD researcher was finally arranged and in the meeting the researcher explained the project with the potential benefits for all parties involved. The head of the school asked a range of critical questions about the goals, benefits and requirements to participate in the research. All participants negotiated the goals and mutual benefits before the research could begin. The head of the school asked to include as a requirement that, before starting with the project, there would be a stage of building relationships with the girls and the teachers who would be involved in the project. This gave everyone a chance to evaluate the potential of the research. According to the school management, there were three other research programs running at that time.

• **Building relationships**

The building relationships stage was not part of the design of the research, it happened as a result of a request from the head of the school in Australia. While building relationships, the researcher supported one of the classes for two trimesters, engaging with the girls and the teachers through mutual learning, exchanging culture, doing educational activities together (arts, presentations, exchange knowledge), and yarning about life and goals. During this process, the girls learnt about the diversity of Mexican culture, about co-design and the importance of some design concepts and processes in a personal and professional approach. On the other hand, the researcher learnt about the diversity of Aboriginal communities, culture and nature, Aboriginal art and occupations, Australian Curriculum and values of the Aboriginal school by conversing with the girls and the teachers involved. This process was important not only to exchange knowledge but also to address the plurality of knowledges and cultures present (Angus, 1997), and gave the
researcher a precious insight in unpacking the power relations and colonisation that framed the study.

At the end of this process, the institution and the participants agreed to participate in the research in order to support the school curriculum. The head of the school provided a letter for the Ethics committee to support the researcher and its investigation.

In this phase, there were not only mutual learning and exchanging of knowledges, but also the development of strong relations involving feelings, emotions, empathy, trust and confidence between participants and the researcher. An important emotional aspect of the project was reached in the building relationships stage when the teachers and the head of the school were looking for this respectful approach in the research itself, bringing to the table past non-culturally sensitive and non-respectful approaches in other research projects as well as the history of relationships between Aboriginal and non-Aboriginal people. This step can be seen as part of a decolonizing research and this study does not underestimate the affective and emotional dimensions becoming part of the methodology.

**Conceptualisation and preparation**

- **Design of the project and negotiations of the mutual benefits and goals**

After the process above, the researcher had another meeting with the head of the school and the teachers, to make the final decision about participating in the research. In this meeting, all parties agreed to participate and be part of the journey and all parties decided on the scope and limitations of the project, defining the mutual benefits that the research should bring for participants and organisations involved.
The agreement of mutual benefits accorded and negotiated with the head of the school and the teachers in a meeting after the building relationships stage is listed below. These points were presented before the enactment of the Biocultural Workshop:

**Girls:** The main benefits expected for the Aboriginal students from this research are:

- Enhancing knowledge, skills (cooperation, curiosity, creativity), reflective thinking, empowerment and environmental practices;
- Developing capacities to co-design, co-create and co-develop environmental projects (products and services), reaching tangible outcomes regarding their needs, opportunities, interests and desires;
- Developing resilience, confidence and a sense of accomplishment through project completion;
- Aboriginal young women will develop active learning at school, developing self-esteem and pride in their cultural knowledge and development of cultural identity in a sustainable way. Cooperation and work in real biocultural projects can lead to acquiring leadership skills in local communities and in the Australian society;

- Discovering different skills that can be used for personal and professional benefits:
  - **Personal benefits:** empowerment, experience for future work, self-confidence, consciousness, connexions and developing passions.
  - **Professional benefits:** experience for the near future and evidence of real outcomes to develop skills of collaboration and presentation of a real project, respect and harness Indigenous Ecological Knowledge (IEK) in the Australian society, enhance the values of responsibility, respect, relationship and rigour;

- The key goal is to encourage the girls to recognise ways in which they can build a creative business enterprise through collaboration with other parties. This is expected to be achieved through participation in a project all the way through to
completion. Products and services involved, for example, furniture, fabric, accessories, clothing, housing, tourism services and handicrafts. All by privileging Aboriginal elements, themes and IEK.

**School:** The school is expected to acquire various concrete outcomes, such as:

- Empowering the students to build a creative business enterprise through collaboration with other parties. This will be achieved participation in a project all the way through to completion.
- The school will learn a co-design process which will act as a model system that can be applied by the girls and the school in the future. Thus, developing a school model for collaborative enterprise projects to include universities, schools, commercial or industrial companies;
- The research explores a meditative creative process within a supportive and rich learning environment. The process will range between the ideal and the real outcomes.
- Visual documents (presentation of the process and outcomes). Visual and written journaling as a record of the creative and business development process;
- The researcher will be in communication every fortnight for the duration of the project with the school, regarding all stages of the research through reports and verbal communication;
- The project will explore ways of communicating and gathering constructive feedback for project improvement;
- As the Aboriginal College is part of the Australian Curriculum (AC), and the research supports the curriculum content in the school, this project will address some of the general capabilities that are important for the AC, such as, critical and creative thinking processes, development of personal and social capabilities with ethical, respectful and intercultural understanding;
- The project will support the Melbourne Declaration on Educational Goals for Young Australians (MCEETYA 2008) encouraging young students to be successful learners, confident and creative individuals, and active and informed citizens.
Research: The research is expected to acquire various concrete outcomes, such as:

- The research will develop evidence informing the Critical Co-design methodology theory;
- The research will deliver a benefit to the learners in the production of products and services that empowers their social futures, which is integral to this methodology;
- The research will analyse how the students discover and address different opportunities, challenges and environmental problems by privileging the important constructs of relationality they have with place and Country; the methodology of CCoD will be developed in the interface of intersecting knowledges.
- The research will facilitate the co-design, co-creation and co-development of diverse environmental products and services that provide a space for the participants to critique their own practice. Through this, the research aims to document shifts in the participant’s practice that is central to the effectiveness of the CCoD methodology. This will form the basis of the new knowledge of the CCoD methodology as a direct outcome of the collaboration between Indigenous and non-Indigenous people.

The main limitations in the negotiation were time, place and how to fit CCoD in the educational program; hence, time and flexibility were crucial in this stage, as without these elements the research could not have happened. Time had to be flexible matching the timings of the school and the specific classes and Place had to be flexible to the possibilities and availability of the classrooms and in fitting in a subject decided by the organisation.

- **Logistics**

The research fitted in the school program, being a flexible and adaptable research. The institution decided that the CCoD methodology could fit in the Caring for Country class,
as it aims to develop students’ awareness, understanding and skills in sustainability projects. It takes elements of natural science, humanities, environmental education and systems thinking principles to create an opportunity to explore ideas, understand problems and allow students to become creators of change through recycling, education, creation and problem-solving. The program explores local and international issues with First Nations focus, as this class has a place and time in the school program, the researcher had to fit in and be flexible to participate according to the agreement. CCoD was proposed to fit in with different projects thanks to the flexible nature of its methodology. CCoD projects cannot stand in isolation, as they explore possibilities and are planned to link different areas, professions and contexts together, being an integral methodology.

The logistics, timetable and planning of the CCoD project was organised and negotiated in a collaboration between the teachers and the researcher, according to the time and space available in the class involved. Both parts were understanding and flexible in making the project happen.

- **Ethics connotations, limitations and negotiations**

The development of the Ethics application was a respectful part of the investigation as well as a fulfilment of the requirement of Human Research activities in Australia. The ethical approach (B. Martin et al., 2016) aligns to the key principals founded in the CCoD Conceptual Framework. For the Ethics approval the committee asked for a letter with the research approval form from the school. As a condition to signing the approval, the school asked for a building relationships period with the researcher. Through the challenging process, the researcher realised the importance of the building relationships stage to
understand and develop empathy and respect with the participants and the community involved. Without the Ethics process, the building of relationships would have happened differently and would have reduced the time available to engage with the participants. Without this process the methodology would have been different. Despite the importance of this prerequisite, and the benefits for the research outcomes (NHMRC, 2007), due to the time and efforts needed to get advice from different people, community and Ethics committee, the process for this research was almost a failure. A lot of time and energy was spend on the Ethics application, being a long process as to work with Indigenous Australians (Australian Institute of Aboriginal & Torres Strait Islander Studies (AIATSIS), 2011), precisely with Aboriginal female youths, is considered a ‘high-risk’ activity.

The process was long, especially because the Ethics committee rejected the application the first time asking the researcher for several clarifications. As mentioned before, the research is high risk as it involves Indigenous Australian young women, who are under 18 years of age. There were many issues in gaining consent from the girls to participate in the project: The Ethics committee requested parental consent of all the girls and meeting with the Elders of all the communities involved for example, which was not possible in this instance.

I responded to the ethics committee knowing I had the support of the head of the school/Elder, who from now on I will be referring to as Aunty Lois, in the Ethics application and the research application in the school. The requirement from the Ethics were impossible for the researcher to meet, firstly, because of time and financial limitations. Second, the school stated that it would have been impossible to physically obtain the consent of the parents through who were scattered through multiple Aboriginal
communities in remote areas with multiple language barriers. They stated that the only way to implement the project was through the consent provided by the guardian of the girls, who is the head of the school/Elder, and who always sought the students’ best interests and has them under her guardianship. The consultation to resolve this issue involved the head of the school and an Aboriginal advisory committee within the school, which included community leaders within Aboriginal society from different states and territories of Australia.

At some point, the project was at risk because, understandably, the head of the school/Elder, and guardian of the girls, and some staff of the school involved in the project, felt the requirement of the Ethics committee was intrusive and disrespectful and made the research impossible. Despite this, they supported and recognised the potential for the research as a way to promote collaboration and reconciliation between Indigenous and non-Indigenous people in a practical and theoretical approach as this research supports reconciliation, which in Australia is an unfinished and ongoing process. Thankfully, in the end, the Ethics committee approved the project in compliance with the National Statement on Ethical Conduct in Human Research in 2007 on the 1st of November 2017.

There are so many policies, rules, and administrative and political requirements (Australian Institute of Aboriginal & Torres Strait Islander Studies (AIATSIS), 2011; NHMRC, 2007) that make the process of the research difficult to start and/or complete successfully. From my point of view, as a researcher, there are two critical stages of the Ethics approval approach. First, the researchers’ acceptance among the Indigenous peoples, community, leaders, school and teachers, and participants in general, involved in the process (B. Martin et al., 2016). And second, the acceptance of the investigation as a
respectful, humble and professional activity for the Ethics committee (NHMRC, 2007). Ethics should be premised by building relationality first and foremost with Indigenous peoples (B. Martin et al., 2016).

In Australia, Indigenous Australians have the right to claim Intellectual Property on their Heritage, Traditional Knowledge and Traditional Cultural Expressions. This is an important right set out in Article 31.1 of the Declaration on the Rights of Indigenous Peoples (Kimberley Land Council, 2011). Within the wider communities, those engaging with Indigenous Australians have the responsibility to conduct activities using good practice and ethical approaches (standards and processes), as well as respect and observe their protocols and values (Smallacombe et al., 2006). On the other hand, in Mexico, there are no policies or practices to conserve IEK. Local knowledge is acquired through the learning process that exists differentiated according to age and sex (Toledo & Barrera-Bassols, 2008).

**Implementation**

- **Fieldwork and data collection**

The recruitment process in Australia came after Aunty Lois’ requirement of building relationships with the girls and the teachers was requested. In the end the ethics approval took eight months to be achieved and girls and teachers had the opportunity to decide whether to participate or not in the research. The data was collected through the Biocultural Workshop, which is included in the methods of the CCoD methodology, which took two months to be completed.
• Biocultural Workshop

The Biocultural Workshop used for this investigation was developed by the researcher as a method for the CCoD methodology to create and enhance collaboration between Indigenous and non-Indigenous people. The workshop took place for two months through 14 sessions and 36 working hours. Sixteen IYW and three teachers participated in the workshop. Participants co-discovered, co-designed and co-developed biocultural projects collaboratively with their peers, the researcher and the teachers. The workshop proposed for the participants to discuss the projects in a respectful, holistic and flexible way, and to research ideas and information about the project to work with from different sources. In co-designing, an iterative and creative step, the participants generate proposals in response to interests and opportunities of the community in order to create solutions. Finally, in the co-developing stage, it was proposed for the participants to create and develop physical projects, that is the materialisation of their ideas. During this process various elements that should be encouraged and stimulated in order to achieve successful project completion were considered, such as time, patience, commitment, creativity, interest, experimentation and passion.

• Project closure

At the end of the workshop, the participants, IYW and the researcher organised an exhibition of the biocultural projects. The projects were displayed and presented to the other participants, teachers and school guests. Participants had the opportunity to show their achievements through their projects, feel pride of their culture as well as get feedback from other people who were not involved in the process. This step was designed to be a key component of the process, to enable participants to visualise their successes, failures
and project completion, as well as their hard work in order to acquire self-determination and empowerment. This step articulated the materialisation of CCoD methodology.

Evaluation and Reflection

- Self and co-reflection

The self- and co-reflective thinking activity was proposed through a PowerPoint presentation about the Biocultural Workshop, which was presented by the researcher to all participants. The aim of this presentation was to show participants the whole workshop process altogether, focusing on each step and their outcomes in order to reflect on the process itself. This activity was proposed to revive, remember and stimulate participants’ feelings, creativity, needs, challenges, struggles, opportunities, achievements and project completion in a certain amount of time and to encourage self- and co-reflection during the session. In a reflective thinking activity, the participants could have a self- and co-reflective moment with freedom of communication. Flexibility and freedom to express thoughts are essential when considering different personalities and forms of expression, as well as when gathering reflections and data from each participant.

The teachers were interviewed about the CCoD methodology in a reflective manner in order to obtain feedback, information and different points of view, and to make the development of the methodology and new knowledge collaborative.
Reporting back

- **Weekly reports**

During the entire process of the research, the head of school, the Elders’ committee and the teachers received weekly reports of the sessions to keep informed about the progress of the research. As mentioned above, this was a fundamental requirement of the school to work with the research in the negotiation stage.

- **Last presentation**

It was expected from the researcher to do a PowerPoint presentation (different to the reflective thinking activity) on the process and outcomes of the research to bring the Biocultural Workshop to a closure, acknowledging the participants and thanking the school for their participation in the research. As a complementary reporting back, the finished thesis it is intended to be delivered to the school once completed.

**Data collected**

There were three main types of data gathered during the process (see Figure 10). First, the weekly reports of the fieldwork written by the researcher for the school management and teachers, including her observations, process and progress. These reports included the researcher’s point of view, the stimulated recall activity, with the students’ point of view, and the interviews, with the teachers’ point of view (see Figure 10). Second, there was data from the stimulated recall reflective activity about the Biocultural Workshop process, carried out in a focus group with the students. Lastly, the interviews of the teachers aimed at collecting evidence about the Biocultural Workshop and the CCoD methodology.
Biocultural Workshop and stimulated recall - Students point of view

The steps of the workshop and stimulated recall were:

Step 1. The researcher, students and teachers participated in the Biocultural Workshop.

Step 2. The students reflected in a stimulated recall activity within a focus group and different sources of communication to collect data to enrich the methodology with the students’ points of view. The project is designed for the students to give feedback and share their point of view on the project.
Interviews - Teachers point of view

The steps for the interviews with the teachers were:

Step 1. The researcher, students and teachers participated in the Biocultural Workshop.

Step 2. The teachers were interviewed by the researcher about the process and outcomes of the CCoD, giving feedback to enrich the methodology from the teachers’ points of view.

Site 2. Mexico - Secondary Ixtlan De Juarez, Oaxaca, Mexico

Description of the site

The site in Mexico helped to inform the CCoD methodology through the insights of teachers from a different Megadiversity country. The rationale to collect data from this site was to increase CCoD reliability and enhance the transferability of the methodology. The Biocultural Workshop was conducted only on site one, Australia, and in site two the teachers were interviewed about their thoughts on the CCoD methodology, which was explained and clarified after enacting it in site one.

The site in Mexico was located in the state of Oaxaca, the state with the highest Indigenous population in Mexico, with 32% (INEGI, 2010). Oaxaca also accounts for the greatest biocultural diversity in the country and is the fifth largest state in Mexico. Women accounted for 52.2% of the population in Oaxaca (CDI, 2010), but they stop going to school because they are engaged in different kinds of labour and jobs, the most common being handicrafts, industrial commerce, employment, and personal and domestic services.
Child labour continues to be present in Oaxaca, affecting a significant proportion of the population under 18 years of age (INEGI, 2010; UNICEF Mexico, 2013).

Within the state of Oaxaca there are many different Indigenous groups. This research collaborated with a high school in the community Ixtlan de Juarez, where the name Ixtlan comes from the Nahuatl language and means ‘place of fibres.’ For some people it is also called Laa Yetzi, that in the Zapotec language means ‘thick leaf’ or ‘magueyera’ (Municipio de Ixtlan de Juarez, 2005). Ixtlan is a Zapotec Indigenous community in the mountains of the state of Oaxaca, Mexico, one and a half hours drive from Oaxaca City, the capital of the state. Ixtlan is placed in a mesophilic mountain forest land called mountainous system of northern Oaxaca or ‘Sierra Madre de Oaxaca’ (SAGARPA, 2009, p. 9). It is estimated that Indigenous communities are owners of 80% of Mexican forests, and they have been recognised as a model of sustainable forest management nationally and worldwide. Hence, there is a belief that investing in education and working in management and conservation of forest natural resources contributes to Indigenous cosmovision and a communal society (CCMSS, 2001; UNSIJ, 2010).

Ixtlan is a rural community and has a population of 7,674 people, where 3,919 of them are women. 33.3% of the population lives in extreme poverty. In 2010, 4,282 people spoke an Indigenous language (SEDESOL, 2010). ‘The Indigenous population in Ixtlan is 4,403 people, representing approximately 60 per cent of the municipal total. The predominant language is Zapotec’ (Municipio de Ixtlan de Juarez, 2005, p. 26).

The investigation is conducted in the high school called Secondary Ixtlan de Juarez. There are only five secondary schools in the community, and they account for 1,269 students.
with 34 teachers across all schools. Despite the fact that there are plenty of schools to meet the demand of the community, education is poor in quality (Municipio de Ixtlan de Juarez, 2005). In Mexico most rural schools have scarce resources and only have one or two classrooms for all grades. Secondary Ixtlan de Juarez is one of the fortunate schools that have better resources to teach and different classrooms per grade.

This research is focused on the potential to engage Indigenous youth because, as mentioned by Barraza and Pineda (2003), Mexican youngsters have been largely ignored in environmental education research. Although Ixtlan de Juarez is recognised as an Indigenous community, new generations are losing their traditional culture and replacing it with a more western lifestyle (Ruiz-Mallén et al., 2009). According to SAGARPA (2009), there is a loss of identity due to the lack of integral education of the population as well as a lack of development of skills and capacities.

Some customs, though, are still alive in the community, like traditional dances, theatre, traditional cooking, agriculture, festivities, religion, beliefs, medicinal plants, natural healers, myths, legends and white and dark magic practices. Through this ancestral knowledge the community looks after the natural environment surrounding them by investing in forest management and they also have a new university with sustainable Bachelor's Degrees supporting new students in soil research, management of mesophilic forest and natural resources management. Traditional knowledge in the community is spread by ‘Dichos’ (sayings taught from generation to generation), by Indigenous languages in which teachers spread the knowledge unconsciously, by the ‘Sindicato’ (Labour union), the ‘Trueque’ (barter in some places), and four kinds of community work:
Gozana= Particular support and benefit– one common benefit (ex. builds a house)
Guelaguetza= Social benefit can be cultural or festivity (ex. Plant)
Tequio= Community work for a communal benefit
Sinalada= Community work but for long term projects (ex. 1 month or more)

Ethics and Fieldwork Process

For the Mexican site, the researcher submitted an Ethics amendment to the original Ethics application. The ethics committee found that the Mexican project complied with the National Statement on Ethical Conduct in Human Research on 2007 on the 6th of March 2018.

The purpose of including the Mexican site in the research was to refine the CCoD methodology using feedback from educators from a different background, so that Indigenous peoples with different culture, knowledge, resources and educational structures helped to shape the ontological constructs of CCoD methodology. Here, there was no interaction with the students and the purpose was simply to report to the teachers in Mexico on the methodology developed in the Australian school, in order to understand the differences in perspective on the potential for implementing the CCoD methodology in their context. At the Mexican site, the head of the school and five teachers participated and were interviewed after viewing the presentation of the CCoD developed in the Australian site. The process for this site included: presenting the CCoD methodology and sharing findings from the Australian site to generate insights on the CCoD in the participants. Also, the teachers were asked to give their perspective and feedback on how they thought it would work in their context.
The theory is emergent in the sense that it is situated in and developed by recognising patterns of relationships among constructs within their underlying logical arguments, thus, being objective and ‘honest.’(Eisenhardt & Graebner, 2007, p. 25). It was essential for this research to be conducted in and to include multiple points of view from different contexts, countries and schools, in order to enhance transferability and validation of the new knowledge.

The general process of the project in Ixtlan de Juarez, Oaxaca, Mexico (site 2) is shown in Figure 11.

Before the fieldwork, Dr Barraza contacted the principal of the high school about the project through a series of emails and messages, she introduced the project to the head of the school and arranged the possible timeframe to go to the community and collaborate on the project.
There were four main stages during the fieldwork:

1) Observations
2) First contact
3) Second contact and presentation
4) Interviews with some yarning. This stage is written as a narrative to explain the process, as multiple complexities arose during the practice.

Observations

I first arrived at Ixtlan de Juarez first as a neutral observer, perceiving the way of living in this particular society to understand better the community, the people, their customs, language, forms of communication, believes, occupation, cultural patterns, etc. At that time, I could not make any contact with the head of the school because the school was closed due to an earthquake, that had damaged the school beyond repair as the school was positioned on a ‘falla’, or geological fault. Thus, the school needed to be relocated to a new place that did not exist yet at the time of the fieldwork and the researcher started to fear the possibility of not achieving the goal of the research.

First contact

It was challenging to find the head of the school, but with help from the community and a university teacher, I found one high school teacher who was working at the school. He told me that the teachers were attending a workshop in Oaxaca City, which, as mentioned before, is an hour and a half drive from Ixtlan, and they would not have returned to the community until the following week. In the meantime, I kept studying and observing the culture.
When teachers finally returned, we, the head of the school and the researcher, arranged an appointment but the municipal president suddenly arrived to the village on that day without prior notice, changing the availability of the head of the school, hence, the pre-arranged meeting could not happen. The following two days were dedicated to a big celebration for ‘la Virgen de la Asunción’. While this was very interesting, it did not have relevance to the study. I had not had any contact with the head of the school and teachers yet, and I had no data to work on to develop the CCoD methodology.

**Second contact**

After the celebration and the other unexpected events, the head of the school gave me another appointment and we finally managed to meet in the University building, as the school was not operational due to the earthquake, as mentioned before. I was welcomed, shown the educational plan and given a tour of the university. All this happened while they were organising to build a new high school and trying to get financial support from the municipal president, who eventually approved the funding to build the new teaching space.

**Presentation and interviews with some yarning**

The head of the school arranged a for a few teachers, who might have been interested in the CCoD methodology, to participate in the project. After the presentation, I interviewed them in two groups, over two days, in a focus group interview. During the interviews with
yarning, the discussions included understanding of culture, cultural heritage, traditions, history of the community, legends and spirituality in a yarning approach.

**Data collected**

After first meeting the five teachers we had some yarning, then I presented the CCoD methodology and I interviewed them. Almost all of them identified as Indigenous people, which was a contrast to the Australian site, where teachers were all non-Indigenous people. Everyone signed the ethics forms and were interested in how the methodology could be applied in their high school to benefit their students.

**Summary**

The peculiar qualitative case study research, design and process invites to a narrative description of the journey of the theorisation of CCoD as a methodology in collaboration with non-Indigenous teachers from Australia and Indigenous teachers from Mexico, in order to develop and refine the CCoD Conceptual Framework of the CCoD methodology. To understand the extents of the CCoD methodology explored by the case study research, a chronicle description of the enactment of the collaboration between Aboriginal students, teachers and researcher is needed. The next chapter examines the method and process designed for this research, which is called Biocultural Workshop.
CHAPTER FOUR. CCoD WORKSHOP, THE ENACTMENT OF COLLABORATION

The CCoD methodology is shaped by the positionality and onto-epistemology of the researcher (see Chapter 1) as well as the theoretical constructs outlined in the literature review (see Chapter 2). It is also informed by the Biocultural Workshop, see below. CCoD is studied through a case study methodology (see Chapter 3). The relationality between these three main components apprise and ground of the Conceptual Framework of the CCoD Methodology that is the significance of the research. This chapter outlines the journey of the fieldwork that was undertaken in Australia through the Biocultural Workshop. It is presented as a narrative from the viewpoint of the researcher involved in the collaboration between herself, IYW, and the teachers. It lays out the development of the Biocultural Workshop to reveal the findings of the research based on the summary of the reports. Furthermore, it unpacks the relationality, design and development, which formed the basis for the constructs of the CCoD methodology. The creation of the Biocultural Workshop, where collaboration is enacted, is a direct outcome of the research. This chapter is part of the phase two of the six chronological phases of data analysis called reflective analysis in data collection and explained in Chapter 3.
Relationality between Enactment, Analysis and Steps of Biocultural Workshop During the Fieldwork

This chapter answers the third sub research question: How could mutual learning and enhancement of reflective thinking skills be enacted during the CCoD methodology? It does so by providing evidence to support the findings of this research and to build the constructs of the CCoD.

This question can be answered by explaining the process of the fieldwork in relation to the Biocultural Workshop activities. Through this process, evidence of mutual learning and reflective thinking is presented. The researcher informed the high school through weekly reports of the progress achieved within each session. In this chapter, these reports are used to unpack the process through the documentation of actions, reflections and pictures of interactions and collaboration with participants that were used to inform the CCoD methodology and the enhancement of the Biocultural Workshop. It is here that we witness the potential of the CCoD Conceptual Framework and Methodology, premised on relationality, discovery, design and development. To support the findings of the CCoD methodology, the head of school allowed the reports generated prior to ethics approval to be used as data.
Step 1: Building relationships and trust through a mutual learning

Reports outlining the relationship building were a requirement from the head of school. These reports relate to the period of time (two terms) in which the researcher sat in on classes in order to develop trusting relationships with both the girls and the school leaders before the research could begin. As mentioned in Chapter 3, there were eight reports in the Building Relationships stage pre-ethics approval. After the Biocultural Workshop, the researcher had permission from the head of the school to use the pre-ethics reports as data for the thesis. In these reports, mutual learning, mutual understanding, trust, confidence, empathy, design practices and pride for cultural identity are unpacked. During the data analysis, building relationships became an essential step in the Biocultural Workshop and the CCoD. During this step, open communication was instigated by the researcher by sharing her own Mexican culture and by learning about the IYW’s culture as a means of building confidence and trust as well as keeping an open dialogue between all participants.

Through this relationship building process, intersection of Knowledges was enabled. I realised that it is essential to develop empathy and reciprocity when working towards projects of mutual benefit in Indigenous partnerships (Bartleet, Bennett, Marsh, Power, & Sunderland, 2014). It is also an important part of the pre-ethical guidelines to Indigenous Australian research (B. Martin et al., 2016) but not for NHMRC (2007) (For further details see Chapter 3 ethics process). These relationships encourage students to engage in deeply reflexive processes (Bartleet et al., 2014). These relationship building sessions helped us to develop strong relationships, reciprocity, reflexivity and an understanding of the representation of our realities.
In analysing these reports, there was not only involved mutual learning and understanding and exchanging of knowledges but the development of strong relations involving emotions while caring for each other, empathy and confidence while sharing our stories and culture and trust as there was consistency over the sessions. An important affective aspect of the research was the building of relationships. Considering the history of some previous failed projects at the school, the teachers and the Head of School believed and expected that for the project to be successful, it needed to have an element of relationship building incorporated into it. A focus on developing respectful relationships and clear expectations of the project, became and is now a significant part of the CCoD methodology. In the Building Relationships reports there were no pictures involved as the researcher did not have the Ethics approval. There were only written reports consisting of reflections of the classes by the researcher to inform the school the progress of the interactions and respectful relationship. Ethics approval to include images was granted in November 2017 after which the fieldwork commenced. This is discussed further below.

**Building relationships reports**

**Reflection Report 1.** The first day I met the students was challenging. During the class, they sat far away from me because they were not confident with a stranger in the classroom. We exchanged information and our names, and where we were from on a map of Australia and later, on a globe. At this point, it was important to expand the intention of building relationships as I was there to participate in the class with them.
Through the class activities, I realised that the participants already had artistic skills, were in contact with nature and were curious. The challenges and opportunities for the girls were to develop better skills in searching for ideas about fashion sketching. I realised how important it would be to tap into the students' passions during the possible Biocultural Workshop, as well as balance guidance and independence. Through the use of my design expertise, my role was to encourage the girls to develop and enhance their design skills and knowledge with passion rather than with a sense of obligation to complete the class goals.

**Reflection Report 2.** In this session, the teacher asked me to give a presentation about my professional life and the process of designing a product. I gave the class information about my career, my furniture designs and Indigenous projects that I have been a part of. I observed that the girls were very interested in my professional life and the furniture design process.

After this presentation, I perceived that the IYW were more comfortable with me in the class and that they were actively participating and conversing with me. In order to better understand their cultures, with permission of the teacher, I asked them to draw something about their culture. Almost all the girls drew the Aboriginal flag. Only one drew her dreaming. I acknowledged their connection to the Aboriginal community, but I asked them to draw something about their own Countrys. They did not seem to have understood me. I explain to them that where I come from, Mexico, there are many different communities, and all are unique and different. I showed them a bit about my background i.e. the diversity of Mexican communities. I notice that the girls were extremely curious and interested in my Mexican cultural heritage.
During this class the teacher showed them some diverse activities and books, as well as videos about fashion in Australia. It is essential to find balance between theory and practice for the participants, involving activities that explain or impart information and concepts about the topic of the session or the class, so they understand the process or action more comprehensively. This approach can make learning more tangible as it values the lived experience of the possibilities of design. This engagement has significance in the way communication is conducted, in how the researcher builds trust and relationships with the participants.

**Reflection Report 3.** The IYW were working on Aboriginal fashion sketches. In this class, the teacher set the aims for the class at the beginning, while explaining that they needed to finish the drawing of a dress design free style. Each student drew their own design interconnecting their artistic skills and their community’s art. The diversity of their cultures was evident during this session, while having the flexibility of drawing whatever they wanted during the process of working on their projects. I observed that the feeling of obligation to finish on time, can at times prevent them from enjoying the task at hand and developing creativity whilst completing the task.

In this session we opened communication by yarning about our lives. The students seemed to be more comfortable as they had begun to be more communicative with me during the class with a sense of freedom to express ourselves. The girls knew the art from their communities and with this class project, had an opportunity to be free with their creativity.
As the teacher explained the purpose of the project to them, I noticed they started to develop an awareness of the project in relation to their passions and art skills. I believe that it is important to know about Aboriginal teenagers’ interests and what they love, as this gives me an opportunity to understand them at a level that promotes empathy and creates personal connections. Their ideas pointed towards an interest in having their design printed onto clothing that would be presented as a fashion parade at the end of the term. The collaboration between communities or people from different backgrounds facilitated the process of reflection and sympathy.

**Reflection Report 4.** The teacher invited me to a session that was an excursion to an animal sanctuary. Some girls went to the animal sanctuary as part of the Caring for Country class, where they were learning about native animals, their diet, and how to take care of injured wildlife, so that, they may have the option of working in a sanctuary or as a ranger in the future. I realised during the visit, that due to their interest and enjoyment in this particular field of work, they participated without hesitation. Even though they enjoyed it, I believe they realised the possibilities of using these practices professionally in their future. The understanding and awareness of the possibility of utilising these skills and knowledges are crucial in CCoD. How it is possible to harness their knowledge, skills and experience in a different manner, encouraging innovation, creation, design, thinking and reflecting while acquiring confidence.

**Reflection Report 5.** In this session, the teacher showed them a video depicting a range of activities, such as videos of rangers, Aboriginal fashion, documentaries and discussions about culture. This approach gave the girls possibilities to decide what they might like to explore in their designs. These diverse topics supported the development of different skills
such as painting and understanding documentaries through experience. At this point in time, I realised that it would be important to be transparent with the aims, feelings and purpose of the Biocultural Workshop.

The girls have their individual Aboriginal knowledge embedded in their lives, as they are born in a community and are in touch and educated within their own culture and language. They each know their Indigenous knowledge however, most of them have not explored their knowledge while collaborating with non-Indigenous people and approaches. The school provides them with an opportunity to open their horizons, be innovate and collaborate with non-Indigenous people. It is crucial to develop responsibility and a sense of duty toward preserving and revitalising the knowledge with pride. This became one of the exciting premises of the CCoD methodology.

After five sessions and the activities previously mentioned, the girls were more comfortable, communicative and confident with my presence in the classroom. They would openly effortlessly approach and communicate with me, explaining and expressing their interests, knowledge and culture without my prompting. They were by this point of the process comfortable and eager to share their culture and time with me. This validates the vital importance of building deeper relationships as part of the Biocultural Workshop and the CCoD methodology.

**Reflection Report 6.** Over the previous sessions, I realised that the students were very interested about Mexican culture. With the teacher’s permission, I designed a presentation outlining the diversity of Mexican communities and presented it to the IYW during this session. The students took interest in the varying cultures and ways of life in Mexico and
through their questions, they clarified differences and drew connections between the cultures and communities presented to them and their own lived experience. Through this activity, they reflected and analysed on the possibility of developing their own resources and practices. They also empathised with others as they saw the similarities between their communities and other communities in the world. During this session and as a result of the presentation, it became apparent to me that they understood the uniqueness of Mexican communities and the pride and respect that I have for Mexican cultures as they were very respectful and interested about my background.

Their positivity and enthusiasm markedly increased when they were interested in something in particular. For instance, other cultures. My role in this session was to present aspects of different cultures in Mexico and to give ideas to open potential possibilities of using their own knowledge in their future career. With the permission of the teacher, I asked them if they would like to share a little bit of their communities with me which they agreed to do.

**Reflection Report 7.** In this session, some of the girls individually told me about their own communities while other girls presented to the entire class. During their presentations, I realised that even though the IYW are part of the collective Aboriginal community of Australia, their Countrys/communities are unique with many differences in language, environment, occupations, tools, types of art, dancing, sorry business, etc.

It was important to show the diversity in culture so that there could be the potential to realise the importance of their own culture, community, knowledge and practices. They not only liked learning about other plural ideas of cultures but expressed interest in
educating the class about their own cultures and practices within their own Countrys. Mutual learning and two-way learning were fundamental in the Building Relationships stage.

**Reflection Report 8.** The girls proudly presented their communities and culture to me. It is essential to develop empathy and reciprocity when working towards mutual benefit in Indigenous partnership (Bartleet et al., 2014), as well as mutual learning and understanding to develop empathy. These sessions helped us to develop strong relationships, reciprocity, reflection and representation of the students and researcher realities.

The girls developed the skills of thinking, reflecting, preparation and designing their presentations. They were confident while sharing and presenting their Countrys. Their presentations were clear, detailed and very interesting. I noticed the girls had more confidence in their work as they were proud to be sharing the uniqueness of their own communities.

The girls were open to sharing their knowledges with me as I was very respectful and interested about the uniqueness and similarities between their Countrys. Mutual learning between participants was demonstrated through the presentations. I came to understand their way of life and perspectives better than I had before the presentations. They were very appreciative of my interest in the uniqueness of their knowledges and how it is enacted in their everyday life. I noticed that they realised that something normal for them could be rich, new knowledge for another person. They shared their knowledges and reflected on the uniqueness and importance of their own culture.
The processes of relationship building, reciprocity and mutual learning encouraged students to engage in deeply reflexive processes (Bartleet et al., 2014). In analysing the reports, sharing Knowledge and culture was important from a student’s point of view. The participants found this step enriching as they negotiated the importance of sharing their cultures with other participants, as well as learning about other cultures. The participants realised the importance of their own culture and knowledge, and the differences between theirs and other cultures. This step became essential in the Biocultural Workshop as it provides the participants with evidence to understand the importance of the biocultural diversity and become aware of the significance of conserving Knowledge and practices.

Building relationships and trust in a mutual learning approach is Step 1 of the Bicultural Workshop. The participants come to know each other through a respectful and holistic mutual learning process via mutual learning and sharing, and exchanging Knowledges from their communities/Countries. This exchange of cultures occurred through various phases. First, the researcher introduced herself through a presentation of projects she has taken part in throughout her career centring around furniture design and Indigenous projects, as well as some values and visions in life that are of importance to her. Second, the researcher shared with the girls, through a presentation, information about ten different communities from her country of origin, Mexico. Described were the way of life of each community, their handicrafts, occupations and clothing. The girls were very interested and asked questions about the cultures, communities and people. In the following sessions, the girls gave presentations about their own community and showed the researcher and peers their way of life, totems, art, handicrafts, tools, occupations, food, landscape, and the location of their community. Through this activity, they came to realise the differences
and uniqueness of each Country and place, the diversity of Knowledges and environments, and the differences in their way of life as a result of their environment and resources.

**Step 2: Diagnosis of opportunities, interests and needs**

After two terms of building relationships and acquiring the Ethics approval, fieldwork began in November 2017. When the Biocultural Workshop began, there were nineteen IYW participating. During the process five of them ceased attending due to personal reasons. Two further students joined at the beginning of the second term resulting in a total of sixteen IYW completing the workshop. Throughout the process there were a total of three teachers participating, one of whom was present from Session 1 through to Session 15 with the other two joining the workshop at different times. The design part of the workshop totalled 34 hours, the reflective thinking activity 1.40 hours, and the exhibition 5 hours. Overall, the total hours included as fieldwork came to 40 hours and 40 minutes plus two terms pre-ethics approval spent on relationship building as a requirement of the school where the fieldwork was carried out.

As mentioned in Chapter 2, 'Diagnosis of opportunities, interests and needs' was the first step proposed as part of the fieldwork undertaken. Outlined below are the fifteen sessions that were conducted as part of the fieldwork and their related reports. Each report details the activities undertaken during the session, photographs as evidence, and a reflection report as evidence and analysis of the activities and possible steps to be incorporated into the Biocultural Workshop.
Session 1. Activities, 1.40 hours (see Figures 12 to 14)

1. The researcher showed the girls the presentation of the Biocultural Workshop
2. The teacher presented the differences between a product and a service. The girls gave examples to show understanding of the differences
3. Brainstorming of opportunities, interests, challenges, and preferences for harnessing their Indigenous Ecological Knowledge (IEK) to develop during the term 2 and 3. The girls noted diverse products and services that they had interest in.
4. We formed groups to work in during the Biocultural Workshop (A total of 5 groups each comprising of 4 to 6 girls)
5. The art teacher showed the girls new techniques to develop art for the Biocultural Workshop
6. Each girl showed the artwork developed during past classes that could be used as a basis for further work

Figure 12. Researcher presenting the Biocultural Workshop to the students
Reflection Report 1. As motioned before, it is important to set collaborative goals and to give accurate guidance, explanation and information of processes and concepts of the workshop. It is intended that the participants are able to understand the process and
complete the biocultural design outcomes on time guided by the steps of the workshop. It was imperative that collaboration and communication between the teachers and the researcher complement each, as to support the building and creation of a positive and collaborative team environment. There should be a harmonious relationship between the researcher and students, the researcher and teachers, and the researcher and school management in order to facilitate collaboration and completion of the project. The girls needed to comprehend the scope and requirements of the project in order to take full advantage of their Knowledge and talent.

To facilitate an increase in interest and commitment, it is essential to identify and understand the interests, needs, limits and preferences of the participants. To build the girls’ initiative, it is essential to involve them in experimenting with designs and should be encouraged throughout the process.

CCoD needs to be flexible in its practical application, as it needs to sit within the boundaries of school’s principals and mission/purpose, as well as the Australian Curriculum as followed by the school. The mission/purpose of the school guided the possibilities and scope of the project. In this case, as negotiated with the school, the workshop planned to develop an enterprise model by developing products and services encompassing Aboriginal knowledge and embracing love for Aboriginal culture.

**Step 3: Co-discovering**

In this step it is intended that the participants discuss, through a brainstorming activity, their interests, needs, and opportunities that they could harness during the project. The
participants were divided into groups according to their interests. The next session was related to Step 3 of the workshop, Co-discovering.

**Session 2.** Activities, 1.40 hours (see Figures 15 to 19)

1. 4 girls made masks utilising natural elements
2. 15 girls designed a PowerPoint presentation giving examples of their interests and projects for the Biocultural Workshop. (Some girls participated in both activities.)
3. They worked on the group concept as well as the materials and elements that would be needed to develop their projects. There were a further two sessions available to develop these aspects.

![Concept and elements of the project written by the researcher and teacher](image)

Figure 15. Concept and elements of the project written by the researcher and teacher
Figure 16. Sketching and planning art in pots

Figure 17. Exploring the use of natural resources
Figure 18. First experiments. Mask made with the use of natural elements

Figure 19. Sketching pots

**Reflection Report 2.** We explored innate skills, creativity and materials from nature while keeping a balance between guidance of the process and freedom of imagination while ensuring that the girls’ confidence was supported during the process. The experience of exploring natural materials and processes encouraged them to be curious and creative. As the girls were creative, it was easier to guide them to develop the projects.
At this point of the process, two limitations to the CCoD methodology had become evident. First, the power relations present between students and teachers due to the teachers having a responsibility to push the girls towards achieving desired outcomes. Second, personal issues arose some students over the duration of the project causing them to leave the school as well as the project early in order to return to their communities. As such, they were not able to finish the project.

At this stage, the girls were enhancing their decision-making skills enacted in their choices regarding their work in relation to the masks created from the use of natural elements. They were developing their creative skills while searching for ideas and the reflective skills while looking for materials and tools that they needed for the completion of their projects. I noticed that the girls were curious about the project and that they were working little by little with increased interest. A pleasant and respectful environment helped to advance communication and joy. Music helped to build this positive environment. The rainy weather affected the mood of the participants and overall class attendance.

**Step 4: Co-designing**

Co-designing is described as a step in which participants plan the design process, make sketches, search for materials and tools they need, and plan their biocultural projects. The next sessions were related to Step 4 of the workshop, Co-designing. Co-designing and Co-developing (materialisation of the projects) are iterative processes that can be seen as one step from teachers and students’ point of view (see more in the section enhancing biocultural workshop further in this chapter). It is important however for designers and researchers to separate these processes as they develop different skills and outcomes.
**Session 3. Activities, 1.40 hours (see Figure 20)**

1. The 16 girls worked in groups co-designing biocultural products and services.
2. They delivered a presentation outlining the concept of the group to support choosing materials needed for the project.
3. Each group’s concept was chosen in relation to and considering their product, service, language, region and interests.
4. One group of girls was working on the natural masks and tracing the lines of their artwork to later use in the Biocultural Workshop.

The girls decided on the products they would use to develop their concept and elements needed for their projects. At the beginning of the Biocultural Workshop, the girls planned to design soaps, lip balms, paintings, pots with Aboriginal art and Indigenous plants and flowers, colouring books (art teacher), educational resources (informative booklets of plants, animals, maps, food), furniture with Aboriginal art and fabrics.
Reflection Report 3. It was proposed that the participants be involved in the whole development of the Biocultural Workshop process as a means of increasing awareness of the design process, leading to the possibility of developing skills in co-design. The participants decided on projects before planning the logistics and choosing which tools and materials they would need. Having different people with diverse personalities, backgrounds and skills within the class contributes in a unique manner to the project, enhancing the exchange of practices and viewpoints. The range of cooperation and collaboration was demonstrated in the different levels of engagement by participants, depending on interests and stage of the process. For instance, some girls had skills in sketching, while others in planning and logistics. As a result, they took differing approaches to contributing to this session.
One of the limitations that I noticed, was that engagement did not occur with all participants at the same time. To begin with, only some of the girls engaged with the project as well as with myself, the researcher. The remaining girls joined in later. This can delay the overall process and project completion as time was needed for all the girls to become engaged. It was crucial to acknowledge and recognise individual personal qualities and to acknowledge the achievements and effort of each participant, so that they could acquire more confidence in the task at hand.

**Session 4. Activities, 1.40 hours - Co-designing**

1. There were only 7 girls present in the session. The others were absent due to an excursion/work experience.
2. The girls needed to complete the documentation and list of materials before they returned home for the holidays. The documentation and list were needed so that I could purchase all the necessary materials during their holiday break.

**Reflection Report 4.** There were only a few girls present during the fourth session of the fieldwork, which allowed me to become more personable while interacting with the participants. I could communicate with them on a more personal level and recognise their needs more acutely. Fewer people interacting at the same time promoted a deeper and more thorough understanding and sharing of Knowledges.

It was crucial that students saw the researcher as support, a facilitator and peer but not as a teacher. This breaking of power relations during the sessions encouraged more commitment with joy, rather than commitment as an obligation to finish set goals for each class. Collaborating and designing projects with them allowed this encouragement to
flourish. This is in line with the school’s interests and values and encourages class environment that was conducive to the presence of time to collaborate, develop and explore skills together. There was a harmonious and respectful relationship between participants during this session. Complaining or argument was absent with only a few challenges that helped us to acquire trust and self-confidence while overcoming obstacles together. For instance, one group of girls did not know which tool they needed for developing jewellery and we searched for the tool together.

The girls in the class were constructing a shopping list of the materials needed for next term’s project, and presentation. The girls were developing skills that are significant to the Australian Curriculum (Australian Curriculum, n.d.), such as ‘information and communication technology’ in which they developed the capability of generating ideas while searching for ideas to develop their projects through internet use, and during the planning stage of their projects, sharing and exchanging, selecting and using hardware and software to develop their presentations. In ‘critical and creative thinking learning’ there is a stage to identify and clarify information and ideas, organise and process information, imagine possibilities and connect ideas while considering alternatives, seeking solutions and putting ideas into action, transference of knowledge into new contexts, all of which were observed whilst the girls developed their projects.

Through ‘personal and social capability learning’ (Australian Curriculum, n.d.), they developed their skills in self-discipline so that they were able to finish their presentations and list of materials for the end of the term. I noticed that they were becoming more self-confident in what they wanted to do and adapting to the information and tools they were
encountering. They worked collaboratively and made decisions together formalising the list. Through negotiation, they also resolved disagreements that arose between them.

We were developing not only in our creativity but also in our ability to reflect while making connections between the sketches, ideas from the internet, the process of co-design, and planning the prototypes and projects. Teamwork and communication while negotiating through problem-solving should happen between students, teachers and the researcher in order to overcome challenges together and break power relations throughout the process. Diverse plans and options should be discussed and negotiated between all participants. Even though I tried to break power relations during the process, they continued to exist throughout the project between students and teachers.

In this research, I propose empowerment as a tool for breaking power relations and decolonizing the classroom and education as a whole. Cultural and self-empowerment aids in encouraging people to share power and knowledge while enabling others to flourish with willingness. Empowerment becomes a matter of solving specific issues that were perceived by the researcher as being related to individual limitations (Ertner et al., 2010). In the Biocultural Workshop the girls became empowered through sharing knowledge, enhancing their skills while acquiring experience designing their projects, they were harnessing opportunities that are embedded in their culture.

Empowerment is associated with the words emancipated as a motivation (Ertner et al., 2010; Freire, 1978). Therefore, through empowerment, people can change the imbalance of power relations and structures that are embedded in the society and education. The girls were relating their Aboriginal knowledge to their interests as a means of collaborating and
participating in the broader society. The Biocultural Workshop has the ability to enable non-Indigenous people to collaborate with Indigenous people by sharing culture in a respectful approach.

I was becoming more aware of the potential of this research and the CCoD methodology to focus on facilitating empowerment and providing IYW with the necessary opportunities needed to encourage motivation, decision making and self-determination. The research has the potential to change the historical context, positioning Indigenous peoples in an important role of being resilient in society though their IEK. Empowerment can be identified as a concrete and marked improvement in the living conditions of a specific demographic group, in this case, Aboriginal girls. Empowerment has also been described as helping a specific demographic who are perceived as being socially vulnerable and excluded from specific domains (Ertner et al., 2010). As mentioned in Chapter 2, IYW are seen as one of the most vulnerable groups in society.

**Session 5. Activities, 2.5 hours - Co-designing (see Figures 21 to 23)**

1. The teacher talked about the project and the aims for the following term, introducing the next work process. She also spoke about some concerns related to commitment and hard work as an obstacle in achieving the following term’s goals.
2. The researcher gave a presentation about the work carried out near the closure of the current term, and the work all the teams had been doing as well as the outcomes completed. The teacher identified two possibilities for next term. They could work on their own chosen projects or work on group projects relating to Country which would be chosen for the girls by the teacher and researcher.
3. The girls and the teacher made a surprise birthday PowerPoint presentation and cake for the researcher.
4. The girls worked on their concept for the team and a list of materials needed for their projects.

Figure 21. Researcher showing the outcomes of the term

Figure 22. Group picture of the girls with the researcher
Figure 23. Birthday surprise for the researcher. The strength of the relationship between participants developed through compassion and emotional engagement.

Relationships based on trust, empathy, compassion and care have the ability to thrive. This project involved not only professional but personal development. I observed that if there is a positive relationship between students, teacher and the researcher, all participants feel free to express their emotions and gain a sense of belonging. The girls and the teacher greeted me with a surprise birthday slideshow and cake and with hugs and words of gratitude. I perceive this action as a mark of the relationality and care held between the participants of the project. This action strengthened the relationship as empathy and a valuing of each other was displayed. I noticed that where there is trust and compassionate relationships there is also the presence of commitment and the growth of positive learning environments. After this event, the participants collaborated and cooperated with me in a deeper way. Through this action they showed me that they have care for me. They were not only happy working on the project but they were enjoying collaborating together with
me. Through their actions, I developed a sense of belonging within the group. This is relationality and is what CCoD Conceptual Framework is built from.

After this, most of the girls were curious while searching for the materials they needed for the project. They were learning and trying to choose the best ideas, materials and tools for their project. The girls were acquiring more self-confidence in the approach to their work. In this step of the project, the girls reflected on the design process and the importance of participating in the different steps of co-design, and thus bring conscious awareness to it.

In these first sessions, steps of diagnosis of opportunities, Co-discovering and Co-designing, I realised the significance of goal setting and giving accurate guidance, explanations and information regarding the process and concepts of the workshop to the participants, both the girls and the teacher. The imparting of this information supported the students in making conscious connections to the process of the workshop in order to achieve project completion. Each girl needed to realise the scope of the project in order to take advantage of their Knowledge and talent. On the other hand, collaboration and communication between participants was imperative to complementing each other’s Knowledge and skills, and achieving a positive and collaborative environment.

Communication occurred through various means such as yarning, giving presentations, painting, singing, designing, body language and occasionally through silence. These types of communication enabled the sharing of Knowledges and cultures. I realised that having flexibility in the modes of communication used, should be integral to CCoD and the intersection of Knowledges.
When co-discovering, it is essential to know and understand the interests, needs, limits and preferences of the participants (Ibinarriaga, 2014), which enables projects to develop with interest, commitment and engagement.

**Reflection Report 5.** An update and recap of the process was shown to the girls, to remind them of the process laid out in the Biocultural Workshop. The teacher and I explained to the IYW new concepts and talked about possible challenges and concerns such as project completion and the struggles involved in designing. Schedules and a deadline for the project were mentioned.

**Step 5: Co-developing**

The two steps, Co-design (project plan) and Co-develop (materialisation of the projects), were the most time consuming as the participants needed to experiment, acquire confidence within their practice and quality in their designs.

**Session 6.** Activities, 2 hours - Co-developing (see Figures 24 to 27)

1. This session initiated the fifth step: Co-developing. The teacher explained the benefits and importance of project completion and outlined the girls’ options according to their interests, necessities, opportunities and passions that were covered during the brainstorming session. The teacher also remarked on the importance of commitment to the project. This was due to the fact that two out of sixteen girls were not showing interest and commitment to the project.
2. As there were a few new girls in the new term. The researcher outlined the aims of the project again and the materials involved in co-developing and individually
developing the projects. The purpose of each varying project could be numerous such as a creation for sale, as a gift, for their own usage, or for their community.

3. Most of the girls worked in teams while a few worked individually as they had just been inducted into the project. The projects were based on their interests as mentioned above. There were six groups in total in this session.

4. The girls continued planning, designing, and exploring materials that would be used to create their varying projects such as pots, jewellery, frames, dreamcatchers and clap sticks.

Figure 24. Developing the first jewellery models and experimenting with natural elements
Figure 25. Drafting designs for pots

Figure 26. All participants working on projects
Figure 27. First jewellery prototypes using seeds

**Reflection Report 6.** In the co-develop step, it was important to set and explain the benefits and the importance of project completion, as well as set limitations and options to achieve the desired outcomes. Commitment and interest should be present to facilitate achieving the outcomes and it is important that the facilitator of the workshop foster both commitment and interest with relationality. To sustain interest and commitment for the project, the participants should have also their own goals for the project, instilling commitment within themselves. In this case, they needed to be aware of the materials needed to develop their projects and ideas, the concept of their project based on their culture, as well as the use and/or purpose of the project after completion. The goals are always related to participants’ interests and knowledge, as they are conscious of their own skills, reaches and limitations.
In groups, the girls planned, negotiated, designed and explored materials and began creating the first prototypes. To begin with, they were not confident in doing the projects as they were not used to the process nor the materials. Even though they felt unsure about possibility of achieving the desired outcome, they tried to do their best acquiring self and team-confidence. The girls present during this session explored and tested their ideas, creativity and knowledge of the materials supplied, making prototypes to improve the quality of the project in the next sessions.

The girls had already demonstrated many skills such as artistic skills embedded in their education and practices in their communities that in some cases helped them to develop the projects more quickly and easily. These Knowledges and skills were advantageous and could be harnessed when collaborating together.

In these sessions, I learnt about Aboriginal culture. The girls taught me about their culture, practices, processes, symbols, and types of art in relation to each of their communities. There was an increased willingness on the girls’ part, to share their culture with me. Mutual learning, two-way learning and sharing Knowledges were present during the session. Discussing ideas, thoughts, techniques, and sharing culture led the girls to become more confident with me and vice versa, as we were coming to know each other. They wanted to show me their cultures and exchange ideas. They asked me questions and expressed their doubts about the project with me. Communication and knowledge sharing were flowing and increased through diverse ways of communication as mentioned earlier. I supported every step of the workshop. I shared my past project experiences in Mexico with the girls while remaining open to learning new processes and practices to develop the projects.
Including the girls in the whole Biocultural Workshop process was helping them to overcome diverse incidents, issues and difficulties, as well as harnessing their Knowledge, skills and opportunities. The difficulties that arose did so while enhancing the quality of the products as the girls sometimes became frustrated with unexpected outcomes. At times, some decisions that were made were not the best possible decisions in relation to the product and the girls became upset. The girls were very adaptable and resilient to the challenges, occurrences and variants in the project.

At this point, I realised that the Biocultural Workshop needed a significant investment in time, at least six to seven days in total, in order for the tangible outcomes with real and positive benefits for all parties, such as enhancing skills, decision-making, etc. to achieve the desired quality. This timeframe is based on past experience in workshops conducted in Mexico and by analysing the girls’ progress during the project.

The girls felt more comfortable whilst listening to music but worked less on their projects due to distracting themselves by watching the videos projected on the whiteboard. There should be a balance between creating a harmonious and comfortable work environment with a feeling of commitment to the projects.

**Session 7. Activities, 3 hours - Co-developing (see Figures 28 to 33)**

1. The teacher, with the girls, reflected on the process of the past classes and the next step in in the process of co-developing.
2. The researcher explained various processes to the groups in order to develop their products. She also supported students during the process and learnt about Dreamtime and the meaning of Aboriginal symbols.

3. The three teachers explained and showed the sixteen girls different possibilities and techniques they could implore in the creation of their projects.

Figure 28. Waterproofing pots to avoid deterioration of paint to be applied to the exterior

Figure 29. Background painting of a pot after waterproofing
Figure 30. Working on pots

Figure 31. Working on dreamcatchers
Reflection Report 7. Through presentations and talks, the teachers, the researcher and some students explained and showed the possibilities and techniques to create the products according to our understandings and experiences.
The five groups in this session were spread throughout different classrooms, as each project had differing needs. Location and space were essential to developing the activities. It is important to use a space that is conducive to co-developing/building/creating the projects. For instance, the spaces used were the art room, a quiet space to think and design, the laboratory to experiment, the classroom for presenting on the projector and outdoors, to look for natural materials and dry the projects. It was challenging for me at the beginning of this session, as I needed to move throughout the different classrooms in order to follow up on the girls’ progress. As a result, I was not able to adequately follow up with each one of the girls. To accommodate the limitations in support, I only worked with the girls on some of the activities and processes. I noticed that in this session, the girls seemed very interested in experimenting and developing the projects, as they worked diligently throughout the session and collaborated with their peers, teachers and myself. In general, the atmosphere during this session was collaborative, positive, harmonious and active, with the exception of two girls who were not showing much commitment.

Most of the girls were working hard and performing extraordinarily in the projects with only two out of the sixteen girls not wanting to participate in the project in any way at all. They did not say why they were not interested. I did notice however, that they were the two girls who had only just joined the project that term. All teams were advancing satisfactory with differing needs and questions that were answered whilst progressing and experimenting. Throughout this step, it was clear that the girls had more self-confidence and are not scared to ‘mess up’ (read students statements below), as they are willing to freely experiment.
This session brought with it a key shift in the girls’ attitude that clearly illustrated that CCoD was in motion. Some of the girls were carrying their work on their projects into their lives outside the classroom. Some thought about picking shells by the beach in their free time, others painting and drawing for their projects in their spare time. I noticed that they were enjoying the process of putting their ideas into action and watching their ideas materialise. They were committing themselves to their projects beyond their obligation within the classroom setting. This work outside of designated class time highlighted how the project as a whole was becoming an interest in their greater lives and not just something they did at school during class time or something that was to be completed out of a sense of obligation.

One challenge I perceived in this session was that some girls lacked patience. If they could not achieve something on the first try or they needed to make a major effort to amend something, they simply quit and moved onto attempting another project. It was important to encourage them to overcome perceived problems, be patient and to develop critical thinking as well as implementing strategies to ensure their project’s completion. The outcomes and processes became critical and important in CCoD. Patience was a key element towards project completion.

Some of the girls’ statements showed evidence that overcoming challenges were important to acquire self-confidence and learn about patience. Resilience and flexibility were important abilities during the process of co-design. Time, consistency and not giving up were key elements in reaching project completion with worthy outcomes.

*Student 1:* ‘In products, I messed up, so I had to start again’.
Student 2: ‘I messed up my first design but I’ve got to finish’

Student 3: ‘The negative part was it didn’t come out the way I planned it to be. The positive part was the pot painting came out awesome’

Student 4: ‘I’ve learnt that you can’t rush, some things take time’.

Student 5: ‘In decision making I learnt on how to collaborate on ideas. Learning how to fix mistakes. In products, that we have a theme of culture in all’.

We shared more Knowledge by co-designing and co-developing, whilst in ‘building relationships’ we shared by telling stories and yarning during the classes. The girls realised the importance of applying differing processes and finishes to the products to acquire a better-quality result. For instance, the team working on pots did the waterproof painting inside the pots to avoid deterioration due to filtration of water through the terracotta that could damage the art on the outside. They also painted the base layer of the pot black and started to design their art in white over the top of the black. They were aiming to start their painting on the design during the next class.

At the beginning of the session, the girls painted the outside of the pot in black. Afterwards, they realised that they should paint a bit more of the top and inside of the pot resulting in a better-quality finished product. The process of making gradual improvements as they became more and more autonomous in their decision making and actions was critical to the Biocultural Workshop and became a foundation of the CCoD. Another example of this occurred when the team working on the dreamcatchers finished the first dreamcatcher with material provided by the researcher. They then started producing a new one with natural materials that they had picked up from the land. The girls and I went to find branches to do the base of the dreamcatcher. To begin with, they
tried to do the circular bases with dry branches that cracked and caused their project to be ruined. They soon realised that young, green branches could adapt better to the shape and could be dried in the once worked into the desired position. In this case, the girls were actively problem-solving with creativity, while acquiring knowledge and learning from nature through experimenting and thus developing expertise. The girls were exploring and analysing each step within the process. Through a naturally flowing process of critical thinking, the girls were developing cognitive skills or strategies that increased the probability of a desirable outcome for their projects.

**Session 8.** Activities, 3 hours - Co-developing (see Figures 34 to 36)

1. Only one student attended this class as the other fifteen were participating in other activities.
2. The girl advanced on her pot and began another design project.
3. The girl taught the researcher through storytelling and drawings different symbols from her Aboriginal culture.

![Figure 34. A student working on her pot design](image-url)
Reflection Report 8. Only one girl attended the session because the others were participating in another school activity. There was a risk to project achievement and outcomes because the time was very limited, and many classes were cancelled. In this session, the researcher and the student had the opportunity to share knowledge in a deeper
manner through yarning about what she wanted to do after school – namely, become a midwife and artist) and sharing photos of my family. The student also taught me about her Country through storytelling and drawings different symbols from the art in her Country. I shared with her some of the symbols from the Huicholes people in Mexico and a bit of my culture through pictures of where I used to live. The student had the opportunity to finish two biocultural projects and had all the attention of the teacher as well as myself. The art teacher made some art to show different styles to the girls in the next session.

Having fewer people in the session facilitates dedication, commitment and mutual learning, the relationship became stronger as attention and sharing were personalised, the process of teaching and learning was simpler and flowed. It was relaxed and the three participants had time to work, learn, teach, relax, concentrate and yarn.

The student was very cooperative and sharing with the researcher and vice versa. She displayed skills, values and Indigenous knowledges that are an integrated part of her artwork and achievements. The innate skills of sharing and explanation could be seen to flow effortlessly. These skills are integral to CCoD. She had a curiosity in the diverse types of new techniques demonstrated as part of her project, while experimenting with different products and styles and due to this, a combining of her creativity and her knowledge arose. It was essential to have a place and time to experiment a mix of methods, acquire self-confidence and sharing knowledge. I realised that the girls need to develop their self-confidence and pride in their culture to share their knowledge. This can occur while enhancing pride in their cultural identity.
The school’s timetable was very tight, so the sessions were moved and some cancelled. Negotiation and communication between the teachers, students, staff and researcher to finish the project was fluent and friendly at all times, which became part of the foundation of CCoD and was reflected in the positive atmosphere during the sessions.

**Session 9. Activities, 3.5 hours - Co-developing (see Figures 37 to 42)**

1. The session was longer from 9 am to 2:20 pm. 3.5 hours of work in total without breaks.
2. The teacher set up deadlines for the project with the girls. The girls understood and established the timelines to finish their work.
3. The girls worked on their projects and they advanced in a remarkable manner.

![Figure 37. Girls and teacher working on their designs](image)
Figure 38. Pot progress

Figure 39. Girls painting their design on pots
Figure 40. Experimenting and exploring new techniques

Figure 41. Teacher supporting the students
Figure 42. The progress of a frame design

**Reflection Report 9.** During the Co-developing step, which can be collaborative or individual materialisation, guidance and setting of deadlines were crucial to achieve project completion. The capacity to communicate positively and constructively as well as negotiate effectively between participants involved, were key elements in maintaining a positive environment and achieving goals and mutual benefits.

In this session, the girls worked on their projects and advanced remarkably. In the following sessions, I worked on particular products with two different teams (the pot and jewellery teams) but I designed at the same table with the girls. As the girls saw me working with them, they were more committed, and they acquired more confidence in designing and working with me. They were interested in my projects and more focussed on their own individual products. The relationship was stronger at this point of the project.
The atmosphere during this session was relaxed with fourteen of the sixteen girls totally confident with me in the classroom, even the shy ones. They asked me questions, they asked for support. They also explained their projects to me including the meaning behind them and the progress done. Little by little, with respectful communication while hearing about their projects and learning about patience for quality in the projects, the relationships were stronger, and the intersection of knowledges was fluent acquiring consciousness and pride in our own cultures. The girls were curious and interested to apply their own knowledge from their communities on the projects, they were searching and remembering their own culture to use in the products. The girls were using their Indigenous knowledge, imagination, creativity, as well as natural skills. The difference between Indigenous knowledge and natural skills is that Indigenous knowledge is learnt through generations and form their own community, and natural skill is an ability that you are born with.

Imagination enhanced this session. The girls were looking at different designs, techniques and methods, and materials to further the creation of their projects, sometimes mixing techniques with creativity. In this session, the teams dissolved and became one single group/community working towards the same goal, co-designing biocultural products based on Indigenous Knowledges. The feeling of collaboration was different. Even the girls who were working on their own projects shared Knowledge, processes, materials, advice, designs and ideas with everyone else. The intersection of Knowledges was natural and accepted by everyone. It was implicit without the necessity of words which is the importance of respectful communication and supporting each other during the process. There was no need to explain it. I simply happened organically.
They were developing skills in self-reflection regarding the importance of their Culture, the quality of the finished products, and their strengths and limitations within the project. They enhanced their designs and projects session by session as well as their skills, experience and the quality of their end products. Music helped to develop a positive environment and boosted concentration and creativity while they enjoyed the development of the project. They also collaborated with the researcher and the teachers, as to affirm that Biocultural Workshop can facilitate a positive collaboration between Indigenous and non-Indigenous people.

The girls were motivated to finish their projects on time, conscious of the fact that the end of term was the deadline for product completion. After having been reminded of the deadline, most of them were very interested and committed to finishing their projects with a higher standard of quality and on time. This way of thinking and its associated actions are testament to that of a person who is committed to their goal due to self-determination and self-management. The participation of the girls in the whole process was crucial to gain this level of confidence, empowerment and self-determination.

**Session 10. Activities, 3.5 hours - Co-developing (see Figures 43 to 48)**

1. The sixteen girls were co-developing their projects in the art classroom with three teachers also participating.
2. The girls wrote a list of the materials they need for the following sessions.
Figure 43. Working in the art classroom on pot designs

Figure 44. Painting detail onto projects
Figure 45. Dreamcatcher table in work mode

Figure 46. Researcher co-designing with the girls with music and videos on the background
Figure 47. Detail of a frame design

Figure 48. Student concentrating
**Reflection Report 10.** The girls managed their time and needs. They made a list of the materials they needed to finish the projects. It was essential that they looked at the requirements needed to finish their designs and consider the availability of materials in order to manage their use of materials. Self-confidence and freedom were important components in attaining goals.

The girls had gained confidence and were open with me. They asked me for support, advice, materials or just showed me their projects in order to gain feedback. We shared culture, Knowledge and experience as well as values and care for each other. As a result of this, the relationship grew to acquire trust. During this session, a positive atmosphere built on confidence and freedom to explore was felt. The girls present were advancing in their designs and some finished their first or second projects.

During this session I observed diverse, strong personalities and characteristics, as each girl had a diverse way in which to approach opportunities, challenges, art, creativity, imagination, styles, Knowledge, practices, methods and the uses of the tools. At the beginning of the project, I was overwhelmed feeling a need to constantly observe and facilitate, dropping in on each classroom. By session 10, I was more relaxed because all the participants were in the same classroom, I knew the dynamics of the session, I could participate more throughout the session, and I could observe with more detail each action and the girls timing and process.

With three teachers in the class, collaborating together was crucial as they were experts in different fields of study and had varying knowledge and skills that could support the girls in their diverse approaches. The teachers and students alike were very committed to the
project. The teachers were in the process of developing products as well and the environment was more relaxed as all involved were working toward the same goal with a defined purpose. We were all facing opportunities and challenges while sharing knowledge. The main skill being developed during in this session were empathy, mutual learning and support of one another.

The participants sang, danced a little bit and released their negative energy when challenges and problems occurred. These were positive ways to relieve and free ourselves of tension when needed, a means moving forward without giving up. A pause in working can make all the difference between giving up and reaching project completion. For instance, one girl was working on her tile. She painted something that she did not like in the end (a turtle) leading her to become upset and frustrated so she simply stood up and left the class. When she returned, I played her favourite song. We sang, she danced, and then returned to her project again.

The girls were engaged in their projects. They wanted to reach completion and begin another new project. It could be seen that they were developing pride in their work. This project was a bridge between Knowledges, Cultures and respectful collaboration between Indigenous and non-Indigenous people which is a premise of CCoD.
Session 11. Activities, 3.5 hours - Co-developing (see Figures 49 to 54)

1. The girls kept developing their projects in a positive manner and amusement.

Figure 49. Progress while working on pot design

Figure 50. Materials and tools for jewellery making
Figure 51. Art teacher explaining different techniques to a student

Figure 52. Materials and progression of design sticks
Figure 53. Designing jewellery

Figure 54. Resources and materials used in the production of dreamcatchers
Reflection Report 11. There was a hardworking and enthusiastic atmosphere in the art room, as the girls were only a few sessions away from finishing the project. Even though the girls rushed to finish on time, the environment was positive and respectful. The girls had gained trust in me by this point. This acceptance was important for me and I noticed that it held and equal importance to them as well. Trust was crucial in our intersection of knowledges. Throughout the span of the project, I observed that the more trust there is between participants, the more confidence there is to share of oneself within the group. The stronger the trust, the greater freedom there is in sharing knowledges and achieving collaboration.

The girls advanced in their projects enjoying the experience with a positive attitude. The teachers and the researcher took on the roles of developers and co-designers, as they were involved in the development of their own projects as well. This motivated the girls in that we were involved the same activity, facing the same process and challenges.

The girls were creatively mixing their Aboriginal knowledges and practices with techniques learned in class, personal interests, research designs and ideas they came across from the internet. The curiosity to try different materials, other projects, colours and techniques, helped the girls to freely explore their hidden passions, skills and interests. The time to explore and enhance little by little, was crucial for acquiring confidence and self-trust.

Music helped to create a positive environment conducive to stimulating their productivity. I believe that music was a useful tool in relaxing the participants and facilitating fluid collaboration between all involved. It became another means of communication. We
shared our taste in music and they showed me Aboriginal musicians (Baker Boy, Jessica Mauboy, Geoffrey Gurrumul, David Hudson). We released stress through singing and a bit of dancing when challenges and problems came up.

The girls started to ask what was going to happen with the projects, which was an interesting turn of events as it showed that real, they were developing a sense of pride in the projects they were doing. Some girls wanted to keep them, and some wanted to sell them. I talked with the teachers and we arranged to sell the projects during the exhibition at the end of the term. The girls were reaching the goal of project completion that was crucial to gain empowerment and self-determination as part of the workshop.

CCoD process facilitates to discover limitations and understand them, as well as identifying challenges to overcome, and opportunities to harness. Self-reflection-acceptance-trust was happening in this session. The girls looked at their designs and tried to improve them or improve on time in their next project. Time is needed to experiment, understand, reflect and improve.

Some girls had personal problems and dropped the project or could not continue to attend, so they missed the sessions which had an impact on their outcomes. Despite agreeing to the project in the initial negotiation, it is impossible to predict life events, illness, sorry business, and so on, events which caused some participants to cease participating. I noticed that this can be a limitation for CCoD, as it is something unpredictable but does not affect the methodology itself. (see limitations of the CCoD in Chapter 5)
Session 12. Activities, 3.5 hours - Co-developing (see Figures 55 to 59)

1. The girls co-developing and finishing their projects.

Figure 55. Team dreamcatchers with the researcher

Figure 56. Earrings adorned with Aboriginal art
Figure 57. Adding final touches to music sticks

Figure 58. Two of the girls showing her achievement with pride
Reflection Report 12. The girls were co-developing and finishing their projects. They asked me for advice during this session for support. Sometimes, the girls needed a companion to feel a sense of encouragement or to get support in finishing their project.

Fourteen girls were involved in the project this session, even some of the students that had shown no interest in taking part before. They improved in many ways such as collaborating together, sharing their knowledges as well as sharing their experiences. The creativity was getting better as they were mixing techniques and their Indigenous knowledges. They were curious to keep experimenting. The girls were very committed, and they were loving their outcomes.
Session 13. Activities, 3.5 hours - Co-developing (see Figures 60 to 83)

1. The last session of the workshop, most of the girls finished more than one project. They worked hard to complete their task with outstanding outcomes.

Figure 60. Process of pot using mixed techniques

Figure 61. Finishing a necklace with her totem
Figure 62. Finishing projects - sticks and earrings

Figure 63. Feather and seed earrings
Figure 64. Earrings finished with Aboriginal art

Figure 65. Finished earrings

Figure 66. Star earrings
Figure 67. Aboriginal pot - waterholes and people

Figure 68. Pots with endemic plants

Figure 69. Small pot with Aboriginal art
Figure 70. Dreamcatchers

Figure 71. Aboriginal painting pot
Figure 72. Pots with Aboriginal art

Figure 73. Flowerpot painted by one teacher

Figure 74. Pots using new techniques
Figure 75. Wave and waterhole necklaces

Figure 76. Seed necklaces
Figure 77. Seed plant necklace

Figure 78. Frame painting
Figure 79. Aboriginal Clap sticks

Figure 80. Tiles with aboriginal art

Figure 81. Tiles with Aboriginal symbols
Reflection Report 13. This was the last session developing the projects. The teachers and I were supporting the girls during this final class in order to complete the projects. Having
teachers from diverse professional backgrounds (Social science, arts and cultural studies) encouraged differing points of view apt for problem-solving and support.

I took on the role of facilitator, supporter, developer, designer and advisor during the session. I supported and advised the girls about the appropriate use of materials, knowledge and techniques.

The atmosphere in the room was full of positive energy, with much sharing, hard work, music and commitment. The girls had full trust in the teachers and myself. The relationships and bonds between all participants were exceptional. During the project, there were only problems associated with logistics, time, some minor misunderstandings and challenges, but overall, void of problematic relationships between participants. Strong bonds and relationships had been built between all involved and as a result, the necessary connections based in trust and confidence were in place to make achieving project completion possible. This is a major outcome inherent in the CCoD methodology.

Most of the girls were proud of their work and outcomes, asking if they could display their projects in their dormitories, take them back to their communities or sell them, as mentioned earlier.

Some girls were not present during this session, and as such other girls offered to finish their incomplete projects that needed varnishing or fixing. The ability and virtue of cooperation and collaboration were outstanding. The girls were displaying more self-confidence in that they expressed an interest in doing more projects next year, similar to the one they were in the process of completing, and to continue working with diverse
products. When overcoming failure, it is important to keep trying different strategies and techniques, to take time to decide what to do without overthinking the decision. Some key aspects towards achieving self-determination included overcoming fears, insecurity and failure during the process, as well as negotiating decision making and problem-solving. These aspects played a role in the Biocultural Workshop.

The present connection between Indigenous and non-Indigenous participants spanned enacting practices in design, art, Aboriginal knowledges, music, techniques, practices, friendship, empathy and trust, confidence, collaboration, creativity, interest, commitment and respectful verbal or non-verbal communication during the project. Most of the girls finished their projects and liked the collaborative and collective nature of the project as is also present in Indigenous knowledges and is the ontological basis of this research.

**Step 6: Presentation of biocultural projects**

**Session 14.** Activities, 5 hours (see Figure 84)

1. Exhibition and sale of the projects in the school during the cultural day.
Reflection Report 14. The projects were exhibited and sold during the cultural day at the school. The girls showed their designs to their families, peers, friends and those invited. The exhibition was the culmination of the project where the girls were able to witness the results of their hard work and the outcomes reflected in the exhibition. Through this, they discovered that they can gain remuneration for their hard work and Indigenous knowledges.

They acquired the skill of project completion and learnt how to sell their projects by observing the teacher and I trading while explaining the meaning and process of the making of the projects. Some of the girls had the opportunity to explain their own projects to the buyers and interact with them. The girls realised and learnt that they can reach their goals even through the challenges, harnessing their talent and Aboriginal knowledge with tangible and real benefits, both professionally and personally.
Approximately 75% of the projects were sold. The girls were happy and excited to receive acknowledgement and income for their hard work and designs. The sense of project completion and capital remuneration enabled self-confidence and self-esteem to build within the students, which has the possibility of leading to self-empowerment and self-determination in their near futures. The Biocultural Workshop supported the girls in developing their designs to their full potential.

**Step 7: Self and co-reflective thinking**

Step 7 provides participants with a platform within which they are given the opportunity to recall, relive and consider their feelings, creativity, needs, challenges, struggles, opportunities and achievements. Even though the reflection activity was conducted after the exhibition stage, it is advisable to do this step with all participants involved. Only fourteen participants were in this activity. It can be adjusted and made flexible in order to fit within the school timetable.

**Session 15. Activities, 1.40 hours**

1. The researcher presented the whole project to the girls through the use of a PowerPoint presentation. (see Appendix - website link)
2. The IYW took part in a reflective thinking activity to better understand the project as an integral process towards empowerment and cognisance.

**Reflection Report 15.** The presentation of the project was used as a co-reflective activity making the whole process rational. By imploring critical thinking, the participants have a self and co-reflective moment where they can either write about the whole process or talk
about it in focus groups. It is strongly recommended that they have the flexibility and freedom to express their thoughts as this is essential in ensuring that all participants take part in this process.

Freedom and flexibility in communication were essential and possible due to the girls having grown in their confidence with me. The fourteen girls in this session decided to participate in this reflective activity through a variety of mediums. These included writing their reflections with their preference not to talk in front of the other girls while others engaged in a focus group where they talked about the project and explained feelings, process, as well as further co-design work in their communities. This activity was treated respectfully, and all participants enjoyed the closing activity. Through their answers, I noticed that they understood the importance of each step within the Biocultural Workshop and the knowledge and skills they acquired through the process. The girls were very keen to develop the project in their communities. Student: ‘I really love making dream things and... I really love it. I was so happy to make them so now I can make them anywhere even when I go back to my community and show other people and with my brothers and sisters. I really learned lots out of it’.

The girls developed critical and reflective thinking through considering the whole process from beginning to end. One girl stated that she really felt encouraged by mutually learning about different cultures in the world. They become more conscious of the importance and uniqueness of their own culture, practices and community. Pride in their Knowledges and practices when sharing with me and other girls increased. Reflective thinking is essential for consciousness, empowerment and self-determination and to further build deeper relationality. One of the students stated that she learnt ‘to show another way to your
culture and how every culture is different’. Other student said, ‘I learn a lot from the girl (researcher) and learning about them (Mexican Indigenous peoples)’. Australian teacher I also stated that ‘Through mutual learning the students realised that each culture is unique and has regional elements. They identify their place and their diversity.’

The link and connections between participants and organisations participating in this research, as well as the schools and university, could lead the way to further research as well as working together in a deeper and holistic way. For this Aboriginal school, the element of relationality is a core value. CCoD supports, facilitates and enhances this value not only with external individuals and organisations but internally within the school’s individuals, both students and/or staff members. For instance, the teachers have their own individual classrooms. However, when there is an opportunity to collaborate and support other teachers and students, they embraced it. The Biocultural Workshop allowed this to occur.

Roles of the Participants

Role of the researcher

In the Biocultural Workshop, the researcher played different roles as reflected in the diverse work necessary in the research of this study. These roles included facilitating the process, introducing concepts, collaborating with participants, working with the concepts, and facilitating progression to the next step of the process. At the end of the project, a reflective thinking activity of the whole process was conducted. This was essential in furthering an understanding of how the project unfolded. Namely the process of working
together and understanding the process and achievements from a new perspective that informed the CCoD and enhancement of the Biocultural Workshop. The Biocultural Workshop not only changed the students and teachers’ perspectives but the researcher’s as well.

At the beginning of the investigation the researcher’s role was that of a negotiator, observer, learner, classroom support, manager and coordinator. During the workshop, the role of the researcher evolved to include researcher/designer, facilitator, apprentice, documenter, guide, advisor, co-designer, co-developer, listener, presenter, peer and problem solver. By completion of the project, the researcher had taken-on the additional roles of trader/seller of the projects during the exhibition.

Role of the students

In analysing the data, it was found that there are several roles that students, teachers and researchers perform during the process of the methodology. These are listed below.

The roles that the students experienced through the process were very different at each stage of the CCoD. They played different roles and discovered functions that they felt more confident with. Through taking on these different roles, they developed proficiency in wider areas depending on their personality, natural skills, experience and interests.

At the beginning of the investigation the IYW were observers, students and presenters. During the workshop their roles evolved to become co-designers, apprentices, teachers,
peers, planners, coordinators, co-developers, problem solvers, support for others and creatives. At the end of the process, the students had become critical thinkers and artists.

**Biocultural Workshop, Origin and Enhancement**

To experience CCoD in action, the researcher developed a method, namely the Biocultural Workshop, which is implored as a method of the CCoD methodology to enact and test its reaches, accomplish its outcomes of the theory, and to facilitate the collaboration between Indigenous and non-Indigenous people. To develop the Biocultural Workshop, the researcher used a Co-design workshop for environmental conservation (Ibinarriaga, 2014) that was used to work with Indigenous communities in Mexico in 2014. During the research process, I realised the limitations of this method (Ibinarriaga, 2014) in conducting this research. Through the process, I enhanced and redesigned the workshop to make it a more respectful process and to better facilitate collaboration, outcomes, interactions, communication and partnership between participants. In this chapter, I show the enactment of the Biocultural Workshop with steps and descriptions of activities with the inclusion of reflections and outcomes in order to understand the progress of each stage. Thus, following this process, researchers and designers can collaboratively enact a Biocultural Workshop. Due to the emerging importance of each step, possible outcomes and challenges will be noted as reflections at each step. Each of these steps is proposed as essential in the CCoD methodology which aims empower Indigenous Young Women’s onto-epistemologies and IEK.
Origins of the Biocultural Workshop

As mentioned in Chapter 2, The Biocultural Workshop proposed for the CCoD methodology is informed by the Co-design workshop for environmental conservation (Ibinariaga, 2014) that was used to work with Indigenous communities in Mexico in 2014. It was further experienced and improved with the analysis of students and teachers’ viewpoints.

The Biocultural Workshop considers the opportunities and challenges from the girls’ Countrys and within the Indigenous school environment, along with the available natural resources in the boarding school context to mediate their IEK in partnership with the researcher’s knowledge. This educational and cultural context of the students meant that the proposed products and services designed could be more appropriately negotiated to respect the girls’ Indigenous knowledge. The strength of the Biocultural Workshop may reside in both processes and outcomes that are culturally informed. This chapter includes photos of the process and the biocultural products and services. The photos also illustrate the process of the workshop, some interactions between participants and the outcomes. The pictures are to serve in complementing the narrative and the activities conducted within the sessions. The most suitable choice of group size, according to Ibinariaga (2014), 4 to 7 participants in order to achieve better outcomes as a result of paying more attention to each participant.

While this earlier research used a Co-design workshop, there were some limitations during its application. These included target participants (Indigenous people and university and masters’ students), community action-based location (on Country), products and services
for environmental conservation but not biocultural diversity conservation. This current research enhanced the workshop adding some stages that would improve the process leading to better interactions, relationality and outcomes, and successful collaboration meaning respectful and harmonious partnership with mutual benefits and outcomes. This enhancement was identified through the analysis of the data collected and the intersecting points of view of Indigenous participants, teachers and the researcher as discussed below.

**Enhancing Biocultural Workshop**

This Biocultural Workshop was improved through considering the different points of view of participants while IYW, researcher and teachers gave their insights to improve the process and the possible reaches of the Biocultural Workshop encouraging mutual understanding and benefits for all parties involved. For this investigation, case study research methodology used diverse methods such as observation, reports and interviews in order to develop the CCoD. The Biocultural Workshop is a method proposed as part of the CCoD for the enactment of the collaboration. From the researcher’s point of view, there are seven steps in the Biocultural Workshop (see Figure 85) building relationship and trust through a mutual learning, diagnosis of opportunities, interests and needs, co-discovering, co-designing, co-developing, presentation of sustainable projects and self and co-reflective thinking step (see Chapter 5).
Figure 85. Critical Co-Design Workshop for designers/researchers
The following tables describe the complex process of the fifth chronological phase of the data analysis and triangulation of information between participants (IYW, researcher and teachers). This analytical phase in the case study research was designed to enhance the Biocultural Workshop as part of the CCoD methodological process.

Table 5 shows the steps of the Biocultural Workshop with the main elements and skills developed during the Biocultural Workshop according to the researcher. The data was analysed in an open coding manner, deducting reasoning and analysis of observations and reports.

**Researcher’s articulation of the concepts, language and process of the Biocultural Workshop**

Table 5. Researcher point of view of the Biocultural Workshop in correlation with skills developed

<table>
<thead>
<tr>
<th>STEP OF BIOCULTURAL WORKSHOP</th>
<th>RESEARCHER</th>
</tr>
</thead>
</table>
| **STEP 1. RELATIONSHIP BUILDING THROUGH MUTUAL LEARNING** | • A crucial step to developing communication, trust, and getting to know each other with respect through the process of mutual learning  
• Pride for Cultural identity by realising the uniqueness of each culture  
• Guidance with freedom of expression/holistic approach  
• Emotions and trust  
• Empathy  
• Respect |
<table>
<thead>
<tr>
<th><strong>STEP 2.</strong></th>
<th><strong>STEP 3. CO-DISCOVER</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DIAGNOSIS OF OPPORTUNITIES, INTERESTS AND NEEDS</strong></td>
<td><strong>Discovering, developing and enhancing skills</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Creativity</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Reflective thinking</strong></td>
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<tr>
<td></td>
<td><strong>Mutual learning</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Flexibility in communication</strong></td>
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<tr>
<td></td>
<td><strong>Holistic and flexible process</strong></td>
</tr>
<tr>
<td></td>
<td><strong>A dynamic way of discovering skills</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Empowerment</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Challenges</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Positive environment in a suitable location</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Flexibility in communication</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Holistic and flexible process</strong></td>
</tr>
<tr>
<td></td>
<td><strong>A dynamic way of discovering skills</strong></td>
</tr>
</tbody>
</table>
- The possibilities to use skills and knowledge are an important and crucial part in CCoD methodology,

**STEP 4. CO-DESIGN**
- Discovering, developing and enhancing skills
- Creativity
- Empowerment
- Challenges
- Limitations of each participant
- Positive environment in a suitable location
- Flexibility in action
- Holistic and flexible process
- A dynamic way of discovering skills
- Watching videos and listening to music while working on projects
- A balance between supporting and designing
- Inclusivity

**STEP 5. CO-DEVELOPING**
- Discovering, developing and enhance skills
- Creativity
- Empowerment
- Emotions
- Opportunities
- Challenges
- Limitations of the projects and each participant
- Positive environment in the right place
- Mutual learning
- Flexibility in action
- Holistic and flexible process
- A dynamic way of discovering skills
- Sense of community
- Watching videos and listening to music while working on projects ensuring the girls feel comfortable.
  - Creating and ensuring a positive environment
- A balance between supporting and developing – working independently within the same space as the girls to encourage commitment
- Idea development and generation

| STEP 6. PRESENTATION OF BIOCULTURAL PROJECTS | • Empowerment  
• Self-confidence, self-esteem, empowerment |
|---------------------------------------------|---------------------------------------------|

| STEP 7. SELF AND CO-REFLECTIVE THINKING ACTIVITY | • Self-determination  
• Reflective thinking  
• Challenges  
• Mutual learning  
• Flexibility in communication and expression – written: form filling, letter writing, verbally  
• Through CCoD methodology, the girls can discover and realise the importance of their own skills, abilities, capacities and limitations.  
• Connection of ideas |
|-------------------------------------------------|-------------------------------------------------|
Students’ articulation of the concepts, language and process of Biocultural Workshop

Through evidence from the data collection and stimulated recall with Indigenous students, I found that IWY students learnt through four main stages in the CCoD process: sharing knowledge and culture, starting the project and co-discovery, co-designing and co-developing, and project completion. Thus, students understanding of the Biocultural Workshop was in four main steps in relation to the skills developed through the process (see Table 6).

Table 6. Students point of view of the Biocultural Workshop in correlation to dispositions experienced and skills developed (Stimulated recall activity data)

<table>
<thead>
<tr>
<th>STEPS OF CCoD ACCORDING TO STUDENTS</th>
<th>STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEP 1. SHARE KNOWLEDGE AND CULTURE</td>
<td>• Sharing culture and knowledge with other students and the researcher</td>
</tr>
<tr>
<td></td>
<td>• Learning different Knowledge</td>
</tr>
<tr>
<td></td>
<td>• Self and mutual learning</td>
</tr>
<tr>
<td></td>
<td>• Communication</td>
</tr>
<tr>
<td>STEP 2. STARTING OF THE PROJECT-CO-DISCOVER</td>
<td>• Bored and do not know what or how to do the project</td>
</tr>
<tr>
<td></td>
<td>• Negotiation with others</td>
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<tr>
<td></td>
<td>• Problem-solving skill development</td>
</tr>
<tr>
<td></td>
<td>• Overcoming fears and problems in a positive way</td>
</tr>
</tbody>
</table>
### OVERCOME CHALLENGES / NEGATIVE FEELINGS
- Do not know how to start
- Feeling nervous, bored, afraid, do not know what to do, forget things
- Challenge to overcome fears, negative feelings and ups and downs

### STEP 3. CO-DESIGN AND CO-DEVELOP
- Exploring and experimenting
- Creativity
- Being original with their own Knowledge from their communities
- Problem-solving skill development
- Decision making
- Resilience and flexibility
- Time, experience and patience
- Redo products and projects
- Confidence when trying again
- Improve and develop skills
- Discover what I like
- Do not give up
- Freedom to express myself and culture

### STEP 4. PROJECT COMPLETION
- Fun and enjoyment
- Project completion
- Pride in my culture
- Happiness
- Share my culture

The first step from the students’ point of view involved the sharing of knowledges and cultures. The participants found this step to be an enriching process as they came to
understand the importance of the uniqueness of their culture through sharing with other participants as well as learning about other cultures. This step is essential in CCoD as participants understand the importance of the biocultural diversity and make them aware of the importance of conserving their knowledge and practices.

The second step involved starting the project and co-discovery. As mentioned in the evidence and analysis of the fieldwork, the beginning of the project was challenging for the participants as they felt lost, nervous and afraid when considering the aims and were unsure about how to begin the projects. The primary challenge of this step was how to overcome this lack of confidence and fear of the unknown.

The third step focused on co-designing and co-developing. In this step the participants acquired self-confidence and self-reliance through experimentation. They also acquired skills and patience enabling them to improve their projects. In this process, according to an evidence base, the participants were empowered and became confident through experiencing problem-solving, decision making, and evolving in their use of new techniques when redoing the design projects. The persistence of the students to not give up through the process was supported by the researcher. During this step, the participants understood and became aware their strengths and limitations. They also learnt about different knowledges through sharing their own cultures with other participants, collaborating in teams or as a group, developing resilience, respecting workspaces, acquiring patience, and understanding how to show originality through access to their own knowledge and culture.
The fourth step is project completion. This step is crucial in ensuring that the participants to feel pride in themselves and open up opportunities for future learning. One student referred to feeling ‘happy’ at this point of the process. Another student referred to being ‘proud of my (her) culture’ through sharing the uniqueness of her culture.

Teachers’ articulation of the concepts, language and process of Biocultural Workshop

Teachers gave a different version of the steps during the Biocultural Workshop, with only five steps identified. The first step being building relationship in a mutual learning way. The second step includes diagnosis of opportunities, interests and needs. The third step involves co-discovery, co-design, co-developing. The fourth step is project completion. The fifth and final step is a self and co-reflective thinking activity (see Table 7).

Table 7. Teachers’ point of view of CCoD in correlation to dispositions experienced and skills developed

<table>
<thead>
<tr>
<th>STEP OF CCoD</th>
<th>TEACHERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEP 1. BUILDING RELATIONSHIP IN A MUTUAL LEARNING WAY</td>
<td>• Crucial to developing communication, trust, and knowing each &lt;br&gt; • Respectful for all parties &lt;br&gt; • Build connections between similarities and differences of cultures &lt;br&gt; • Understanding the importance of cultural identity and the uniqueness of each culture &lt;br&gt; • Experience other cultures, similarities and differences</td>
</tr>
<tr>
<td>STEP 2. DIAGNOSIS OF OPPORTUNITIES, INTERESTS AND NEEDS</td>
<td></td>
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<tr>
<td>--------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>- Make connections</td>
<td></td>
</tr>
<tr>
<td>- Mutual learning</td>
<td></td>
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<tr>
<td>- Creativity</td>
<td></td>
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<tr>
<td>- Resources determined the work</td>
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<tr>
<td>- Share ideas</td>
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<tr>
<td>- Work collaborative</td>
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<table>
<thead>
<tr>
<th>STEP 3. CO-DISCOVER, CO-DESIGN, CO-DEVELOPING</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Discovering, developing and enhancing skills</td>
</tr>
<tr>
<td>- Understanding the importance of the cultural identity and the uniqueness of each culture</td>
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<tr>
<td>- Similarities and differences between cultures</td>
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<tr>
<td>- Communication</td>
</tr>
<tr>
<td>- Critical thinking and reasoning</td>
</tr>
<tr>
<td>- Exploring ideas and concepts</td>
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<tr>
<td>- Resilience when design approaches change</td>
</tr>
<tr>
<td>- Creativity with diverse resources</td>
</tr>
<tr>
<td>- Utilising elements and products differently</td>
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<tr>
<td>- Resilience, deal with change</td>
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<tr>
<td>- Fostering creativity and collaboration</td>
</tr>
<tr>
<td>- Time management</td>
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<tr>
<td>- The project needs a guide to go step by step</td>
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<tr>
<td>- Iterative process</td>
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<tr>
<td>- Developing problem-solving</td>
</tr>
<tr>
<td>- Encouragement to take risks without a lot of responsibility</td>
</tr>
<tr>
<td>- Inclusive (age, race, gender)</td>
</tr>
<tr>
<td>- Positive environment</td>
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STEP 4. PROJECT COMPLETION

- Discover possibilities and methods of presentation
- Importance of the sustainability of the projects (recycling, upcycling, second-hand products)
- Time management
- The sense of achievement, finishing a project from start to end
- Becoming more determined

STEP 5. SELF AND CO-REFLECTIVE THINKING ACTIVITY

- More self-confidence in using own cultural identity
- Critical thinking and reasoning
- Empowerment
- Self-determination
- Personal and professional skills development

A teacher from Australia stated:

‘It’s been great to have a project that goes from start to finish, for a lot of them. So, they’ve done a project, they’ve made a connexion with the person and that person has remained with them until the project was completed. It’s not a case of, they are gone, and they need to finish the project. It’s someone that’s been there all the way along, and now the connexion with the school is great’. (Australian Teacher 1)

This statement supports the success of the project completion and the virtuous relationship between the participants and the researcher.
Summary

The students and teachers were in support of the Biocultural Workshop whilst the researcher articulated the CCoD methodology. The Biocultural Workshop was enacted through the collaboration between Indigenous students, teachers and researcher. This foregrounded the development of the CCoD methodology though interactions between participants and negotiations with the school. The Biocultural Workshop was informed and enhanced by diverse theoretical approaches found in the literature, by following school requirements, evidence from the fieldwork and the workshop at the school. This chapter outlines the design, purpose and enactment of the Biocultural Workshop, showing evidence that informs the CCoD methodology.

The Biocultural Workshop is proposed to contain seven steps for researchers/designers, by explaining four steps to the IYW, according to Indigenous students’ perspectives. The roles of the teachers, researcher and students were dynamic, changing throughout the process and the enactment of the Biocultural Workshop. For example, while the researchers' role was as a facilitator in step 1, it shifts to that of a peer and co-developer in Step 6. The IYW begin as learners in Step 2 and by Step 6 become co-participants, co-developers and peers. The narrative with reflections from the researcher detailed in this chapter, helped to shape and develop an easeful communication with the participants when explaining and applying the Biocultural Workshop. The reflections recorded in this chapter also assist in explaining the detailed workshop for future CCoD researchers/designers.
Through the narrative and reflection of the Biocultural Workshop, I found three main benefits within the Critical Co-Design methodology (CCoD). Firstly, the possibility of collaboration between Indigenous and non-Indigenous peoples and organisations to occur in a respectful, holistic and productive way with real and tangible outcomes. Second, the enhancement and development of diverse skills in each step of the Biocultural Workshop. Third, the expression and development of pride for Aboriginal culture and practices through mutual learning and two-way learning. The multiple and interchanging roles reveal a continual relationality which further supports the platform of the CCoD Conceptual Framework, which is built on Indigenous research paradigms and decolonizing methodologies.

This chapter described and visually demonstrated the activities within each step and session to highlight the collaboration between participants throughout the fieldwork. The descriptions of the workshop also reveal the diverse roles of the participants during the design processes that focused on relationality and Place. The next chapter identifies and analyses five themes that emerged from the fieldwork in Australia and Mexico as well as the Biocultural Workshop in Australia to provide the basis for the CCoD theory and tenets.
CHAPTER FIVE. CRITICAL CO-DESIGN METHODOLOGY: INTERWEAVING THE COMPLEXITIES

This chapter explores the themes that emerged during the analysis of the Biocultural Workshop, the interviews with the teachers in Australia and Mexico. Furthermore, at the end of the chapter the construct of CCoD methodology is revealed. In the previous chapters, I provided an ontological framing of the study and a conceptual framework, I analysed the literature, and reported the findings from the Biocultural Workshop conducted in Australia and the interviews conducted in both Australia and Mexico (see appendix) which are used and mixed throughout this chapter as they are relational to each other. This chapter illuminates and examines the onto-epistemological premise of CCoD methodology as it emerged in the research and presents Fourteen Axiological Tenets that can underpin the CCoD Methodology and Conceptual Framework. From this research, five themes have emerged, which will be presented and discussed. The themes are:

1. Collaborative resilience enacted through space, time, flexibility and relationality
2. A respectful intersection of knowledge construction
3. The human agency that includes cultural identity, relationships and intelligent emotion management
4. The outcomes for the participants
5. The limitations of CCoD methodology

As outlined in Chapter 3, the methodology involves an ongoing reflective analysis within six analytical phases. First is a reflective and critical analysis of the literature review.
Second is a reflective iterative analysis during data collection. The third phase involves an in-depth thematic analysis through open coding with deductive and inductive analysis. The fourth phase focuses on finding negative evidence. The triangulation of information between participants is the fifth phase. The last phase identifies the conceptual and theoretical coherence of the development of the CCoD methodology. In this chapter, I reflect on the process of the third, fourth and fifth of these analytical phases by discussing, analysing and interweaving the data of the students and teachers voices in the stimulated recall in Australia and teachers’ interviews in Australia and Mexico, thus unpacking the themes with evidence, theory and researcher analysis. The themes were informed by the literature review and the analysis of the observation and recording patterns in the participants’ (students, teachers, researcher) responses, actions and reflections. The following themes emerged from a correspondence of the data. Subsequently, understanding the interconnectedness of the findings and patterns in the responses (Miles & Huberman, 1984) were used to inform the theorisation of the CCoD methodology.

Each theme described below includes participants’ voices, points of view and reflections of Indigenous students, teachers and staff of the institutions, related literature and theories, and descriptions of the findings. The researcher disentangled the muddle of data collected (observations, reflections, reports, stimulated recall focus group, interviews) and analysed it, to give insights to the CCoD construct and Fourteen Axiological Tenets. The themes give significance to the new knowledge, becoming some of the tenets of the CCoD methodology, shaping its onto-epistemology while valuing all kinds of knowing, being, doing and becoming, privileging Indigenous culture, knowledge and peoples (Martin & Mirraboopa, 2003). It is here that we see the research come together holistically. The
quotes written throughout this chapter are from the stimulated recall activity with the students in Australia and the interviews with the teachers in Australia and Mexico.

**Themes**

The five themes identified throughout this case study research are presented in this chapter through providing a theoretical framing, some overall observations and some illustrative data.

**1. Collaborative Resilience - Space, Time, Flexibility and Relationality**

Collaborative resilience is derived from the analysis of the partnership between the researcher and Indigenous students in Place. In Place relates to the space, Country and time chosen to collaborate for the CCoD. The components of space, time, flexibility and relationality of people and Place are the first four elements that are required for CCoD to promote collaboration in Indigenous settings in this research. Without these fundamentals, CCoD cannot happen.

This research partnership is contributing to a more nuanced understanding of resilience through relationality within Indigenous onto-epistemologies and contexts, while collaborating with non-Indigenous people towards biocultural conservation and regeneration. Resilience is defined as ‘a set of behaviours over time that reflect the interactions between individuals and their environments, in particular the opportunities for personal growth that are available and accessible.’ For CCoD, resilience indicates complexity in reciprocal people–environment–knowledge interactions within Place.
Drolet et al. (2015, p. 436) supports this, stating that ‘This understanding of resilience goes beyond an individual notion, to a more relational and holistic approach’, resilience with relationality is a premise in CCoD as an approach of decolonization.

The elements of flexibility and relationality of people and place are emphasised through the journey. Participants expressed and reflected on this matter, and even when participants did not talk about space and time in the interviews and workshop, it is inherent and fundamental to allow collaboration.

This theme is called collaborative resilience, as all these elements - space, time, flexibility and relationality (Place) - are inextricably interconnected, and all participants need to agree and negotiate these factors to make the project happen. Based on the reflections of the workshop in Chapter 4, it is imperative to work on individual and collaborative adaptability and communication to strengthen the resilience of the collaboration and partnership.

**Third space – dialogic space and physical space**

The third space subtheme is identified by the researcher observations and analysis of the evident physical collaboration between participants. For this finding, I use the term third space by Bhabha (1990) that is associated with the space where the processes of cultural hybridity between individuals and communities and multiculturality within broader society gives rise to something new and different. There are new knowledges, new meanings and new representations and designs within Indigenous and non-Indigenous partnerships. During this research process it has become clear that coming together to
understand differences and commonalities between cultures enables an awareness of the uniqueness of one’s own culture, and the necessity of reciprocal understanding and mutual exchange of knowledges.

The physical and dialogic dimensions of space are important in this study. The physical space is a place to apply the CCoD methodology as well as a dialogic space as a place to talk, yarn, discuss, share, negotiate, exchange knowledges, explore, experiment, think and reflect. In between the spaces there is possible hybridisation of knowledge creating new knowledge together. For this purpose, in this subtheme, I use the terms place and space interchangeably. This ‘third space’ provides the possibility for the intersection of knowledges through the processes of intercultural contact. For CCoD, hybridisation relates to the respectful negotiations of new knowledge developed through the process of working with the biocultural projects which the participants developed individually or in groups. On the other hand, intersection is when participants share their culture and knowledge, understanding the diversity without acquiring others’ knowledge or culture. Intersection of knowledges can lead to hybridisation of knowledge.

The physical space is place-based learning, in this case it is a school environment which acknowledges and respects its place within Aboriginal Country (Wurundjeri people and land, part of the Kulin nations). It is essential that the activities are held close to a natural environment even within school settings, where Indigenous peoples can recognise the resources of the land and the place, as most Indigenous peoples can see the importance of their knowledges and biocultural value of their Country. Smallacombe et al. (2006) claim that while Indigenous knowledge traditions share many values and spirituality, they do differ from place to place and are localised, relating people to their place in their
community and their Country. For CCoD, the connection of people and place are essential in order to reinforce cultural identity, recognising local virtues/values and harnessing opportunities from the place. This is the platform or place that the CCoD Conceptual Framework creates and acts as a finding of this research journey.

In the contact zone, the type of environment is fundamental to the project development. In this case, the girls were more comfortable when in contact with natural resources (leaves, sticks, seeds) and artistic expression, or through building friendship, sharing, singing, chatting, helping and supporting each other.

In this research, the groups were spread across different classrooms on some occasions, as each team had different needs. The place/space was essential to developing the activities, there needed to be a suitable space to co-develop the projects for each need. For instance, the art room was a quiet space to think, reflect and design. The laboratory a place to experiment and the outdoors a place to look for inspiration, resources and connect with one’s own spirituality and connection to the environment. For this research, the dialogic space is essential to building relationships, to sharing and having reflective cycles, as well as to overcome challenges, negotiate, enjoy and break paradigms, and to co-design solutions and opportunities (Adams & Faulkhead, 2012; Genuis et al., 2015; Godinho, Woolley, Webb, & Winkel, 2015).

While collaborating with Indigenous peoples, some episodes of distress (frustration, negative feelings, anger, etc. as outlined in Chapter 4) can occasionally occur in the dialogic space during contact time, and that can be seen as negative discomfort and harmful to participants (NHMRC, 2007). Somerville and Perkins (2003, p. 253) argue that
this ‘… ‘discomfort’ zone of cultural contact is usefully conceived as an area of productive tension in which differences can generate hybrid outcomes’. This research supports the above philosophy empirically, while in CCoD the discomfort zone is a crucial aspect where most of the participants overcome tensions, limitations, fears, negative feelings, frustrations and challenge themselves. The moment of distress in the contact zone is very important for the research and methodology, as it helps the participants to acquire experiences and skills to understand, reflect, critique and improve their resilience, problem solving and decision making while having support and collaboration over the process. The student participants acquired experiences and skills such as creativity, imagination, problem-solving, negotiation, patience, decision making and resilience in this discomfort zone (for more information based on data collected see the section Stories informing intangible outcomes below).

Negotiation - Time and flexibility

For this research, the participants negotiated the collaboration in the cultural interface within the Aboriginal school while enacting both ideas of time, Indigenous and western. Within an Indigenous ontological perspective, the concept of time is not linear (Meyer, 2003) as it is framed in the western academic tradition (Hoffman, 2013). For Indigenous peoples, the past and the future co-exist with the present (Martin & Mirraboopa, 2003) in time and space. Indigenous peoples wait until the moment is in their favour by observing living and non-living elements, following the seasons, connecting to the past, present and future, and trusting their intuition for this to happen, with patience. This is something that western society has lost (or might have never had) in the past decades, with the advent of
globalisation and capitalism, and the way the world has started to be seen as an expendable resource, a means to richness and power.

It is within the realm of the sacred and spiritual that individuals are gifted and able to access the past and the future through ceremonies, dreams and visions (Hoffman, 2013). Indigenous students and teachers have shown me a different point of view about time. For instance, the teachers showed me timing while setting deadlines among the classes and school environment (western construct of time) while IYW taught me that timing comes with patience and hard work. Student 7 stated ‘you can’t rush, some things take time.’ (Indigenous construct of time). Time is about finding the right moment and place, working collaboratively and waiting until it is reached. The importance is in enjoying the present moment while moving towards the aims, because reaching the aims can take time.

In negotiating time and flexibility of different ontologies in the research, there are many possible opportunities, as well as limitations to take into consideration, when collaborating with a school or organisation. These negotiations need to have mutual benefits within Place (Graham, 2006). There are different moments in CCoD within the elements of time and flexibility to be negotiated during the span of the research. First, negotiations with the school, teachers and students. Second, building relationships that happen throughout the CCoD enactment and journey. Third, overcoming challenges. Fourth, experimenting while still maintaining the quality of the project and acquiring confidence and understanding of timing, along with commitment. Fifth, flexibility and freedom of expression and lastly, project completion. Throughout the span of the research, the elements of time and flexibility are present and are inextricably interconnected to other steps.
The flexibility and skills to negotiate how CCoD could fit in the educational program were essential. The researcher needed to be open to changes and also needed to be patient with the responses of the school, people involved and Ethics committee. The researcher also needed to be committed during the Biocultural Workshop, while being flexible with timings even when deadlines for the completion were approaching.

The methodology requires the researcher to be flexible with the school schedule, and the specific class and the space. As the place and time of the Biocultural Workshop developed within the school program, the researcher should fit in and be flexible to participate according to the agreement about mutual benefits as discussed in Chapter 3. In this research, the logistics and timetable of the projects were agreed between the teachers and the researcher, according to the time and space to keep the ‘Caring for Country’ class involved. Limitations and difficulties can happen if one party does not agree or is not comfortable with the process, if there is lack of trust or integrity in the project. In this research, all participants were understanding and flexible in order to make the project happen.

Flexibility is needed to accommodate different personalities and forms of expression, as well as to respectfully reflect on the project from the participant and the researcher’s perspective. Flexibility in communication and expression during the project was paramount through the art, design, writing, verbal and physical experiences to resilience in the project. As the student quoted above stated, ‘some things take time’. Resilience is about recognising the necessity of patience and trust in the creative process to be completed.
The core of the CCoD methodology needs to have a timeline and deadline structure if the products are to be produced, and the desired outcomes attained within the project’s timeframe. Rather than seeing time structure as a limitation, it is a challenge, and part of the skill building process. The skills in time management (western domain) that the participants acquire through the CCoD process while having a deadline, are skills they can apply in other aspects of their lives while collaborating with non-Indigenous people.

**Relationality**

The *Pre-ethical Guidelines and Principles to the Indigenous Australian Research* claim that relationality - Indigenous peoples and Entities - should be the most important component in research (B. Martin et al., 2016). CCoD acknowledges the importance of collaborating in Place and considering Indigenous worldviews. Even if the project is off-Country for the participants, their Indigenous onto-epistemologies should always be respected, acknowledge and privileged. As discussed in Chapter 2, Indigenous peoples believe that the core of life is Country, which means relationality between people and place (Holmes & Jampijinpa, 2013), a space where all entities are inextricably interconnected. According to Wilson (2008) to have a healthy environment for Indigenous peoples it needs to include the elements of a good relationship between people and community, environment and land, cosmos and sense of spirituality, and in relation with the ideas. The complexities in relationality with a boarding school are discussed in the last chapter as the project was held off-Country for all participants. A teacher reflected on the importance of the connection between people and place to build an integral development in education. *Mexican Teacher 2 – ‘... there is a triangulation between students’*
Indigenous knowledge that are part of their culture, what the teacher can contribute and the resources of the place. It is an integral development. Connection people and place.’

During the Biocultural Workshop (see Chapter 4), the researcher observed how Indigenous participants discovered and addressed different opportunities, challenges and environmental problems within Indigenous land by privileging the important constructs of relationality they have with Country, to understand better their ways of knowing and doing through co-designing biocultural projects. For instance, student 2 stated:

‘Creating and using all sorts of different things, something like leaves and raw sticks was pretty easy. But by making dream-catches using leaves, sticks and feathers was so hard for me. But at least I finished it all and at the end realizing that everything was pretty easy by choosing the right decisions.’

In most cases, traditional education has often proved ineffective because the model does not include the community or the connection and relationality between people and land in their design, therefore, they do not provide the opportunity to recognise what are the real needs and interests of Indigenous peoples (Freire, 1970; Tuhiwai Smith, 2012). CCoD methodology proposes to decolonize education through collaboration with respect, mutual learning-understanding, relationality, responsibility, safety, and compassion for each other.
2. Respectful Intersection of Knowledge Construction

The intersection of ways of knowing includes the diversity of Indigenous and non-Indigenous knowledges and forms the second theme. To ensure a successful intersection of knowledges there is a need for respectful and virtuous relationships between Indigenous and non-Indigenous people. This can be achieved through diverse ways of communication, mutual understanding and learning while sharing knowledges, empathy and the appreciation of the importance of biocultural diversity and spirituality.

For me, as a researcher, the intersection of knowledges was not only through the Biocultural Workshop, but through the whole process of conceptualising the methodology. As an international student, working off-Country with Aboriginal Australians, I needed to do some research about the different cultures, knowledges, backgrounds and the current social and political situation, and find the gaps that separate Indigenous philosophy from the western one in Australia (Huggins, 1998; Tuhiwai Smith, 2012). As a Mexican Indigenous mestiza, an outsider of the Australian society, and having experienced working and collaborating with Mexican Indigenous peoples, my point of view was very clear in noticing these gaps and differences that separate Indigenous and non-Indigenous peoples in both Australia and Mexico.

This intersection of knowledges occurs throughout the whole project, helped by the fact that participants are in a boarding school off-Country, and CCoD offers a safe and respectful space where they can share knowledge about different systems and explore possible hybridisation through co-design. For example, two students stated in the stimulated recall that they learnt how to share their knowledge through CCoD: ‘I learnt
how to share knowledge... learnt to just going.’ (Student 4), another student stated, ‘I learn to share my culture by drawing on the frame and the pot.’ (Student 9). The intersection of knowledges enables building respectful and trustworthy relationships, and developing a connection by sharing stories and experiences while building empathy. Furthermore, it helps with understanding similarities and differences between the diversity of cultures by enhancing a mutual understanding and connectedness amongst the participants. Likewise, it enables the appreciation of one’s own and other’s culture, giving importance to the biocultural diversity. Student 8 pointed out that it ‘Was great to share knowledge and about my Country’ and she learnt ‘how to be original sharing original thoughts but having ownership’. Two students stated that they enjoyed showing elements of their culture in the products they co-designed, one statement of this: ‘My favourite moment of the project was drawing on the frame my culture, where I come from’. (Student 9)

The element of respectful intersection of knowledges is important as it was bound to develop, grow and improve throughout the project. Cross-cultural sharing is essential for this element because it can assist in avoiding misunderstandings and miscommunication between peoples from diverse cultures and knowledges. Indigenous and non-Indigenous people have been dealing with misunderstandings and miscommunication for a long time, since the advent of colonisation, placing IEK under threat by forcing Indigenous people to live and adapt to a modern lifestyle dominated by western beliefs (Tuhiwai Smith, 2012). Different cultures have different rules, language and protocols to consider while collaborating and working together. I observed that if the participants understood other cultures and points of view, they were more respectful and empathic to each other. Even though being respectful at all times is crucial, there are limitations to the understanding of other cultures, knowledges and perspectives. While trying to solve this problematic
situation, in general, Indigenous and non-Indigenous politics and academics have been setting different protocols and methodologies trying to work and research respectfully together, such as the National Statement on Ethical Conduct in Human Research (NHMRC, 2007). The Indigenous Design Charter, developed by Kennedy et al. (2018), facilitates accurate and respectful research, collaboration and representation of Indigenous peoples, knowledge and practices expanding to other fields and international settings. Despite that, generally, there is still a lack of understanding, communication and empathy occurring.

CCoD methodology offers a different approach of collaboration between Indigenous and non-Indigenous people by applying different methods, based on being flexible and versatile, taking into consideration the different cultures and personalities involved. CCoD introduces the importance of communication and of a genuine interest in the each other’s culture, making all parties feel free and confident to express their own knowledge and feelings while experimenting with their own creativity and skills in a holistic way.

This section is written as a narrative experience from the point of view of the researcher about the respectful intersection of knowledges with the partnership institution in Australia, before (see outline of process in Chapter 3) and during the Biocultural Workshop (see each step of the process and session in Chapter 4). This narrative is supported by interweaving evidence from students and teachers’ voices. To support the findings of the CCoD methodology, the head of school allowed the reports generated prior to ethics approval to be used as data.
As discussed in Chapter 3, in the Australian site, the first experience of intersection of knowledges happened when I had meetings with the head of school, teachers and my supervisor. These meetings were essential to syntonise and understand the needs, interests and expectations of the principal and the school values. This dialogue marked the beginning of an agreement about the proposed mutual benefits that this collaboration could bring to the school, the students and the research. We negotiated goals and mutual benefits as part of a respectful interaction, this was a crucial moment in the process of deciding whether or not to collaborate together. These negotiations were carried out in a polite, respectful and straight manner. The goals were reachable in order for the research to be reliable and ethical. It is important to be transparent with the aims and purpose of the project as well as following the feelings and learning to read body language and intuition. These readings are important within Indigenous cultures. The understandings of protocols such as respect of place and people, laws, elders, culture (ways of being, knowing and doing), community, families and the future (way of becoming) comes from a culturally common knowledge and cosmology (K. Martin, 2008). Uncle Bob Anderson, Ngugi Elder, stated in 1998 that people need to ‘Be polite and courteous, to be unselfish in what you do and have and to be helpful’. Being respectful, comfortable and honest with open communication in the meeting process was a key moment to allow the research to happen.

The head of school asked what the girls and teachers would be doing in the project. I agreed with the principal’s request to spend some time with the school community before the research began as part of a sensitive and respectful approach and part of the Aboriginal pre-ethics requirements in research (B. Martin et al., 2016). The purpose of this time in the school was to give the teachers and principal time to get to know me and the potential
of the project further before committing the students to the project. After the head of school agreed to further building the relationship, the staff responsible for the program development joined the meeting to plan the collaboration and the logistics, and to design the project according to the availability within the school program as mentioned in detail in Chapter 3. In one meeting, we established the value of the relationship between the school and the researcher and the principal agreed to the participation of the school to the research (see agreement in Chapter 3). We then discussed the importance of being respectful and conscious of following Aboriginal values and the goals of the school throughout the process, this respectful interaction was a condition of pre-ethics approval, in order to receive the letter of support from the head of school to the Ethics. At this stage, it was crucial for the researcher to fully understand the values, the vision, the program, and the culture of the school (Worawa Aboriginal College, n.d.; Worawa College, 2016) in order to follow respectful interactions and intersection of knowledges.

As mentioned in the reports in Chapter 4, during the first sessions the girls did not want to sit close to me or talk to me as they did not know me, but with time we built confidence and trust through spending time together, yarning and sharing culture. We would do things together like doing presentations, art, yarning, storytelling, and other educational activities while exchanging cultural knowledge, sharing our visions and talking about our goals. It was challenging at times, but inspiring and enjoyable. We reached a level of trust to the point that the girls arrived first to the class to sit beside me to share and explain to me their projects for the ‘Caring for Country’ class.

Presenting the story of my life and career to the girls, talking about my studies, my company ‘Hidden Desire’ in Mexico, the furniture-sculpture I designed, and how and why
I changed my pathway from industrial to social designer was a breakthrough in the sharing process. They presented and shared with me some information and knowledge from their own communities (Report 7, Building relationships, Chapter 4), and I observed that my respectful approach and interest for their culture made them more confident when presenting. I noticed that the girls felt very comfortable and delighted in showing me about their cultures. At this point they gained more trust and respect in me as they understood more about my background and interests. I perceived that it is important to get to know the background of the participants involved in the research in order to develop empathy and compassion to understand the different realities, building a respectful interaction and intersection of knowledges.

As we learnt more about each other, we asked about our cultures. The girls were extremely curious and interested in the diversity of Mexican cultures, as I was interested in their cultures. Through seeing the diversity of cultures in Mexico, I saw that the girls showed that even though they live in Australia, each of them came from a diverse place with unique and sometimes similar resources and have different knowledge to share. We developed empathy when we realised that for both of us, English was our second language, I am also a student, and I also make mistakes in language and during the process. Australian teacher 1 pointed out ‘the girls saw that Desiree (me, the researcher) is at the university and she makes mistakes sometimes too, and she is learning ... and she’s fun and that’s what they enjoyed’.

This respectful intersection of knowledges sessions support Kelly and Kennedy (2016, p. 164) assertion stating that ‘…often it is not until they (Indigenous peoples) have contact with other cultures that they have an increased awareness of their own differences and feel
the need to protect those differences’. In this exchange of cultures and ontological standpoints, IYW became more aware and prouder of their own culture and observed differences and commonalities. An evidence of this sharing and mutual learning is shown in this student 10 statement: ‘A positive experience was to show other way to your (her) culture and how every culture is different.’ Student 7 also indicated, ‘Show them (outsiders/the researcher) more about our culture.’ As the girls reflected on our different cultural practices, they recognised the importance and uniqueness of their own culture, community, knowledge and practices. Researcher: ‘Do you think that sharing my culture helped you to see the difference and similarities to different cultures?’ Students 11, 12, 13: ‘Yes’ They not only learnt about other cultures, but also how to show and share knowledge about their own culture and practices. Student 4: ‘I learnt how to share knowledge’. Student 10 stated that, through this project, she found clarity about what she wanted to do in her future: ‘I really enjoy doing the project with you and it’s clear for what I want to do in my business for the future’. Sharing cultures allowed the development of consciousness around their own culture and practices: Student 6: ‘I learn a lot of the girl (researcher) and learning about them (Mexican Indigenous cultures)’.

The analysis of students’ and teachers’ voices show that by sharing cultures, participants can build connections and realise the importance of a cultural identity and the uniqueness of each culture according to place and diversity of resources. Australian Teacher 1: ‘Through mutual learning the students realised that each culture in unique and has regional elements, they identify their place and the diversity.’ Below, I tease out the intersection of ways of knowing through different elements that I found significant and interconnected throughout the whole process: respectful and flexible communication,
mutual understanding and learning while sharing knowledge and overcoming challenges and discomforts.

**Respectful and flexible communication with mutual understanding**

The principle of respect is crucial while working in a collaborative, multicultural and interdisciplinary way. Wilson (2008) claims that for the Elders, respect is a basic law of life, and regulates how humans treat Mother Earth, the plants, the animals, and humans of all societies. Respect is also one of the protocols required for human ethics (NHMRC, 2007), and is mentioned in other protocols and documents aimed at developing a positive Indigenous collaboration (Kennedy et al., 2018; B. Martin et al., 2016). Respectful communication, consultation, and collaboration are required whenever a commercial application of Indigenous culture is attempted (Kelly & Kennedy, 2016). Respect was essential in this study to create a positive environment to provoke freedom, and to develop and/or enhance the feeling of liberty to be creative.

Flexibility, freedom of expression and other forms of communication were essential for all participants to contribute to the project. Teacher 3 indicated:

‘They had a lot of freedom in the way they do the things as well. The equipment was broadening and everything, but it wasn’t like in a normal art lesson that they were producing one particular thing. It’s a lot of freedom in what they were doing, and it was more expression for them.’ (Australian Teacher 3)
Teachers’ voices asserted that CCoD is a respectful methodology as participants build connections and relationships, reflect on similarities and differences within cultures, enhance cultural identity pride and the participation from all contributors in the development of the design project:

‘The project is respectful for both parts, students and researcher. The sharing cultures is where participants build connections and make them realise not only the similarities and differences of cultures, but the understanding and importance of cultural identity through experience other cultures.’ (Australian Teacher 1)

Another important element in communication is the balance between speaking and listening, or mutual learning-understanding. There should be a balance between speaking and listening, so the participants have the best opportunities of observing and reflecting to understand diverse onto-epistemologies. Understanding the emotional and intellectual work of intercultural collaboration between parties is essential to achieving empathy, as in different cultures there are different rules, language and protocols for conducting conversations. As teacher 1 observed in the quote above, the experience of intercultural communication is an important part of intercultural collaboration, practice and experience. Taking into consideration IYW’s worldviews, for instance, one teacher implied that communication between participants happened throughout the design project as students participated through the whole span of the Biocultural Workshop. Australian teacher 2 stated that CCoD is a very respectful process as it involves all participants in the development of the project:
'It is a very respectful process because it allows students to participate in the actual development of the design of the project, and to give the perspective so the whole nature of the co-design project, rather than, saying this is what is going to be, all were involved in the project together, I think that is the main difference in to be respectful.' (Australian Teacher 2).

Communication exists in different ways such as verbal (oral or written), or non-verbal and some methods can help to facilitate this communication. For example, gestures, facial expressions, body language, tones, gestures, visual/observation such as in multimodality design (Leander & Boldt, 2018). In the CCoD process, there is evidence of the flexible ways to communicate and share knowledge, such as yarning, talking, telling stories, writing, doing presentations, art and design. CCoD methodology is proposed to manage this intersection of knowledges as a dialogue and yarning between participants (see Biocultural Workshop process in Chapter 4). This dialogue should be fluent, safe and transparent in order to develop a successful relationship and Biocultural Workshop, while giving the participants self-confidence to share their own inherent knowledge and skills.

As student 2 articulated, ‘I never picked any skill, it just came out of me.’

In this enactment of CCoD, the data has shown that certain barriers of communication and understanding between participants were broken in a respectful way, as there was no conflict between people -students, researcher, teachers-, and the collaboration flowed throughout the process. The mixing and interweaving of the epistemologies helped IYW to be able to harness their opportunities and concerns, opening their creativity through their own values. While combining IYW’s ecological knowledge with other points of view, they were able to thrive collaboratively, being resilient not only environmentally but in
social matters. As worldviews affect peoples’ belief systems, decision making, assumptions, and modes of problem-solving (Hart, 2010).

**Mutual learning while sharing knowledges**

In CCoD, the values of reciprocity are essential, such as mutual learning, understanding and benefit, which are embedded in the project as core elements as part of both Indigenous and co-design methodologies. According to Bartleet et al. (2014); Scholz (2001), a critical element for students, teachers and researchers is mutual learning, or two-way learning, which is a reciprocal process when both sides learn and teach at the same time facilitating cultural exchange.

In this dialogical process, participants are teaching and learning all the time, thus, mutual learning and understanding continuously happens. As the Biocultural Workshop process unfolded, participants felt increasingly equal and free to express and share their knowledge, culture, ideas, practices, skills and experiences, and communicate with others. At the same time, they developed their capacity of listening and understanding other knowledges and acknowledging and understanding the importance of their own culture while sharing in a mutual reflective engagement activity. Respect must be present at all times to have a comfortable environment where freedom and creativity can happen without judgment or bullying.

Reflecting on the activities is part of the steps in the Biocultural Workshop and the CCoD methodology, similar to what Freire (1978) argues by proposing that with critical thinking and critical reflection an educational change and awakening of critical consciousness can
happen. As mentioned before, change is in theory, action, reflection and critical consciousness (Freire, 1973). The Biocultural Workshop facilitates this contact zone as each participant can benefit the project with their own knowledge and experience. However, there are potential limitations to this model, as, in this case, the Biocultural Workshop was conducted within an institutional environment. Teachers, therefore, needed to see results (biocultural projects) and to incorporate the Biocultural Workshop as part of the ‘Caring for Country’ class and program. Because of this, the IYW saw the researcher first as a facilitator, and only later on as a peer and a collaborator rather than a classroom teacher. Teachers also felt like collaborators over the Biocultural Workshop which is important for CCoD. Over the process the teacher 3 started to see her role as collaborator, ‘I didn’t really feel that I was teaching. I feel like collaboration, it’s changing ... it’s more engaging with them.’ (Australian Teacher 3).

CCoD welcomes people from diverse cultures (in this case diverse Indigenous and non-Indigenous people) and disciplines and with a variety of experiences, the projects become more meaningful, useful and beneficial than the ones that involve just one standpoint. The projects that involve diversity have better outcomes than the ones that only have one point of view in design approaches (Garduño García, 2015). This research claims that CCoD methodology should be relying on a variety of ontologies, epistemologies, cultures and professions, continually nurturing the projects to achieve improved outcomes. I observed that even though the girls live in the same boarding school they do not talk about their cultures much. Through the workshop they have a platform to share and discussed their own culture in relation to other Indigenous cultures, in Australia and Mexico, understanding that diversity of languages is not the only difference between cultures.
Decolonizing research through relationality

Research can be seen as a colonised process in many cases. Teachers in Australia stated that other research studies that have been done at the school have not had benefits to the school and students. Decolonizing research theory through co-design practice is underpinning the CCoD Conceptual Framework and this is vital to the findings and success of the CCoD methodology.

The way of doing research is different between researchers. Teacher 3 in Australia emphasised the difference of the present CCoD methodology and research to other research in the way of being respectful:

‘I’d like to reiterate that the really important thing about this project is being your respectful approach Desiree. And I think it is a credit to the way you conduct research, that is has progressed, and project completion, is a huge achievement, I think is really well done.’ (Australian Teacher 3)

Following, a teacher’s quote gave insight into how CCoD used ways to decolonize research through relationality between participants in action. The approach of the CCoD methodology and research was not to impose knowledge and expertise but to consult, share, collaborate and foster mutual learning between participants, Australian teacher 2 stated:

‘I like the way, you know, is a very different approach to research and it is not about you as an expert of your field to coming in, you have those skills and knowledge but you’ve
come in and consult as much with the girls and with the staff about what the research might look like. As much as you have given a framework for to sit within, so that is being really fantastic.’

For the teacher also, this research discourse was really different in a positive way. There had been some tensions in the past over research that was not collaborative of understanding of the school’s Indigenous context. By contrast, CCoD is the type of research and methodology that the school would like to engage with in the future as it is a respectful process and invites input for everyone throughout the process:

‘I know that we have not agreed to pursue a research in the past, because there is a concern about the researcher not necessarily working collaboratively and might not understand the context of the school, and how important it is to have a respectful process and input for everyone.’ (Australian Teacher 2).

Teacher 2 pointed out my research as a having different approach and achievements:

So, it is a really good achievement.’. ‘It is a very different research, and it is making me think really different about what research might look like in the future at the school. I know that there has been tension at the school, around having researchers coming, maybe gather information, gather data and then leave the game (Australian Teacher 2).

The relationality between participants and the agency within the methodology process helped to decolonize this research. The process and aims for the research and the project
were achieved, and the participants (staff and students) contributed through the whole span of the process individually and in teams:

‘You’ve clearly needed to gather information, and to follow a process but you’ve left behind a lot, a great deal for staff and for students, about themselves, to understand themselves better and within a team. Also, there are really concrete things that can come from it, that sort of approach. So, the methodology that’s been taken I think is great, is amazing.’ (Australian Teacher 2)

Teacher 1 stated that it was a good collaborative and mutual learning approach, knowing the girls through sharing cultures within a longer amount of time in comparison to other research conducted at the school. She also specified the pleasure of having a project from start to finish:

‘It’s been a very good collaborative approach, sometimes gets hard, a lot of the time for the students to connect with visitors to come in to the school; especially when it’s a research project or anything like that because quite often, people come and go, and they come in to do that research project and they leave and don’t take the time to develop that connection. I think this time it’s been different because you have been here for a longer amount of time, it took time in the first place to share your culture and to get to know the girls to the point that on a Friday it’s become it is Desiree’s time and they know that’s what was going on. It is a pleasure have a project from start to finish.’ (Australian Teacher 1).
In these teachers’ statements, it is evident that having a project from start to finish is essential and the longer the time, the more connection between participants that can lead to a more decolonized research approach.

‘It’s being great actually to have a project that goes from start to finish, for a lot of them. So, they’ve done a project with, they’ve made a connection with the person, and that person remained with them until the project it was completed, it’s not a case of, they are gone, and they need to finish the project. It’s something that is being all the way along, and now the connection with the school is great.’ (Australian Teacher 1).

Another teacher suggested that power relations can still exist as the beginning of the project should be a guided process, and sometimes the facilitator needed to introduce concepts. As the project progressed and the students developed more autonomy, the researcher repositioned herself as a collaborator and peer:

‘It is a guided process where the facilitator gives concepts, collaborative with participants work in the concepts and keep to the next step of the process, at the end of the project a reflective thinking of the whole process happens to understand how the project work together and understand the process and achievement with another perspective.’ (Australian Teacher 1)

It is essential that academics and designers using this methodology understand the theory and practice of decolonized research through relationality.
3. Human Agency and Cultural Identity

In this research, human agency is referred to as the agency in positionality (Martin, 2017), emotional and spiritual aspects, that have not been fully recognised in research and academia in the field of design, even though for Indigenous peoples, they are crucial components in their onto-epistemologies. The Indigenous academic McGregor (2005) identified the dichotomy and the challenges in balancing her Indigenous and academic knowledges, and in finding her positionality with respect to her personal and professional settings, where she confronted the diverse ontologies and epistemologies that she has been facing. While this balance can be challenging, it also can have many benefits, offering the chance to acquire skills towards changing the ways of seeing and analysing circumstances while using both worldviews. The process of being empathic or unsympathetic according to the own values and interests can be paramount in positioning Indigenous knowledges in a way that collaborates with non-Indigenous people and vice versa.

It is essential to recognise that human elements such as cultural identity, spirituality and emotions are fundamental when collaborating with Indigenous peoples, and they are considered in this research. Making western academics aware of the importance of these elements can be of vital importance and very valuable to the decolonization agenda in CCoD, research and education. The CCoD Conceptual Framework creates a relational platform for this to occur and it is here that my own positioning and Indigeneity spring from in this research (I elaborate further in the next chapter). The next subsections are related to how human agency is supported by spirituality, overcoming challenges, cultural identity pride and positionality as a way of building Indigenous resilience.
**Spirituality**

In order to respect Indigenous ways of knowing in this research, both the physical and the spiritual nature of realities should be fully accepted as ‘inseparable realities’ and ‘multidimensional knowing’ (as spirituality are part of Indigenous ontologies (Hoffman, 2013) and the everyday life). Part of respecting Indigenous ways of being and doing, however, comes from an understanding that it is not necessary for spirituality to be explained or have tangible evidence (dialogues) of spirituality, but feel it, as it is part of Indigenous worldviews, not necessarily accessible to non-Indigenous people or outsiders.

CCoD explores the understanding of how Indigenous youth relate their activities as entities of the interrelated world towards the resilience and well-being of each entity, either physical or non-physical (spiritual). In design, every product or service should have meaning and significance and give priority to spiritual, biological and social dimensions according to Indigenous ontologies (Pascoe, 2014). For instance, some of the girls made references to their dreaming when telling their story or part of their worldview through their biocultural projects. Therefore, the data showed a relationship between the objects and Indigenous students’ dreamings and totems that are an important part of their non-physical world (see Figure 86).
This research acknowledges and respect the spiritual nature of the self and knowledge, which is an inseparable part of the ways of knowing and doing in Indigenous worlds. Australian teacher 1 pointed out that the use of useful products combined with Aboriginal art are not as common in the IYW communities, and it can be a different form of presenting their stories and showing their knowledge, Australian Teacher 1 stated:

‘For example, that decorated pots aren’t something that normally it’s around their community but is something they could access and it’s a wide ... they could change a method of presentation of what they do, so for example, a painting of a rainbow ... on a pot normally would be something just fine but it’s a beautiful piece of art work and then, it becomes an object to hold the plant or an object which is decorative, mean something and does something else in the hands, something functional. They realise in the symbols that is artwork that can be used to have another performance, another way of doing, and that’s great.’
In Mexico three teachers pointed out the importance of teaching spirituality through storytelling, yarning and legends to respect Country (the material and immaterial). Teacher 1 and 4 stated the importance of mother land: ‘If we had respect to mother land life would be so different. I think we need to teach spirituality, it is really important for children to grow up with spirituality.’ (Mexican Teacher 1)

‘In Mexico there is a huge respect for the land. If you go to the field you need to ask for permission to the mother land, you can offer something and feed her. When someone die, people need to be buried and feed the land with food, and same when you build a house.’ (Mexican Teacher 4)

Teacher 2 commented on the Legend of the ‘Chaneque’ as an essential way of knowing in the use of the natural resources from the land: ‘El chaneque’ is the owner of the land and nature, you need to ask for permission when you are using natural resources of the land, if you do not do it he can make you black magic.’ (Mexican Teacher 2)

For this research, it is essential to consider emotions, intuition and spirituality, as they have a strong potential in the acquisition of cultural identity pride. A fundamental tenet within an Indigenous paradigm is humans are physical, mental, emotional and spiritual beings (Bopp & Bopp, 1989). Within this holistic understanding of the nature of the individual, it is believed that the more these aspects of the self are in balance and harmony with each other, the greater the potential for a person to access the various sources of knowledge. Through the heart, the emotional part of the self, individuals have the opportunity to acquire a higher level of knowledge and understanding (Hoffman, 2013).
These virtues make people singular and unique, thus, people can follow their passions, be creative and innovative in a positive way.

**Overcoming challenges and discomforts - Emotion management**

CCoD methodology supports a philosophical and empirical enactment of the discomfort zone because of the possible positive benefits for the participants. These discomforts and inconveniences, however, can be perceived by an Ethics committee as a risk or possibly harmful and can make the research and CCoD methodology seem non-respectful or unethical while collaborating with Indigenous peoples. According to the National Statements on Ethical Conduct in Human Research (NHMRC, 2007) research proposals must be designed so as to ensure that any risks of discomfort or harm to participants are balanced by the benefit to be gained (National Health Medical Research Council, 2003). Somerville and Perkins (2003) assert that the discomfort zone of cultural contact can produce tensions, but can at the same time also generate enhanced hybrid outcomes, which are considered in CCoD. As mentioned before, the discomfort zone is a crucial stage, as it is where most of the participants overcome tensions, limitations, fears, negative feelings, frustrations and challenge.

For instance, for students, the discomfort zone happened during step two of the Biocultural Workshop while co-discovering at the beginning of the project. For them, in this step they had negative feelings and emotions such as student 11, she stated that she did not know what to do at the beginning: ‘In the beginning I didn’t want to do it. I forgot. I was, I don’t know... but I didn’t expect what was coming’. Student 12 stated ‘At the beginning I thought it would be boring.’ I also observed that the challenges were in the start of the project.
while they felt nervous, bored, afraid, they did not know what to do, or forgot things. Also, in the negotiation with others, in decision making at the beginning.

Some of the discomforts and inconveniences were psychological, feelings, stress, anger or fear related. As a result, the students explained how they overcame these challenges gaining positive benefits for their futures. For example: Student 2 had exhibited some previous reluctance to doing the activity as she felt that she could not do it. However, after the task she indicted that she had overcome her challenge when she said: ‘Creating and using all sorts of different things, something like leaves and raw sticks was pretty easy. But by making dreamcatchers using leaves, sticks and feathers was so hard for me. But at least I finish it all and at the end realising that everything was pretty easy by choosing the right decisions.’ At the end she realised that ‘choosing the right decisions’ helped her with finishing the project more easily. In knowing and understanding Country she started to get more familiar with the elements and make the virtuous decision to finish her project. This quote shows that problem-solving and decision making were elements experimented, developed and enhanced in the Biocultural Workshop and show evidence that CCoD can support participants in the growth of confidence in the decision-making process within the scope of the project.

Overcoming challenges can happen through trial and error, messing up and trying again, not giving up and keeping going. For instance, some students expressed that this moment of overcoming challenges and discomforts was very important as even if they messed up, they could still accomplish the goal, and start again with positive outcomes: ‘In products, I messed up so I had to start again.’ (Student 4). Another student shared negative feelings, but despite that she overcame the challenge and finished the project: ‘The negative part
was it didn’t come out the way I planned it to be. The positive part was the pot painting came out awesome.’ (Student 7). The students commented how they ‘messed up.’ (Student 4) as part of the design process but persisted to start again and work to develop a completed product. In overcoming these crucial moments, it was clear that the girls had more self-confidence and were not scared to mess up again and they were willing to experiment with freedom. The challenges that everyone overcame together through the process, such as frustration, wanting to give up, messing up, fear, stress and sadness, helped build the resilience necessary to bring the project to completion.

One challenge, perceived in a session, was that some girls were not patient, and if they could not do something or they needed to make a major effort they just quit and tried to do another project. It is important to encourage them to overcome problems and develop critical thinking and strategies to finish their projects, as the outcome and process are critical and important in CCoD. Patience is a key skill towards project completion. Even with challenges through the process, the girls never gave up, they always gave themselves a second chance, co-designing and co-developing a new project. Student 7 stated that ‘I have learnt that you can’t rush, some things take time’. In the discomfort zone, time and patience are essential to achieve self-confidence, empowerment and the beginnings of self-determination for the near future.

When collaborating and researching with Indigenous peoples, researchers and designers should have ‘sensitivity, openness and commitment to conducting the study.’ Teacher 1 pointed out that cultural difference helped to develop empathy with IYW. ‘The confidence and cultural difference of the researcher help to develop empathy with the participants, they can know that she (the researcher) made mistakes, and she solved the problems and
challenges as well, she is learning, and she is fun.’ The CCoD Conceptual Framework supports practice of relationality, sensitivity and openness and that is why it is successful.

A teacher from Mexico reflected on the need to incorporate human components such as emotions to be an integral development towards students’ self-confidence:

‘The academic development nowadays is not integral, and it is what education needs. We need to work in the human component, emotions, frustrations, fear, children need to feel that they are capable of doing stuff, complete projects, feel self-confidence.’ (Mexican Teacher 2)

In emotional bonding, during the process it was important to maintain trust and engagement in the relation not only to the group but for possibilities after the workshop within their communities and people. One of the students stated:

‘I really love making dream things and I really love it, I was so happy to make them so now I can make them anywhere even when I go back to my community and show other people and my brothers and sisters. I really learned lots out of it’. (Student 1)

A teacher stated that having a researcher with a positive approach helped the girls to create a bond and a cheerful environment. ‘Seeing the researcher as a positive person and grow through the process together helped the participants to bond and create a ‘cheerful’ environment.’ (Australian Teacher 1). She also indicated that in this case the researcher was seen as a revitalising person because of her positive approach which the participants appreciated. The participants were ‘happy and cheerful to spend time with the researcher.’
The affective and emotional aspects of the relation between participants is crucial for empathy and to acquire trust and gain confidence. These elements were essential through the process and to reach the Biocultural Workshop completion. In qualitative data analysis, feelings and emotions are being recognised as a strategy to gain deep emotional insight into the social worlds. As Saldaña (2014) discusses, virtually everything humans do, have parallel connections with emotions and feelings that are related to reactions and stimuli for people’s actions. The emotional responses during the data collection and fieldwork were also valuable during the data analysis in this research. It is important during such analytical reflection, to assess researcher and participants’ emotional reactions, in order to recognise the potential of the research as well as the intangible outcomes for the participants (see next section).

**Cultural identity**

It is essential to recognise the importance of Indigenous peoples’ onto-epistemologies and knowledge as part of cultural identity enhancement. For this research, cultural identity is defined according to Stuart Hall (2014), as the conception of cultural identity relies on a shared cultural identity, within history and ancestry or a collective identity such as in Indigenous communities. CCoD focuses on the conservation, recovery, enhancement and development of Indigenous cultural identity within the variety of Indigenous
peoples/participants. Cultural identity is not just about ‘being’ but also about ‘becoming’ and as Hall states, identity ‘belongs to the future as much as to the past. It is not something which already exists, transcending place, time, history and culture.’ The notion of becoming or co-becoming in a relational world (Country et al., 2016) is significant for CCoD, because this methodology emphasises relationality in Place towards transformation through process and action. This change occurs at a communal and an individual level. Individual or self-cultural identity is a process of inner exploration, recognising cultural and individual uniqueness, positioning yourself within culture and acquiring self-confidence through relations with other members of a community. Identity is a combination of self-identification and the perceptions of others (Weaver, 2001).

Cultural identity is a theme that emerged as a pattern during the Biocultural Workshop and interviews with the teachers in Australia and Mexico, this pattern was found in the third chronological phase of the data analysis in the open coding step (see Chapter 3). The Indigenous students enhanced their pride in their cultural identity by building relationships while experimenting and sharing cultures. In the Biocultural Workshop, biocultural projects are based on their culture and knowledge, reflecting on the process and overcoming challenges throughout the process, and presenting and selling their biocultural products acquiring pride for their work, skills and knowledge. According to teacher 1, the Biocultural Workshop not only had benefits in acquiring diverse skills but also in enhancing their cultural identity:

‘The benefits are that they are taking through all the design process, and it’s working collaborative together. I think that also gives them an opportunity to develop their critical thinking skills a little bit more, and the problem-solving skills, as well is a fact that they
use the natural creativity, and their cultural identity is part of that.’ (Australian Teacher 1).

Developing a cultural identity consists of a lifelong learning process of cultural awareness and understanding (Zimmerman, Ramirez-Valles, Washienko, Walter, & Dyer, 1996). Because the formation of identity takes place over time a strong cultural identity may increase with age (Martinez & Dukes, 1997). This is where cultural identity intersects with the CCoD Conceptual Framework.

The students’ responses mentioned in the section ‘Respectful Intersection of Knowledge Construction’ in this chapter above, show that sharing cultures is crucial to realising the importance and uniqueness of the students’ own culture and an incredible ability crucial for enhancement of cultural identity and learning. Some theorists agree that identity exists, not solely within an individual or category of individuals but through difference in relationship with others (Weaver, 2001, p. 243). Cultural identity is not static, rather it progresses over time during which an individual has a changing sense of who she/he is, perhaps leading to a rediscovered sense of being Indigenous (Martinez & Dukes, 1997), cultural identity goes beyond language and blood (Palmater, 2011). The girls shared Place in the Biocultural Workshop, and in this project, they talked about their own culture and knowledge in their own communities, not only diversity of languages but diversity in epistemologies. It is important to encourage Indigenous culture and knowledge sharing, as they become proud of their Aboriginal knowledge within their Country towards biocultural diversity conservation, even though the participants are off-Country in a boarding school. When IYW realised and made conscious the importance of their Country
and knowledge, it highlighted the importance of using the knowledge and culture in a diverse manner while collaborating through CCoD.

Supporting Steen (2013), this research points out that discovering girls’ own hidden skills encourages them to be more curious and creative sharing original thoughts and having ownership in the projects: Student 8 pointed out: ‘I learnt how to be original. Sharing original thoughts but having ownership.’ According to the Australian teachers, CCoD helped the students to be more confident in knowing, understanding and using the uniqueness of their own culture and knowledge. Australian Teacher 1 – ‘The students are more self-confident to use their cultural identity and use diverse possibilities to present their uniqueness.’ They expressed the view that the pride in culture that the students developed throughout the process of CCoD was outstanding. It was identified that cultural identity awareness can be approached through the mix of the students’ Indigenous knowledges and practices, the teachers’ and researcher’s experiences, knowledge and guidance, and the resources of the place. Australian Teacher 2 stated:

‘The project is respectful for both parts, students and researcher. The sharing cultures is where participants build connections and make them realise not only the similarities and differences of cultures, but the understanding and importance of cultural identity through experience other cultures.’

This methodology is proposed to create a balance between Indigenous cultural identity and how the students can contribute to western society so that they have the option of developing environmental business enterprises while preserving culture. Australian Teacher 1 stated ‘I think it’s a lot more confidence in themselves and being able to use
their (Indigenous) cultural identity.’ Indigenous young people should have the option to explore the possibility to use their Indigenous knowledges and practices for employment and living nowadays. Evidence shows that Indigenous youth sometimes need incentives to learn their own Indigenous knowledge and they need to know that they can have significant benefits because of their Indigenous knowledge:

‘I suffered that problem (oppression) in the 60’s when I was in primary school. In school I was forbidden to speak in Zapotec. Even though my mother always spoke to me in language at home. I remember that in the 80’s they started to teach Zapotec at university and the students who knew Zapotec could apply for a scholarship. This was an incentive for me to recover the language and learn it 100%, now I can speak 50% and I can understand 100 %’. (Mexican Teacher 5)

Even though language is an important part of strong cultural identity, my research claims and shows that language is not the only way to boost cultural identity but though diverse ways of knowing and practice production. Incentives to study Indigenous languages and practices to boost cultural identity pride such as culture, customs, practices, design, classes, rituals, handcrafts, products, etc., to recover Indigenous knowledges in general are very important in colonised countries. Because of the loss of traditional forms of cultural education, contemporary policies and curricula need to place more value on recovering and sustaining culture and cultural identity. The Biocultural Workshop had the limitation of language of facilitation as everyone needed to decide on one language through which to communicate throughout the process. Interpreting the quote above, it is crucial to encourage Indigenous youth who are struggling to maintain their knowledge to keep it alive through real life incentives. Policies should be focused on keeping biocultural
diversity in education with attractive incentives and future jobs for Indigenous peoples based on their Indigenous knowledge.

When collaborating with Indigenous peoples, there should be enhancement of self-identification and self-perception as key components of identity. In CCoD it should be encouraged as community differentiation as well as identification. Indigenous identity is connected to a sense of peoplehood inseparably linked to sacred traditions, traditional homelands, and a shared history as Indigenous peoples (Weaver, 2001). CCoD acknowledges that a person must be integrated into a community, not simply stand alone as an individual and the sense of membership in a community/group is so integrally linked to a sense of identity. During the research, CCoD was developing a community of practice throughout the Biocultural Workshop as part of the becoming. Cultural identity can be enhanced through self-identification, community identification among the group and external identification (Weaver, 2001), while sharing cosmology, values, beliefs, sacred traditions, shared history and worldview. CCoD allows for the recognition of uniqueness through sharing different cultures, and the self and community identification in realising similarities in cultures.

Another finding in cultural identity as pattern is that the teachers indicated that the CCoD methodology has the potential to enhance cultural identity while also promoting fine and gross motor functions, developing critical and reflective thinking and supporting students in managing their emotions.

‘These types of art and crafts help to promote the fine and gross motor functions, and should be learnt since we are children. While more work details the child develop a fine
motor functions and patience, but with dance and theatre the motor functions are grosser. Both help to develop critical thinking, reflective thinking, coordination for a better education and formation.’ (Mexican Teacher 2)

At the beginning, they did not know how to link the methodology to the educational program and subjects but after talking they said that CCoD could fit in biology, technology, art (gastronomy, dance, music) and state subjects. Mexican Teacher 1 – ‘CCoD is a methodology with important potential but is needed to explore in different levels.’ Another teacher pointed out the importance of the aims of CCoD to support Indigenous knowledges significance through practice. Mexican Teacher 2 – ‘I like that CCoD targets to Indigenous culture, development of skills and motor functions, critical thinking and significance. CCoD also brings art, collaboration and emotion management. With this the process and the outcomes are important.’

A limitation for CCoD is the possible lack of cultural identity and different criteria of sense of belonging that can threaten the biocultural diversity conservation and regeneration. An unexpected but significant result emerged when interviewing the teachers in Mexico. In the Mexican school four out of five teachers self-identified as having Indigenous heritage. In the first interviews, teachers 1 and 2 were hesitant to identify themselves as having Indigenous heritage, but by the end of the interview they decided to identify this way. Their hesitation and doubt in the beginning of the interview was because they do not know how to speak Zapotec.

Positionality is important in decolonizing research and when collaborating with Indigenous peoples. In the Mexican site, in the second interviews, teachers 3 and 4, in the
Beginning did not identify their Indigeneity because they do not speak language as well but one stated that he follows culture and both of them have Indigenous heritage. Teacher 5 stated that he acknowledged his Indigenous heritage, as he knows about costumes and he learnt knowledge from other generations and he speaks Zapotec language. One of these teachers does not consider himself as Indigenous even though he does have Indigenous heritage, as he said he does not follow culture or speak language. The findings in the interviews made me realise that not knowing Indigenous language should not be a limitation to recognise my Indigeneity. The recognition of my own Indigenous heritage was an example that cultural identity should not only be encouraged in IYW but in the researcher as a reciprocal and mutual process. Identity is not a fixed construct.

According to the observations and field notes, Indigenous teachers in Ixtlan de Juarez feel and think that they are Indigenous if they speak mother language (Indigenous language), have Indigenous heritage, follow customs, have spirituality and honour the motherland, know history about the community, cook traditional dishes, follow community art and dances, and know legends and myths.

Different authors found that cultural identity is interconnected to heritage, culture, practices, history, beliefs, ancestry, language, core values, loyalty, clothing and phenotypical appearances (Assmann & Czaplicka, 1995; Smolicz, 1981; Wakholi, 2017; Weaver, 2001). These conversations with the Mexican teachers seem to provide evidence of how cultural identity is perceived by each teacher according to four main elements: whether the person has Indigenous heritage, speaks language, has a sense of spirituality, and follows culture and customs. In this, support of cultural activism (Wakholi, 2017) towards cultural identity building, CCoD is proposed to promote the incorporation of
Indigenous knowledges in western society in order to enhance the Indigenous cultural identity with IYW.

In the Mexican site, I observed that it is important to have Indigenous teachers at the Indigenous schools, as they contribute to Indigenous education introducing their cosmovision within their teaching. *Mexican Teacher 5 – ‘Indigenous teachers like me, give to the class its own Indigenous knowledge.’* Some teachers spread the knowledge unconsciously, as the knowledge is embedded in their teaching. The teacher 2 sees Indigenous education relating to traditional customs and history. *Mexican Teacher 2 – ‘With their (Indigenous teachers) cosmovision, they relate the classes to their customs and history of the community.’* In the Mexican school approximately 50% of the teachers are Indigenous. I observed that most of the Indigenous teachers think that what they are teaching is the same as in other places, communities and schools, they need to realise the uniqueness of their own teaching and culture. The interview data reveals that teachers are aware of the need to strengthen the cultural identity for themselves and their students, the Mexican teacher 5 expressed that *‘It is good and important to rescue it (Indigenous knowledge) as strength the cultural identity in children.’*

I also found opportunities and possible improvements that give the methodology space in this Mexican community. There is a belief about energy and spirituality enhancing cultural identity pride and love for culture and environment. There is also opportunity to strengthen Indigenous cosmovision, value Indigenous work and practices, build a new secondary school and give balance between forest management resources and customs. Furthermore, in building language, working towards integral projects for students, and increasing motivations for Indigenous projects, opportunities can increase in using ancestral
technology with new technology. The CCoD Conceptual Framework can act as a facilitation or platform for articulating and materialising these opportunities. CCoD demonstrates that participants develop self-esteem, self-confidence, and self-respect and biocultural diversity awareness, reconnecting with their Indigenous knowledges and practices enhancing or developing cultural identity pride.

**Positionality, Discovering My Cultural Identity**

The evidence below illustrates that not only IYW might benefit from this methodology but also myself as the researcher/designer and a person, as I discovered my heritage to shape my Indigenous cultural identity. The researcher’s journey, my journey, has been one of constant understanding, learning, feeling and discovering about the plurality of ontologies, epistemologies, spirituality, process, and practices. As well as understanding and discovering my own Indigenous cultural identity within that.

Seeing other people having strong cultural identity made me reflect on where I really come from, my ancestry, questioning myself. After the fieldwork in Mexico, I researched my ancestry, I stayed a few days with my family and I asked them about my grandparents and great grandparents, where they were from, why we (my family) followed some customs. We started critically analysing and inquiring about our past and present beliefs, values, gifts and our purpose in life, which shapes our futures. I discovered that I have hybrid heritage, more than half of my ancestry comes from Indigenous heritage in Mexico and Spain. The Australian and Mexican fieldwork helped me to realise that cultural identity pride is essential to me and many people, in order to position ourselves, be self-confident and understand different realities. In my experience, it was important to know my
background, my roots, understand my customs and habits, my family values, upbringing, worldview and know my past influences which enhance my Indigenous cultural identity in my present and future. Within this discovery, I recognised that I had no idea about my family background, I did not know about my roots, background and how these influenced my anatomy (body features), mind (values and ontology), emotions (emotion management), spirituality (my beliefs and gifts), intuition and cultural identity. This critical analysis and research are the start of building my way of becoming.

In my personal journey, I discovered that many of my great-grandparents and my grandparents had Indigenous heritage. On my father’s side, I have heritage from Chiapas the Chamula and Lacandon Countries and from Guanajuato Nahuatl Country within Mexico. On my mother’s side I have heritage from the Basque Country in Bilbao Viscaya, Spain and Cuautla Morelos and Oriental Puebla (non-Indigenous). The roles of my male forebears included fishermen, travellers and natural healers knowing about herbs and making bush medicines. They engaged in building their own houses, designing their own furniture, cooking with local food, raising their own animals and having fruit trees and growing herbs. One of my grandmothers was a nurse, and one of my grandfathers was a writer in a newspaper, non-Indigenous roles taken up by Indigenous people after the colonization of Mexico. Some of my ancestors had strong spiritual gifts and some had strong religious beliefs. Spirituality is more associated with aspects of connectedness, transcendence, meaning and purpose of life (Jones, 2018), integration of the dimensions of mind, body, and spirit.

I am developing a better understanding of my parents’ worldviews and what kind of education they gave us, to me and my siblings, according to their education and priorities.
to fit in western society in Mexico City. They were living the cultural interface with challenges presented to them from two ontologies that were not in alliance with each other.

I can only start to comprehend how my values, beliefs, and spirituality, have underpinned my realities for worldviews. I take the opportunity to locate my personal identity with respect to diverse perspectives and cosmologies as a benefit as well as challenge.

Even though I have grown up within a western society in Mexico, my strong values and my connection to nature and entities in the world keep my identity strong. This research and CCoD methodology made me realise and better understand my Indigenous cultural identity, as I found out my Indigenous roots during the process, being proud of both of my different backgrounds and appreciative of my uniqueness that has helped shape my ways of being, knowing, doing and becoming. This is a significant result of the research and for myself as it positions me differently in my respectful research approach and relationality. This evidence strengthens the importance of CCoD methodology as this type of collaborative and relational methodology potentially affects all participants involved. During the process at the Australian site, I had a strong connection with the IYW because of our strong connection to nature, spirituality and the similar emotional approach that had an effect on me. Discovering my own Indigenous cultural identity while in Mexico enabled me to reflect on the process and to understand better my own Indigenous identity.

4. Benefits to Participants

The outcomes of this methodology are categorised into two types, the tangible and the intangible outcomes, both developed and/or enhanced during the process of the
Biocultural Workshop. Tangible outcomes refer to the material and concrete results (Barad, 2007), the intangible outcomes refer to the immaterial (Barrett & Bolt, 2013).

**Tangible outcomes**

There are tangible outcomes for the research and the participants. For the CCoD it is the development of biocultural projects, and for the research, the CCoD methodology theory, the *Fourteen Axiological Tenets* (see more in section below) and the Biocultural Workshop (discussed in Chapter 4) used as a process to collaborate between participants, that can be applied in diverse Indigenous settings. The tangible outcomes for the students were the biocultural products (images presented in Chapter 4) that have cultural or/and biological meaning and significance which are co-designed and co-developed during the Biocultural Workshop between participants (see Chapter 4, reflection and images 64 to 86). The outcomes depend on the Indigenous school or community involved, the opportunities, needs, aims, challenges, and the resources available within the Place.

The data showed that the relationality between sustainability, co-design and Indigenous knowledges benefitted the tangible outcomes in communicating the purpose of CCoD. *Teacher 2* - ‘They (biocultural products) look fantastic, and I think they’re really nice, you can see the combination of sustainability with design, and also the girls using the traditional artwork, so that’s really nice to see the intersection of that three things.’ This is important as in design, generally designers give more weight to the physicality and utility of the product instead of the cultural significance. Besides being beautiful and useful, products designed through the Biocultural Workshop, they have this additional
significance (Pascoe, 2014). For instance, this pot with a rainbow serpent totem painted by one of the students (see figure 87).

![Rainbow serpent pot](image)

*Figure 87. Rainbow serpent pot*

**Intangible outcomes**

Intangible outcomes are dispositions and skills that are intrinsically interconnected to the Biocultural Workshop and CCoD, participants enhance self-confidence, cultural identity, decision-making, problem-solving, empowerment, self-determination and develop diverse skills while acquire experience. In design, it is understood that the outcome, product or service, is the most important part of the process. If the product or service does not work or is not successful, then the project itself has failed. This research can demonstrate that the process underpins the outcome, as during the process the participants improve personally and skilfully. The relationality between method and content is vital (Martin, 2017), and the CCoD Conceptual Framework enacts this. For CCoD the method is the Biocultural Workshop, which is the enactment of the collaboration, and the content is the theory and tenets of the CCoD which are the guidelines of the methodology.
There are intangible outcomes that Indigenous methodologies and co-design share with education in general. These include skills and virtues required for reflection, for the development of consciousness and transformation, as well as for the forms of emancipation that Freire (1970) sees as an essential quality of education. Freire considers that critical reflection leads to empowerment and consciousness, that has revolutionised the way of thinking and doing in education towards emancipation. Similarly in design, Steen (2013) claims that there are virtues developed while co-designing, such as cooperation, creativity, curiosity, reflexivity and empowerment, and fostering these five virtues ensures the success of co-design projects. Steen (2013) claims that people can learn to think, feel and act virtuously by trying-out virtuous behaviour or by looking at people who behave virtuously. Correspondingly, in Indigenous methodologies, empowerment and self-determination are elements that help people to share power and knowledge, developing recognition, reflection, action towards cultural identity and emancipation.

CCoD supports the development of intangible outcomes, not only as a means to develop and enhance collaborative and individual skills and virtues, but as a means for emancipation, reflective thinking and critical consciousness.

The participants also reflected on the opportunities they could harness in their present and their near future, understanding different perspectives and possibilities they could take control of for their own benefit. For many individuals and organisations, it is difficult to measure and understand the potential and the transformation in participants coming from intangible outcomes. There are some stories in this research that are worth narrating as they describe the powerful transformation during the CCoD methodology.
Student 8 wrote in a response of the reflective thinking activity after the workshop that she acquired or developed the skills of: ‘reflective thinking, critical thinking, problem solving, negotiation, to think creative.’ (Student 8).

Teacher 1 stated that she would ‘definitely’ use the methodology in the school program as it not only tackles personal and professional skill development required by the AC but also the participants can use these skills in their communities. It also creates a positive environment where people ‘felt comfortable’ and could ‘explore freedom’:

‘Yes, definitely. Part of the personal development subject looks a problem-solving and doing simple tasks; so potentially it could be something that they would re-develop, as part of that project. Is a project that can be use with different people, context and ages, it just needs to readjust the requirements and achievements depending on the age. The students felt in the project positive environment and felt comfortable, they can take risks without a lot of responsibility so they can explore freedom. They can use this as a life skill not just within the school but when they come back to their communities, using as a personal and professional skills.’ (Australian Teacher 1)

In CCoD, the use and development of imagination and creativity are essential skills. The use of imagination and creativity is as important as the way of searching for them, it can be individual, personal, professional and collaborative.
Stories informing intangible outcomes

Critical stories should be told to explain the importance and breakthrough of this methodology. As outlined in Chapter 3, narratives are important as in qualitative research it is difficult to measure emotions, feelings, and skills development as intangible outcomes. Narratives are an important method to develop intercultural understanding through yarning (Wilson, 2008) of the events that helped the constructs of the CCoD methodology.

- Decision making and overcome challenges

This narrative is about overcoming challenges and it can be part of the section overcoming challenges and discomforts. One girl was doing her pot design (see Figure 88), when suddenly the pot fell down and broke into many pieces. She was shocked, she laughed and then she got very upset. After that, the art teacher suggested to her that she could do an art piece made of all the pieces to save the hard work (see Figure 89). The student therefore had the choice to either create a new artwork from the shattered pieces, or to start another project. This choice allowed the student a degree of agency in the decision-making process, which was crucial to overcoming the challenge of the accident. She chose and made a piece of art from many of the broken pieces. A strong theme in her design was the saltwater, so she made a wave out of the pot broken into pieces (see Figure 90). There are many ways and attitudes to approach challenges, but this situation was remarkably successful. The work was completed with a positive attitude and creativity, and the outcome was outstanding. A remarkable challenge for a student ends up turning into an empowering opportunity enacting problem-solving skills.
Through the process there are some discomforts in and between participants, Somerville and Perkins (2003, p. 253) states, ‘the discomfort zone of cultural contact is usefully conceived as an area of productive tension in which differences can generate hybrid outcomes’, as well as the personal and professional development in participants, overcoming challenges make people acquire self-confidence in decision making, being empowered and self-determinate. A remarkable challenge that ends up in opportunity.

Figure 88. Pot with art

Figure 89. Teacher supporting student
Problem-solving

One of the girls had a mistake while painting in her project and she needed to paint the pot again. She needed to wait until the pot dried and she was bored with waiting and suddenly with an idea, she solved the problem by drying her pot with a hair dryer in 5 minutes instead of waiting for a longer time (see Figure 91). Even though a hair dryer can be seen as not promoting sustainability, the student improvised with the Indigenous and western elements she had in Place, hybridising elements, epistemologies and knowledge.
Another example, the dreamcatcher team finished the first dreamcatcher with material provided by the researcher. After that, they started a new one with natural resources found on the land. The girls and the researcher went to find branches to do the base of the dreamcatcher. At the beginning, they found dry branches, and tried to do the circle base but they broke or cracked. They realise that raw branches can adapt better to the shape and can dry in the position wanted. In this case the girls were solving problems with creativity, acquiring knowledge and learning from nature, experimenting and developing expertise. Even though they are off-Country, their relationality with Place is strong as they live there, and they build a relatedness with the natural environment they are connected with in that moment of collecting natural materials.

- **Empowerment, self-determination, agency**

In the beginning of the project one student wanted to be a waitress in a café and after finishing the project, she wanted to have her own business in the future:
‘I really enjoy doing the project with you and it’s clear for what I want to do in my business for the future. Also, I have fun painting frames and working with you. I hope we could do it next year again.’ (Student 10)

From a small idea to a big idea, CCoD gave her the opportunity to explore her knowledge and skills, and open horizons and opportunities in her life. She demonstrated her own agency to thinking beyond her design to future career prospects. Embedded in these decisions are notions of empowerment and self-determination, and these are qualities that will assist IYW in pursuing employment after secondary school, and in developing an Indigenous entrepreneurial attitude toward developing her own business. The student was developing the practices of self-reflection about the importance of her culture and the quality of the product design with respect to potential purchasers of her biocultural project.

CCoD opened up ways and opportunities to see knowledge and practices with other approaches, which work within the educational context and for participants’ futures.

- **New opportunities, discovering professions and new skills**

In one session, the researcher was taking photographs of all the biocultural products finished to put them in the final presentation for the stimulated recall activity. One of the Indigenous girls came to see how the researcher was taking the pictures, she was very interested in learning how to take pictures of the finished products. The researcher explained exposure, light, exploring zoom, perspective and composition to the student and the student took almost all the pictures of the products (see Figure 92). She told the
researcher that she wants to study photography as a result of collaborating with her taking pictures, she enjoyed learning about techniques and how to take these particular kinds of pictures of products. She realised she liked taking pictures of the design products, and she wanted to study something related to photography and tourism. CCoD opens professional possibilities and gives opportunities to discover activities and skills not previously explored (she told the researcher she mainly takes selfie pictures) or enhance the innate ones.

Figure 92. Researcher explaining the techniques to take pictures
5. Limitations of CCoD methodology

In the observation, interviews and yarning, I detected diverse concerns within the community and school environment. Such as loss of language, legends, customs and cultural identity in old and new generations even though the adolescents find their identity within their culture. Some threats that are affecting the transferability of Indigenous knowledges in the community is the embarrassment of their culture in some adolescents, lack of communication and teamwork in education, selfishness and pride, lack of follow up with Indigenous projects, lack of integrity in the educational plan in school.

These themes explore the tensions and limitations of CCoD that are explained in this section. It is important to mention that this research involves a bottom-up approach which includes agents of change and transformation for the benefit of everyone involved, individuals and organisations. It can also involve limitations found in negative evidence patterns during the process (Huberman et al., 2013). So, the limitations and tensions related to four categories:

1. Place
2. Pedagogic settings
3. Human agency factors
4. Power relations

Place

The limitations found in Place are related to the relationality between people and Country, and to time and space. The requirement of the connection of people and Country in the
CCoD methodology means that CCoD is designed for communities and Indigenous settings that are in contact with local resources and land. *Mexican Teacher 1* - ‘CCoD is for communities not for cities because it considers people and land.’ In the Mexican context as teacher 1 articulates, there is a significant distinction between living on Indigenous communities than the cities, where there is not proximity to cultural practices and connection to land.

The main limitations in the negotiation were time, place and how to fit into the educational program. Time needed to be negotiated as the projects were flexible to the times of the school and the specific class. Place was negotiated because it depends on the possibilities and availability on Country, in the Aboriginal boarding high school, to fit in the school program, and the flexibility in fitting in a subject decided by the institution in the classroom. In order to mitigate this inconvenience of researching on schools, the researcher ensured that the project was only conducted at a time and place deemed suitable by the Indigenous school.

Within the conception of Place, time restriction is seen as a great limitation in CCoD. While this research is time limited because of deadlines within the PhD program (4 years) and within the school program (terms), it is important to promote and encourage students to keep designing and producing biocultural products and services on their own and in collaboration with other people from other cultures and from the western society. With the tangible outcomes, the students and the teacher implied there was a need for more time. According to Australian teacher 1 it would be interesting to keep running this workshop to see how the girls connect each time. *‘It will be interesting to see if running the workshop as a second time, they would be faster to connect, to knowing what the outcomes go.’* An
alternative is doing CCoD as part of the program of the school to acquire more experience and achieve enhanced quality in the biocultural projects, as well as to bring more control and confidence in what they were doing over the co-design process.

The challenge of the CCoD was to keep work in this Biocultural Workshop as a normal part of the curriculum of the school, so as not to be dependent on a random researcher arriving at the school. The girls were very keen to develop the project in their communities. It is important to boost their interest to apply these projects that can empower other people, not only in a school environment. One of the challenges in the CCoD methodology was the lack of evidence as to whether the girls applied any aspect of the project in their communities to enhance their personal and possibly their future professional life. A teacher expressed concern in the follow-up of the project, that, if there is no continuity, then the project and knowledge can disappear:

‘There have been projects but very isolated, there is not a follow up or continuity to keep going. I think that is there not a follow or constancy, you lose it. It is like culture, if you do not pass it to the next generation and practice it all the time, you lose it.’ (Mexican Teacher 4)

The teachers in Australia thought that the lack of time was a limitation with respect to the resourcing available in the school environment and the deadline imposed on the project by the researcher. The teacher also expressed interest in running CCoD a second time with the Indigenous students to see if they would connect with the process faster compared to the first time. Australian Teacher 1 stated:
‘The main limitation is time, as by the time they found they were into the project, they realised that the deadline was coming faster towards the end of the project, so being able to have them participating, that was really good, and it’s good to see that everybody started to get more involved with the project, it will be interesting to see if running a second time they would be faster to connect, to knowing what the outcomes go, so that’s also that we were looking to then as well later on.’

Two teachers expressed that with more time the projects could be more refined, and the girls could develop more agency as they take control of their actions. Australian Teacher 3 stated:

‘More time more refinement’ ‘Yeah, I think with more time they take more control of what they are doing’.

A teacher suggested that CCoD can give agency to IYW. With enough time and continuity in the project the girls would have more opportunities to take control throughout the project:

‘I will be intrigued to know how that go if it’s a regular aspect of their work, it really be fascinating to say that I come out until the end... I could imagine that they continue it on, kind of, the teaches could step back more and could the girls could start working and supporting one another and taking control of that’. (Australian Teacher 3)
This suggests that time is a need to keep practising to possibly acquire control and agency of the design process and outcomes and in this research, time is limited as it should fit in the PhD program.

**Pedagogic settings**

This section discusses the lack of attention and action from the educational system to incorporate Indigenous ways of knowing, and the limitation of understanding of the potential of CCoD among teachers.

**No program for state/ country**

According to the researcher’s observations and the analysis of the curricula in schools in Australia and Mexico, there is a lack of interest and understanding by the government, educational systems and social systems about Indigenous culture and knowledge. In many countries, Indigenous culture and knowledge are not a priority, and in many cases government decisions are linked to educational systems according to the country’s development goals. Despite this there are some action plans and protocols for Indigenous peoples and knowledge conservation (see Chapter 2). The educational, social and political systems are still generally governed by western ontology and Indigenous peoples are oppressed by these power relations (Freire, 1970, 1973), in 2019 this is still the case.

An example of introduced western worldview that affect Indigenous knowledge dissemination in Ixtlan de Juarez, Oaxaca is explained in a yarning with Mexican teacher 2:
'Ixtlan was well known as agricultural, clay and ceramics community but nowadays there is only one elder woman that make ceramics. Handicrafts have been losing because a historic change. The field and agriculture and handicrafts were the main income from the community, but handicrafts take lots of time to go to look for the soil, clay, then mix and design the form, then cook it, etc. In the 70’s the forestall enterprise arrived and promise the people that with less time of work they could generate more income and resources, that was a social grow but in a long term that is ending up with the customs and ancestral knowledge. The people from the community prefer easy work well paid than ancestral knowledge, they did not know the importance of their own knowledge.’

In the aim to conserve and recover biocultural diversity in this research, CCoD focuses on Indigenous communities and the recognition of their IEK and practices when connecting people and Place on Indigenous land, even though the participants are off-Country. A teacher states that a limitation for CCoD is that it cannot be applied in cities and that this can prevent its introduction as part of the federal curriculum. Mexican teacher 1 – ‘I think CCoD is for communities not for cities because it considers people and land. It can be intern at the school but would be better if were federal or state level. I can see it difficult but not impossible.’

Indigenous communities should have different programs to the cities and western society, as they have their own knowledge that should be preserved according to the Country, even between communities the subjects should change according to the Indigenous knowledge and Place. Indigenous schools and schools in communities should base part of the program to conserve and regenerate their biocultural diversity and knowledge, such as in the Aboriginal College. Thus, there would be limitations to introducing CCoD in a state
educational program where curriculum accountabilities are more prescriptive and controlled.

In some Indigenous schools not all the students are Indigenous. A challenge can be on how non-Indigenous students, can work within an Indigenous project. How non-Indigenous people involved in the Indigenous program can participate and give insights within the community and culture to collaborate together. CCoD gives the possibility to explore and learn together respecting diverse ontologies and point of views.

**Teachers do not know how to link CCoD to the subjects**

Even though teachers understood the theory and importance of the CCoD, some teachers did not know in the beginning how to link it with the school program and subjects. There should be a strong description of the methodology to explain to teachers and heads of school how to practise it and associate it to the school program. Another limitation is that researchers who are not teachers do not know the federal curriculum, in this case the Australian Curriculum. CCoD practitioners and researchers need to have a better grasp of curriculum to do this mapping.

The presentation with the outcomes from another community (see past researcher’s investigation (Ibinarriaga, 2014)) in another country helps to explain possible outcomes, where the outcomes were different according to the community, culture, environment, resources and people involved. This can be associated with teachers having a lack of creativity and imagination towards a CCoD project. In evidence of this, the researcher asked the Mexican teachers: ‘Would you apply this methodology to your students? Why?’
Mexican teacher 2 answered that the CCoD could be good for strengthening local cultural identity which is one of the intentions of this methodology but it was difficult for her to place the CCoD in the school educational plan, and that could be a limitation to implementing the CCoD: ‘Yes, it is good for strengthening local cultural identity. Learn about history, how our ancestors solved problems. I just see as a challenge how to insert CCoD in the educational plan, with which focus?’

Mexican teacher 5 would like to try the methodology: ‘I do not know, I would like to try and see what happens.’ Mexican Teacher 3 stated that other projects to encourage Indigenous knowledge have been implemented at the school to have a more integral educational plan: ‘These projects have been done to link all the subjects in school, to be more integral.’

In a traditional educational program in Mexico, CCoD can be seen as an alternative subject to relax and develop motor functions. Mexican Teacher 1 - ‘CCoD can fit in arts adorned with another focus but with the same essence. Like complementary activity as an optative subject.’

Mexican Teacher 2 - ‘The only limitation is that is only one hour per week, is not much time.’ This can be seen as a limitation but it can also be seen as benefit and incentive for students to enjoy while learning, exploring and conserving Indigenous knowledge. Mexican Teacher 1 stated ‘CCoD can be used to replace for missing topics and activities that promote culture, environmental care and motor functions. A subject to enjoy and relax.’ In an Indigenous educational program, CCoD is seen as a methodology that may support, through action and knowledge production, essential personal development for
students. As the teachers’ comments suggest, CCoD projects like the one conducted in this research are perhaps considered to be subjects ‘to enjoy’, and for helping students ‘relax’. The potential for self-development and cultural awareness can be of paramount importance when privileging Indigenous knowledge and education in institutions and as a way of decolonizing curriculum, as required by the Australian Curriculum.

In understanding the applicability of CCoD, according to teacher 2 in Australia, the difficulty to forging relationships and to understand the concept and the outcomes in co-design can be difficult if there are no examples of other projects:

‘In terms of limitations I imagine that, it depends on help others to open to the whole concept, a lot of schools often... most of the Ph. D. students, come in and want to know very definitely what the project would be about, and you gave really good examples based on your previous research, but I think some schools may not be necessary open to the concept of co-design they want and have it a very prescriptive, and very detail, and yeah I think that is the only limitation that I can see.’

As mentioned above, the teacher also saw limitation as some schools may not necessarily be open to the concept of co-design, as they want a very prescriptive, and detailed program imparted by the teacher. CCoD is different with its mutual learning and collaboration process with the people involved in the methodology, where there is a facilitator but not an instructor: ‘A limitation can be the approach the researcher to the school, it’s about forging the relationship between the researcher and the school that allowed the project to happen effectively. Sometimes in school it’s a busy environment and they want to just come
The building of relationships and negotiation with the school and participants, as well as the possible mutual benefits for participants, allows CCoD to be embraced by the school and to be implemented within the school program with respect as a possible beneficious process for students.

**Educational intersection of knowledges**

In a multicultural setting, it is difficult to understand and decide when to privilege Indigenous and non-Indigenous knowledge systems, because discourses of power relations and cultural identity can bias the results of the decision. Ideally, schools should have Indigenous and non-Indigenous teachers and staff to balance the knowledge systems.

In most schools, non-Indigenous teachers have limited understandings of Indigenous knowledges and languages as generally they do not have contact with it in their lives. This can lead to students and teachers experiencing continued stereotypes and to the perpetuation of colonial practices and power relations (Auld, Dyer, & Charles, 2016). This is one of the difficulties when working with Indigenous and non-Indigenous peoples in schools. Even the teachers in the Aboriginal College have studied about Aboriginal culture and have preparation in these settings that leads to Closing the Gap (Altman, 2009) to break colonial practices. They were not Aboriginal, so even though the gap is diminished, there is still a risk of continuing with possible colonised practices.
Human agency factors

Diverse human factors related to lack of agency and cultural identity for Indigenous youth, lack of Indigenous teachers in schools, language and communication barriers, a range of personal adverse life factors, and poor technology, can affect and limit the outcomes of CCoD.

Lack of recognition of Indigenous cultural identity

Lack of acceptance of Indigenous cultural identity might threaten the CCoD process as the methodology encourages the use of Indigenous knowledges epistemologies in schools and in collaboration with academia. During the research in Mexico, I realised that one of the critical limitations of recovery and regeneration of Indigenous knowledge systems is the lack of cultural identity and different criteria of sense of belonging in Indigenous peoples. Many Indigenous peoples are ashamed of their culture because in some point of their lives they have been subjected to marginalisation, racism, punishment, work disadvantage, fewer opportunities to grow outside of their communities in many cases. These events promote the loss of cultural identity and pride in ethnicity. For instance, two teachers in Mexico pointed out that in Oaxaca many children stop talking the community language (Zapotec or Mixe) and many are losing cultural identity as currently there are few teachers who educate in the community language as part of the school program because of the introduction of federal programs and colonisation. Spanish is the official language in Mexico. Teacher 5 - ‘Spanish had seen as an advance in society and that is why children stop talking language. Even though nowadays there are some teachers in some schools who teach language like Zapotec.’ Teacher 1 - ‘Children are more isolated
nowadays. The children that are Mixes wear Indigenous clothes and speak languages, but some from other communities lost the knowledge and identity.’

The teacher also indicated that after colonisation, Indigenous people were prevented from speaking their mother language as part of marginalisation:

‘In the 40’s and 50’s people were grounded if they spoke Indigenous language. Thus, new generations, take language as a sign of marginalisation and they are not interested anymore. Western people made laugh on them because they spoke Zapotec and they could not speak Spanish very well. Nowadays there are just a few adolescents who speak Zapotec.’ (Mexican Teacher 5)

Teacher 5 stated that in one stage of his life ‘I denied my Indigeneity in the city as I thought it was an obstacle to apply for a job’ because he was discriminated for being Indigenous. In the job he was applying for, one person told him that he was ‘Oaxaco’, that is a pejorative term in Oaxaca, he felt the misprize from that person.

**Researcher factor**

The researcher’s ontology shapes the methodology as it is based on her point of view, respect, collaboration, experience and finding the gap that is important to address. This ontological approach can be a limitation if the researcher/designer does not have certain skills such as being respectful in all the process with all participants involved. The researcher needs to develop the understanding of intercultural collaboration, the diversity
of knowledges and processes, the capacity for mutual learning and flexibility in ways of communication.

I became aware that all participants had a nuanced vision, giving the research scope to explore the diversity of values, perspectives and direction, which were wrapped up in their ontologies and epistemologies. I attempted to consider and learn the diverse points of views from the participants, to complement the methodology and fit it in different Indigenous environments. It can be challenging to document a methodology following the feelings and experiences from the participants’ perspectives but a two-way approach to learning can support an understanding in different settings.

A teacher stated that the researcher’s non-traditional place-based analytical approach was very respectful with a suitable balance between teaching and learning, and focussing mainly on collaborative interactions rather than the standard qualitative researchers’ approach. Australian teacher 2 stated:

'\textit{It is a very different research, and I think that’s because the research design but is also how you Desiree work with us and the students. You have a very very respectful approach, you are here as very much to learn, as much as to share what you have. You are not coming in to say, I know about this, and I’m going to be researching in that, you are not being doing this analytical approach, you are really much about collaboration. So that is the enormous difference.}'

This was a positive statement but it can be a limitation for CCoD if another facilitator does not have the same type of approach.
Language and communication barriers

The limitations that this research and the CCoD confront is in communication when spreading the knowledge and methodology to participants. Western scientist’s language makes it difficult for Indigenous peoples to communicate effectively with western scientists and vice versa in most cases. Western scientists use complex and obscure language, as academia demands this linguistic style, which often makes the message unclear. The message should be concise, clear and in an approachable language to acquire mutual understanding for both sides. There is a needless complexity of language in academia when spreading new knowledge to the world, this should change in order to make knowledge accessible and understandable.

As an international PhD student doing my research and developing a new methodology (CCoD) in a second language, I had to overcome many challenges to master a different structure, grammar, way of thinking and explaining ideas. On top of that I had to adapt to a different academic language and master its complexity in a short amount of time to be able to meet deadlines. In the three years of my PhD journey, I was immersed in a different academic language, but it was difficult to fully master the complex academic structures to be able to express my ideas while complying to the protocols.

In this CCoD experience through the Biocultural Workshop, in many cases, IYW spoke two or three languages, and the one used in the school was not the mother language. For instance, in Australia the language at the school was English and in Mexico it was Spanish. As a result, the communication between IYW, teachers and researcher, can be difficult if
it is not encouraged in other ways such as body language, translation, written expression, through design and arts.

During the Biocultural Workshop, English was not the first language for the students and the researcher, which limited everyone’s ability to fully express their ideas, the advantage is that it helped to break barriers and to innovate in forms of communication. The language barrier can be a limitation in the CCoD process and in the concept learning for participants.

**Commitment**

Most of the students were committed with the project however there was not always the desirable engagement of each participant involved from the beginning of the Biocultural Workshop. Each person is interested in different parts of the process, or has diverse interest, as well as trust and connection with the researcher and teachers. In this case, the project cannot happen if the head of school does not agree or is not interested, the teachers have different interests or vision of education, and students are not interested or committed.

The researchers’ job can be difficult to achieve so the researcher should be patient, committed, perseverant, loyal, overcome challenges for and with others, creative and maintain the interest in the project with participants. The researcher should have specific features, values, and attitudes to lead the methodology successfully and that can be a limitation to achieve the goals, as not all researchers/designers have these values, interests and skills. Before and during the CCoD methodology a lack of interest, motivation, time, disposition, communication and teamwork from the participants can affect the outcomes and the project completion, leading to the project having few benefits. During the project
there should be encouragement of all these elements to achieve the goals and benefits for all the participants.

There are different conditions and life factors that can affect the Biocultural Workshop completion in CCoD. These complications can be: weather conditions that affect the mood and attendance of the participants, negotiation and acceptance of the time and effort required to acquire confidence, lack of patience, and sorry business. School and personal matters should be taken into consideration in CCoD, and there should be acceptance that not all the participants will be able to finish the project and have the desired outcomes. As mentioned in Chapter 3, absences or student non-attendance can affect the girls’ outcomes, process and cause reduced success in the goals proposed in the beginning of the project, as they do not finish the project. Participants can drop the Biocultural Workshop due to different causes for example, some girls may have personal and familiar matters and drop the project or miss the session(s) that impacted on their outcomes. This is a limitation for CCoD as it is not controllable and does not depend on the methodology.

**Power relations**

Power relations are ‘socially and historically constituted and are implicit in the reproduction of systems of class, race and gender oppression’ (Kincheloe & McLaren, 1994, p. 140). Even though the methodology is designed to breaking the power relations and hierarchical structures, it still happens but at a diminished level. It is fundamental to understand how power relations between participants (teachers, students, researcher) limit the CCoD but also how CCoD can contribute to manage the power relations in order to
weaken them, using decolonizing approaches that are based on mutual learning and understanding helped to decrease power relations between participants.

CCoD cannot completely avoid power relations. It distributes control and authority through collaboration, guidance and support through the process, instead of dictating or instructing. It seems that the researcher/designer actively relinquishes control and authority throughout the process, the hierarchical power relation between researcher, teachers and participants is redirected towards collaboration. There is also the possibility to reduce the power differential, as the participants support and help each other, and take control of their own projects.

Even though the researcher should be seen as a peer in the project, an Australian teacher suggested that there are unequal relationships as the researcher is proposing and facilitating the CCoD methodology, even though throughout the process the participants give insights into the project:

‘... the students need and required some direction to achieve empowerment and self-determination. The students need a bit of support and direction and in getting started in understanding what they are doing. I could imagine that they continue it on, kind of the teachers could step back more, and the girls could start working and supporting one another and taking control of that.’ (Australian Teacher 3)

In the Australian site, it was really important to have a risk management strategy in the project design that was controlled by the partner organisation and was essential for the CCoD methodology, reassuring that everyone has agency and power of the project.
Another type of power relation that can limit the CCoD is teacher-teacher power relations. In analysing the Mexican interviews, the teachers had the intention of trying projects to promote Indigenous knowledge. Despite the optimistic intention, they knew that there was a problem in following up the project and the lack of teamwork among teachers to perform or practice in a regular routine. Supporting this analysis with evidence Mexican Teacher 5 stated that: ‘The problem is the lack of time, disposition, communication and teamwork. The problem is pride and selfishness of who made the plan or who has the acknowledgment for the project.’ The limitation on this is that CCoD can be seen as an individual project if there is no follow up from the organisation or community.

Another barrier is when the teachers do not want to give up the power that is obtained when they are acknowledged because of pride and selfishness. Generally, in schools, the teachers work individually, and the way of teaching is different depending on the teacher background, values and interests. Most of the teachers in Mexico agreed that teachers can be egocentric, and this had implications for projects involving Indigenous knowledges. A teacher from Mexico stated that teachers reject projects or do not participate fully in the project if it is not their idea or it has not been negotiated with them. Selfishness and self-acknowledgement are present in this school and in many others according to the Mexican teachers. One solution to this problem is to introduce subjects related to Indigenous culture, and either teachers work together towards an aim, or teachers work individually with the students in diverse projects. CCoD gives the opportunity to the teachers to work together collaboratively and with the students giving insights to the project or idea, all equally. CCoD cannot work efficiently if the teachers do not want to give control to other participants (other teachers, researcher and students).
The limitations of CCoD methodology according to the fieldwork notes are that teachers do not know how to link it to the subjects in the program school at the beginning. Lack of creativity and imagination, pride and selfishness (difficulty working as a team), lack of time and disposition, and people not thinking and performing means many projects cannot be accomplished because of lack of commitment, patience, communication, vision and action at the same time.

The themes unpacked above support, with evidence from all participants involved, the onto-epistemological constructs of the CCoD. The relationality between identity, Place, human agency, interactions and collaboration and method (Biocultural Workshop) are formed at a deeper onto-epistemological level in the next section to conclude this chapter. This amalgamation is premised in and by an Indigenous worldview, my own.

**Critical Co-Design methodology: The Theory**

The most significant outcome of this research is the CCoD methodology. This research is unique as it introduces CCoD as a new methodology that has been informed by research and supported by empirical evidence and theoretical concepts, responding to the main research question: What are the elements, epistemologies, ontologies and discourse of an effective Critical Co-Design methodology that privileges and empowers Indigenous young women (IYW)?

As part of the analysis of this chapter, evidence and findings inform the new theory underpinning the CCoD methodology, through the last chronological phase of data
analysis: Creating conceptual and theoretical coherence to support and present the CCoD Methodology theory. Here, I present the theory of CCoD methodology that draws on the data presented above and in Chapters 3 and 4, and literature presented in Chapter 2. I reveal the onto-epistemology of CCoD, the *Fourteen Axiological Tenets* informed by literature, data and the themes found in the analysis. Finally, I present the method developed and designed to enact the methodology, the Biocultural Workshop.

As mentioned in Chapter 2, Critical Co-Design does not currently exist as an official term in academia. In this research I introduce the term as a new methodology for Indigenous partnership, denoting the collaboration of Indigenous peoples and, in particular, IYW, with researchers and designers. This methodology is proposed to be transferrable in terms of the process of collaborative design but generating different outcomes being specific to each context, not only with IYW in a high school environment but in diverse contexts while collaborating with Indigenous peoples and communities around the world, while acknowledging relatedness in Place.

CCoD addresses a gap in the co-design literature by introducing the importance of relatedness (Martin & Mirrabooka, 2003) and agency of all things (Martin, 2017), positionality and cultural identity while collaborating on Country (Martin, 2017), research as Ceremony (Wilson, 2008), while collaborating in Place (Graham, 2006). Place is the key element here, as it refers not just to physical Country but to a time in place and space.

Within this framework, this research incorporates the perspectives of IYW and the researcher/designer, privileging and empowering IYW’s knowledge and culture in an institutional environment within an Indigenous Country. CCoD, in this context, acts as a
bottom-up methodology aimed at a process of thriving, despite the subjugation and oppression of Indigenous peoples through colonisation and globalisation. This approach was developed through my reality of being an Indigenous mestiza social designer and researcher, observing and collaborating with Indigenous peoples in Mexico, Australia and Taiwan for over seven years. This research also addresses and attends to a gap within design literature, in which collaborative decolonizing approaches have not been used or considered while collaborating with IYW. CCoD addresses this omission, informed by my position as an Indigenous researcher and practitioner of co-design.

As mentioned in Chapter 2, CCoD critiques the traditional conceptions of co-design and co-designers, and discusses how the design approach can contribute to overcome these limitations through CCoD in collaboration with Indigenous peoples. While co-design proposes collaborative practices and describes the way people work together, CCoD methodology proposes a new collaborative theory and practice focused on the conservation of Indigenous peoples and knowledges, besides describing the nature of the challenge and the gap that is being attended to.

**The Onto-Epistemology of Critical Co-Design**

This section presents the CCoD methodology theory introducing fundamental definitions, giving an overview of the importance to consider Indigenous peoples onto-epistemologies in the design field, the importance of Indigenous representation in the design field, explaining the methodology as a bottom up approach founded in decolonizing methodologies, the transformation in the role of designers and researchers and presenting challenges of the CCoD.
CCoD methodology

This research places the constructs of CCoD based on the consideration of Indigenous and researchers/designers’ perspectives co-designing together through pragmatic experimentation, recognising and privileging Indigenous peoples´ onto-epistemologies and wisdom towards cultural identity pride through positionality (Martin, 2017), collaborative resilience (found in this research), and biocultural diversity conservation and regeneration (Maffi & Woodley, 2012).

CCoD supports Indigenous people and researchers/designers to produce a flow of new knowledge together, co-designing biocultural projects through respectful intersection of ways of knowing through different ways of communication such as observing, listening, reflecting, observing body language, understanding in a mutual learning process, overcoming challenges with empathy, and compassion and flexibility in a physical space that acknowledges people and place.

CCoD integrates elements of Indigenous methodologies, critical theory and co-design. CCoD responds to critical theory that attends to gender, race, decolonization, relatedness, Place, education and critical thinking approaches, addressing cultural identity pride, empowerment, self-determination and decolonizing research. For Uncle Charles Moran et al. (2018, p. 75) ‘decolonizing social design commences with the interactions that result from building relationships with knowledge outside the human mind because Knowledge lives in Country and has partnered with humans since the beginning’. Through these approaches, CCoD privileges IYW’s onto-epistemologies, understanding the importance

The Ways of Being, Knowing, Doing (Martin & Mirraboopa, 2003) and becoming (Country et al., 2016) and the dynamics of Place (Graham, 2006) underpin the relationality between Critical Co-Design, Indigenous Ecological Knowledge, research content and methodology. CCoD is looking to recognise and understand the way of becoming of Indigenous peoples while collaborating with researchers and designers, through a respectful, holistic, cyclic, reflexive and collaborative methodology through co-design. CCoD incorporates Indigenous onto-epistemologies (ways of being, knowing and doing) and the notion of Place offering a co-becoming in a relational world (Country et al., 2016). ‘Space/Place is its doings, its beings, its knowings, its co-becomings.’ CCoD respects the diversity of ontologies and epistemologies involved in the project by privileging Indigenous onto-epistemologies. Through CCoD is the attempt to understand and observe other points of view within the Indigenous context of co-designing and co-developing practical environmental solutions together developing capacity building. CCoD emphasises the importance of recognising ontological and epistemological pluralism through the field of co-design. Thus, CCoD enables researchers to comprehend how people create, develop and think differently about environmental opportunities, challenges, and problems, as well as how they understand processes, issues and concepts.

**Fundamental definitions for CCoD**

To understand CCoD it is essential to understand the meaning and significance of onto-epistemologies as relational. Relatedness is how all entities interconnect with each other,
how the ways of knowing, being and doing are part of one component, and how the material and immaterial are inextricably interrelated.

Barad (2003, p. 18) describes onto-epistemology as ‘The separation of epistemology from ontology is a reverberation of a metaphysics that assumes an inherent difference between human and nonhuman, subject and object, mind and body, matter and discourse.’ Supporting this construct of onto-epistemology Martin (2017, p. 10) states, ‘In all Indigenous accounts Country, people, entities, kin and knowing is not passive. What an Indigenous approach to research offers is one that does not limit itself to a linear separation.’ For CCoD, onto-epistemology refers to the non-separation or relationality between the ways of being, knowing, doing and becoming within Indigenous approaches, as well as the human and nonhuman relationship. The fundamental relationality between ontology, epistemology, methodology (Martin & Mirra疱opa, 2003) and ethics (Hoffman, 2013) are necessary conditions for onto-epistemology constructs in Indigenous worldviews.

**Indigenous peoples onto-epistemologies recognition**

To understand CCoD, it is important to recognise Indigenous onto-epistemologies and worldviews and the relatedness within Place. As mentioned in Chapter 2, most of Indigenous peoples’ ontologies view the world as a unit, which means that people, environment and cosmos are interconnected (Hsu et al., 2014). They co-exist physically and spiritually with reciprocity, all living and non-living things are sacred and must live in harmony (Hart, 2010; Holmes & Jampijinpa, 2013). Indigenous onto-epistemologies can influence the development of knowledge and practice in design. CCoD relates to Place
and Country that continue to shape interactions and understandings as a way of co-
becoming.

This research is focused on the regeneration and conservation of IEK and biocultural
diversity though the design field proposing CCoD as a way of becoming. Indigenous onto-
epistemological worldviews are holistic and intuitive understandings of the world (Coates
et al., 2006; Weir, 2012). Additionally, Indigenous peoples are promoting collective
responsibility, individual integrity, respect, reciprocity, harmony with nature, genuine
relationships that lie in the heart of community, life and community development
(Tuhiwai Smith, 2012; United Nations, 2009). Indigenous worldviews are a fundamental
basis of CCoD, it aims to share the understanding that Country means a unity, not only as
nature. McKnight (2015, p. 278) argues that ‘Western dualism replaces Country with
nature in a negative and subjugated sphere’ but all the Entities have correlation in the
place. CCoD supports some aspects of plurality and Indigenous subjectivities but does not
attempt to define Indigenous worldviews or cover all of ideas contained in them, neither
tackle all problems of the colonial world.

CCoD enables Indigenous peoples to represent their identities, desires, needs, interests,
knowledge, values and privileges Indigenous’ worldviews among academia within real
context. According to the data in Chapter 4 and 5, individual and collective agency is
further enhanced and/or developed through the CCoD process. The data has shown that
through CCoD, IYW can harness their skills and knowledge, grow their confidence and
self-esteem about their Indigenous cultural identity and the use of their knowledges. After
the students chose to participate in the research, they were not pressured to take part in the
Biocultural Workshop if they did not want to, or if they were opposed to some element/s
of the process. By affording the participants the opportunity to debate, dispute and be critical of the system and the process of the Biocultural Workshop, this methodology opens up the space for both individual agency and collaborative and community cohesion as part of the decolonizing approach of the CCoD. This strategy is key to the disruption of existing hierarchical power relations by opening up a space for students to exercise their free will to collaborate.

Collaborating together towards biocultural conservation is fundamental as Indigenous peoples are best placed in knowledge about Country and the environment due to the implicit nature of IEK, as IEK belongs to specific ecosystems and culture. Research from a non-Indigenous perspective tends to study opportunities, challenges and problems recognising diversity of methods and methodologies while research from an Indigenous perspective tends to recognise the richness of diversity and the interconnectedness between Entities on their Country.

**Indigenous and non-Indigenous worldviews challenges**

McGregor (2005), an Indigenous scholar, discusses the dichotomy of Traditional Ecological Knowledge (TEK) or as I call it in this thesis, IEK in Indigenous and academic points of view. She struggles with the possibility of reconciling Indigenous and non-Indigenous perspectives in the IEK field. The most remarkable difference she found is that Indigenous peoples live the environmental practices which scholars called TEK, while western or non-Indigenous academics only study it but not practice it, in most cases. Another difference is the epistemology of knowledge. Knowledge is not just disseminated but is built day by day (Dale & Hyslop-Margison, 2010; Freire, 1978; Toledo & Barrera-
Bassols, 2008), thus, deeper and longer relationships are needed between parts. I would add the lack of communication and misunderstandings between parts as they speak different languages when approaching opportunities and concerns. Hence, as demonstrated in Chapter 4 with the Biocultural Workshop process, knowledge becomes more important when applied.

There are other differences that distinguish non-Indigenous society from Indigenous peoples. In western society, the economy operates independently to the spirit. CCoD intends to combine an economic imperative with a fundamental spiritual connection to Place (land, entities and biocultural diversity). As Pascoe (2014) argues, interconnectedness and spiritual equality of all things, emphasising in sharing and truthfulness. For Indigenous peoples the land does not belong to humans but humans belong to the land, so we need to take care of it, as it is the one that feed us and let us live. On the opposite, for western society there is a combination of joint ownership, or belonging of the land for the utilisation of the resources for their own benefit without limits (Pascoe, 2014).

CCoD is for everyone in Western society who is ready to heal and enjoy and understand the reality of being one with Country. As McKnight (2015, p. 289) states ‘The most important initial step for Country (us) is non-Aboriginal people moving outside the western dualistic mindset with an open mind to form a relationship with Country and Aboriginal people as Country’.

During CCoD, researchers/designers need to switch between their realities and situate themselves in Indigenous realities to live and understand closer Indigenous ways of being,
knowing, doing and possible becoming, being sympathetic and empathetic to their culture and onto-epistemologies. For instance, think and believe that you belong to the land or the house you live in, instead of it belonging to you, and you need to take care of it, in order to survive or live in fruitfulness and with prosperity. Now, feel the connection between the tree closer to you, how it moves and how it affects you or heals you, making you feel relaxed. One day instead of closing your curtains in the house you take care, open it and wake up with the sun and sleep when the sun goes down. Non-Indigenous people may view Indigenous peoples as having a harmonious relationship with nature and possessing an unspoiled spirituality (Weaver, 2001). The CCoD Conceptual Framework allows for non-Indigenous people in general to share an embodied experience with Indigeneity.

As Tuhiwai Smith (2012, p. 226) points out ‘Research is expected to lead to society transformation’. To change to a new way of thinking, among colonisation and globalisation, in new generations of Indigenous peoples, it is critical to develop or retain a love of the Indigenous knowledge - interconnection, culture and language (Tuhiwai Smith, 2012). CCoD is designed to encourage Indigenous cultural identity pride in participants.

While there is complexity in working and collaborating through Indigenous partnership, and this can sometimes lead to drawbacks, such as bias, confusion, misunderstandings about the methodology, goals, and roles of participants, this complex experience can make the research enjoyable and beneficial on so many levels (Adams & Faulkhead, 2012). Indigenous partnership projects need to be collaborative, transparent in the purpose and benefits of the project, and integral in the sense of relationality, while having mutual
benefits. To support the methodological process, *Fourteen Axiological Tenets* have been developed for CCoD, and are explained in the next section.

This methodology can also address the limited understanding and flexibility from non-Indigenous researchers towards Indigenous onto-epistemologies and opportunities. As mentioned above, first, the lack of understanding about the relatedness between humans and nature, people and place and the meaning of IEK in Indigenous ontologies. Second, western academics are predisposed to see nature and culture as different categories, and use methods and methodologies as tenets (Holmes & Jampijinpa, 2013). Third, the complex use of language from western researchers makes it difficult for Indigenous peoples to communicate effectively and vice versa in most cases. As mentioned above, I argue that researchers use complex language as academia demands the use of this terminology, potentially making the message unclear. The message should be concise and clear for everyone to acquire mutual understanding.

**Co-design field: considerations and implications**

CCoD considers Indigenous peoples onto-epistemologies and IEK that co-design has not taken into consideration. As mentioned in Chapter 2, Indigenous methodologies have been used very little in the area of design and co-design. Even though collaboration is a fundamental practice in Indigenous culture, design has been used to ‘help’ Indigenous peoples, but very little has been done to collaborate ‘with’ them. CCoD methodology acknowledges the collaboration and recognition of the importance of Indigenous peoples’ knowledge. In co-design, Indigenous peoples’ concerns and recognition remain at the periphery of the field. This is because the field first started for the development of western
society and to grow companies’ profits, not for biocultural diversity, conservation and Indigenous peoples’ development. In the field of co-design there is limited acknowledgement of and application to Indigenous contexts. CCoD addresses this lack of awareness of IEK and Indigenous ontologies, as the evidence presented in chapters 4 and 5 demonstrated.

CCoD challenges the paradigm of co-design while positioning it as a powerful practice and analysis from which social inequalities and oppressive institutional structures can be unveiled, seeing CCoD as a transforming and thriving process, not as a resistant process. In recent years, much has been written about the role of the designer, how design has been changing, and how it should be done (Badke-Schaub, Roozenburg, & Cardoso, 2010; Björgvinsson, Ehn, & Hillgren, 2012; Lee, 2008; Manzini, 2008). CCoD offers a new role for designers as moving beyond being facilitators and developers, to being enablers, triggers, thinkers and activists. It is about seeing design not only as an accomplished problem-solving process but as a thriving and enjoyable process with real and useful outcomes such as products, services, systems, skill development in the real-world through capacity building in collaboration with Indigenous peoples.

The critical co-designer is seen as a facilitator of successful and respectful Indigenous partnerships. To be effective in their practice, CCoD designers need to cultivate empathy and understanding for Indigenous ways of being, knowing and doing to build multiple ways of becoming together. Designers should be able to switch between the ways of designing they have been trained in, and these ancestral realities, which are most of the times unknown for them. They need the capacity to believe they belong to the land where they live - and to embrace the need to take care of it. For instance, designers need to
connect with the vitality of a tree, not just appreciate its appearance or the use as resource. An ethic of equality, sharing and truthfulness informs the way Indigenous cultures relate to what western society would call biocultural diversity.

Some of the challenges of Indigenous co-design are in the way participants co-create through transdisciplinary and cross-cultural knowledge, and in trying to understand and recognise ontological and epistemological differences. It is important to comprehend how people think, understand and learn opportunities, issues and concepts through integrating IEK and science that challenges western-centric worldviews, power structures and conceptions of time. These challenges are contemplated and addressed in CCoD. Thus, enhancing relationships between Indigenous peoples and academics/researchers (Parsons et al., 2016).

Currently, few studies specifically discuss the ways in which research is conducted and what can be learnt from Indigenous research practices (Kelly & Kennedy, 2016; Parsons et al., 2016). There are also several studies and action plans related to Indigenous women regarding IEK, activism, environmental conservation (Mandaluyong Declaration, 2011; White, 2014), academic dichotomy (McGregor, 2005), responsibilities in their communities (Ugboma, 2014), protocols and problems they face (United Nations, 2013) but very little research on the field of co-design as discussed in Chapter 2. Therefore, this research is focused on IYW while conceptualising CCoD but can be applied in diverse Indigenous contexts. The research methodology lends privilege to the ontological and epistemological worldviews of IYW, through enhancing their cultural identity, skills, creativity, learning and understanding different perspectives and realities.
In this research, the structuralist foundations of co-design intersect with post-structural foundations of CCoD. CCoD considers that co-design has steps to collaborate and follow some structures that facilitate the collaboration. CCoD also contemplates the way of studying how knowledge and capacity building is produced through partnership, which considers diverse ontologies and epistemologies (Indigenous and western approaches), being not only flexible but a respectful methodology. Thus, CCoD emphasises the importance of recognising ontological and epistemological pluralism to comprehend how people create, develop and think differently about environmental opportunities, challenges, and problem-solving, as well to understand processes, issues and concepts together.

**Decolonizing methodology: CCoD as a bottom-up methodology**

CCoD functions as a bottom-up methodology as it emphasises, through positive discourses and actions, the plurality of ontologies and epistemologies and ways of thinking of the participants involved. As bottom-up research methodology, CCoD focusses on the last stage ‘recovery and regeneration of Indigenous’ culture and ecological practices’, within the four general phases of Tuhiwai Smith (2012, p. 91). According to Tuhiwai Smith (2012) philosophy, Indigenous perspectives can be expressed in four general phases since the intervention of the colonisation. First, contact and invasion. Second, genocide and destruction. Third, resistance and survival. Finally, recovery as Indigenous peoples. The problems that came with the intervention of colonisation can be addressed through boosting Indigenous cultural identity pride, empowerment and self-determination, privileging, recognising and harnessing Indigenous peoples’ wisdom and worldviews as a thriving process. CCoD fosters recovery and regeneration of IEK that have been disappearing and/or oppressed during colonisation and capitalism, and
encourages the ways of becoming with Indigenous peoples within the western society, uplifting cultural identity pride, empowerment and self-determination. In CCoD methodology, instead of focussing on problems, the data shows that CCoD enabled the participants to work together to generate opportunities and overcome challenges. Furthermore, design should be taught as a means to harness the complex opportunities in society and nature, with a social positive approach with an environmental development perspective, not only as problem solving (Bernie, 2014; Garduño García, 2017).

CCoD is grounded on decolonizing methodologies and research, seeing it as a bottom-up methodology that I called research for freedom working towards emancipation, based on Freire (1978) theory of education as a form of freedom and design as freedom (Garduño García, 2017). CCoD works as a form of Indigenous freedom, as it facilitates new ways of thinking about research by, with, and for Indigenous peoples, as Tuhiwai Smith (2012) proposed for decolonizing methodologies. Changing paradigms in western research as Indigenous peoples have been, in many ways, oppressed by theory (Tuhiwai Smith, 2012).

As Sandoval et al. (2016, p. 23) states, ‘Decolonizing one’s mind involves sharing one’s knowledges in the academy to nurture Indigenous epistemologies’. Throughout this research, CCoD creates a physical and dialogic space to foster and recognise Indigenous ways of being, knowing, doing and becoming in collaboration with non-Indigenous people. For this, mutual learning, understanding and sharing knowledges are essential, which denotes a process of ‘exchange, generation and integration of existing or newly developing knowledge in different parts of science and society.’ In the mutual learning process both parties do not learn the same way as it is not uniform but enriches the diversity of ideas ensuring easy understanding. Two-way learning embodies an
acceptance of learning about another culture and knowledge systems, while simultaneously sharing one’s own knowledge (Devlin, 2004). These mutual learning and two-way learning approaches are a central part of CCoD epistemology, as through knowledge sharing people understand the uniqueness and importance of one’s culture, this is supported by evidence in this research.

CCoD considers theory as well as practice through the process, helping to ground the constructs and veracity of the CCoD methodology. CCoD has great potential to be a bridge between multiple kinds of knowledge systems, as it not only takes into consideration theory of empowerment, self-determination and leadership but enables pragmatic dialogic space to raise respectful intersection of knowledge bases during the steps of the Biocultural Workshop. For instance, the data showed that during the step of building relationships, the participants developed respectful interactions and trust and, in the co-design, and co-develop steps the IYW acquired empowerment and leadership through the use of their skills and experience. Systemic change requires capability, leadership, support, time, courage, reflexivity, determination and compassion. Or as in Freire (1970) articulation of the relationship of theory, action and reflection, that was evident throughout the Biocultural Workshop and the teachers’ interviews. Additionally, through this research, CCoD endeavours to validate IYW's experiences, epistemologies, integration, spirituality and intuition, which are excluded even from Freire’s critical consciousness dialogue model (Freire, 1973). ‘Integration results from the capacity to adapt oneself to reality plus the critical capacity to make choices and to transform that reality.’
Fourteen Axiological Tenets of CCoD

One of the significant findings of the research is the creation of the *Fourteen Axiological Tenets* of CCoD methodology. These tenets demonstrate the intersection of a multiple range of ways of knowing while respecting Indigenous worldviews. The tenets are chosen knowledgeably, taking into consideration the following: the theory and practice throughout the process of this research, the analysis of Indigenous and co-design methodologies, the data collected during the fieldwork, and the investigation of the relationality between humans, nature, design, schooling, the material and immaterial. All are inextricably interconnected and work together as an integral part to developing optimum and positive collaborations and outcomes for the co-participants.

Derived and informed by the data and evidence in previous chapters and this chapter, *Fourteen Axiological Tenets* were developed to achieve an ethical Indigenous partnership grounded in respectful cohesive collaboration while privileging Indigenous knowledges. These tenets are:

1. **Acknowledge and respect of Place** (Graham, 2006), Country, Indigenous knowledges and peoples (Kennedy et al., 2018), and biocultural diversity.

2. **Understanding and building of relatedness/ relationality** (Martin & Mirraboopa, 2003) and being one with Country, understanding the relationality people, Entities and place, biocultural diversity conservation and regeneration as a shared benefit.

3. Understand and recognise the **material, spirituality and intuition** as one, and the understanding of agency in all ‘things.’ (CCoD acknowledges the spiritual nature
of the self and knowledge, which is an inseparable part in the ways of knowing and doing in the Indigenous world (Hoffman, 2013). CCoD acknowledges humans as physical, mental, emotional and spiritual beings (Bopp & Bopp, 1989).

4. **Understanding of CCoD as Place.** A dialogic and physical space where the collaboration and connections happen. Space as a physical place to apply the methodology and space as a place to dialogue, yarn, discuss, negotiate, exchange knowledges, design, explore, experiment, think and reflect. Between both spaces is the hybridisation of knowledge, cultural contact and intersection of knowledges.

5. **Positionality** (Martin, 2017) and cultural identity pride that is acquired through recognition of uniqueness of Indigenous culture.

6. **Effective communication leading to respectful cohesive collaborative resilience.** Positive and respectful styles of communication should be considered in order to facilitate effective participation, genuine shared vision, clear understanding of the roles and worldviews, needs, opportunities and desires (Goven, Langer, Baker, Ataria, & Leckie, 2015; Lowe, 2011; Stauffacher, Flüeler, Krütli, & Scholz, 2008).

7. **Respectful intersection of ways of knowing.** The respectful intersection happens while sharing knowledge, ontologies and epistemologies in a respectful and reflexive two-way learning environment as fundamental for cross-cultural engagement (Denzin et al., 2008; Porter et al., 2015; Slade, Butt, Rosier, & Perkins, 2015). Mutual learning or two-way learning is a reciprocal process whereby participants learn and teach at the same time through respectful intersection of knowledges (Bartleet et al., 2014; Scholz, 2001).

8. **Critical and reflective thinking** leads to empowerment and consciousness that has revolutionised the way of thinking and doing in education (Freire, 1973). Practise involves critical and reflective thinking as a thriving process of action and reflection to change to transform the type of cognition that society has habituated. Individual reflection and collaborative reflection are important to this process.
9. The **principle of flexibility** to understand and communicate in diverse ways. Firstly, in partner negotiations that discuss risks and benefits for all participants and institutions. Secondly, the schedule and timing to achieve the project (Ertner et al., 2010). Thirdly, between participants in the enactment of the CCoD.

10. **Empathy, compassion and love**, as part of the human element, can be achieved by building relationships, having sensory, smart, exciting, fun and energetic experiences during the process, as well as mutual acknowledgement which is essential to develop empathy (Lam & Suen, 2015).

11. **Overcoming challenges together** is essential. The emotional management and understanding of the positive benefits of rising above a challenge and discomforts is crucial in CCoD. CCoD methodology is designed to overcome practical challenges and discomforts in a respectful way, minimising risks of harm to participants and having ultimately positive benefits and outcomes for all parties involved while favouring Indigenous knowledge.

12. **The sense of membership in a community** is so integrally linked to a sense of identity (Weaver, 2001). Within cultural identity it is expected that non-Indigenous people understand how Indigenous peoples contribute to live harmonious with Country within the western society, so they can co-exist with the duality of western society and preserving the culture while taking care of Country.

13. **Capacity of negotiation with mutual and shared benefits** developing tangible outcomes (biocultural products and services) and intangible or immaterial outcomes (skills and experience), acquiring project ownership and co-leadership, genuine participation and integration (Goven et al., 2015; Kennedy et al., 2018). The pursuit of the project should mutual benefits for all participants involved.

14. Having and **keeping a positive virtuous relationship** during and after the partnership, this positive environment and emotional commitment is of paramount importance to collaboration and project completion.
Biocultural Workshop

An essential process to enact CCoD methodology is the Biocultural Workshop that I designed and developed as a practical contribution for this research (see Chapter 4). This Biocultural Workshop allows the participants to collaborate together through co-design practices. The workshop was designed at the beginning but through the process was refined considering students’ and researcher’s voices. The method of my research and the content of CCoD are intrinsically linked and inseparable.

The Biocultural Workshop method was developed as a complex interrelation of different perspectives of viewing the process (see Chapter 4). There are seven steps in the Biocultural Workshop process from the point of view of the researcher, looking at it in a complex manner when applying the workshop as a step by step process. According to the students’ understanding of the workshop process, there are four stages, considering having different roles than the facilitator/researcher/designer. These four steps facilitate the understanding of the process explained in a simple manner. The Fourteen Axiological Tenets mentioned before sit along this as significant construct of the Biocultural Workshop (see Figure 93).
Figure 93. Biocultural Workshop for students and researcher and the *Fourteen Axiological Tenets*. Written and developed by Desiree Ibinarriaga. Graphic design by Alejandro Guillen
Students’ learnt and understood the Biocultural Workshop in four main steps in relationality with the roles and skills they developed through the process (see Chapter 4).

**Biocultural Workshop for researchers/designers and students**

The Biocultural Workshop process for the researcher was developed through eleven years of expertise of the researcher/designer, informed theoretically and empirically with co-design literature and the fieldwork. The researcher/designer is defined as a scholar with a design background and experience. As previously mentioned, the researcher/designer played diverse roles throughout the Biocultural Workshop according to the data analysed. The researcher/designer can play the role of observer, documenter, guide, facilitator, advisor, support, co-designer, co-developer, listener, negotiator, manager, coordinator, speaker, peer, apprentice, problem solver and trader, playing diverse roles in each stage and depending on the development of the project. These roles can change in each step and stage of the Biocultural Workshop, flowing naturally from one step to the next. The Biocultural Workshop for students is a four-stage process which intersects with the seven steps for the designers/researcher. It is here that the relationality between designers/researcher, students and the *Fourteen Axiological Tenets* occurs.

**Biocultural Workshop process:**

The following summarises the findings related to each step within the Biocultural Workshop (see Figure 93) process and relates to previous information and data in Chapters 2 and 4. As mentioned in Chapter 4, these steps are derived from the data, literature and researcher/designer expertise. It is advised to follow the steps in order, even though they
are non-linear as almost all are developed through the process, and some are iterative. Furthermore, the *Fourteen Axiological Tenets* of CCoD interconnect throughout all the steps and stages for both designers/researcher and students. The outline below shows the steps of the Biocultural Workshop for designers/researchers with the corresponding stages for the Biocultural Workshop for students.

**Step 0. Pre-Project**

The first stage in CCoD is the pre-project when the researcher-designer needs to understand the culture. It is essential to research about the place, resources, entities, culture, practices, laws, ways of being, knowing and doing and possibly becoming. In the second stage, the literature and the diagnosis of opportunities helped the researcher to realise what approach was needed and the possible ways of communication with the community or group involved.

After these two stages, the first respectful contact with the community comes, this meeting is to present the methodology, understand visions, priorities, interests, and aims, as well as negotiate shared benefits and mutual benefits to each part.

**Step 1. Relationship building through mutual learning (Stage 1. Sharing knowledge and culture)**

The data showed that the participants knew each other in a respectful mutual learning process through a sharing and exchanging knowledge and culture from their communities/Countries.
In this step, it is essential to first, observe, to have your own point of view of the community and the participants as an outsider. Then understand the ontology, epistemology and laws among the community, their customs, ways of knowing and doing, forms of communication, interaction and to develop empathy, compassion and understanding of different realities. In this research I addressed this step through reading and learning about different Aboriginal ontologies. I read numerous papers and books by Aboriginal authors and read about the history of Aboriginal society in Australia (Douglas, 2015; Hoffman, 2013; Huggins, 1998; Martin & Mirraboopa, 2003; K. Martin, 2003; Pascoe, 2014). Afterwards, I participated with the IYW in the ‘Caring for Country’ class understanding their realities, interest, forms of communication, and the sense of community among the high school, acquiring empathy and trust. It is important to acknowledge the diversity of onto-epistemologies within Indigenous Countries and peoples. The best way to understand an Indigenous group is to live within the Country and to experience and live that reality by daily interaction with all the entities that co-exist in that place.

**Step 2. Diagnosis of opportunities, interests and needs** (Stage 2. Starting of the project - co-discover)

The participants discussed, in a brainstorming activity, their interests, needs and opportunities that they could harness during the project. The participants were divided in groups according to their interests.

In the diagnosis step, through the experience in present and past research of the researcher, it is recommended to consider first, the researcher’s personal point of view of the opportunities and needs of participants. Then learn the participants’ desires, interests,
opportunities, challenges, resources and needs. Afterwards, understand participants point of view of the same areas, understanding their way of thinking about the opportunities, social matters, laws and interests among the community, as well as the opportunities the participants perceive about their own community or organisation. As an outsider, the perception of the same areas is different and can be either favourable and constructive to the community and participants. Seeing and understanding new ways of developing opportunities and tackling concerns, or understanding and recognising if it is inappropriate and inopportune according to the laws of the community, is essential. It is important to share thoughts, encourage recognition and understandings, in order to develop sensibility and consciousness of diverse ways of thinking. This, in turn, changes both the researcher’s and the participants’ ways of seeing different realities and among the relationality of participants a new reality emerges from the process of co-creation.

Step 3. Co-discovering (Stage 2. Starting of the project - co-discover)

Participants discuss and research about the biocultural projects in a respectful, holistic and flexible manner. Stakeholders search through different resources to investigate ideas, information about the opportunity or concern and challenge it or find the gap in the topic, also searching similar projects around the world or other communities with solutions already developed.

Participants gathered in clusters by interest, and in a respectful way they share interest for that theme, which topics, opportunities and concerns they would like to approach or tackle, and give some creative ideas about the possible solutions. For examples and descriptions of the Biocultural Workshop process in Australia (see Chapter 4).
Step 4. Co-designing (Stage 3. Co-design, experiment and experience)

In an iterative and creative process with co-developing while the participants generate proposals in response to the interests and opportunities in order to create solutions and outcomes. They experiment and acquire experience, practice and quality in the projects. Quality is defined as a constant improvement in the biocultural projects with superior attributes and finishing over the CCoD process.

Step 5. Co-developing (Stage 3. Co-design, experiment and experience)

The participants, IYW and researcher, create and develop physical projects together and individually (stage of materialisation). In this process, time, patience, commitment, creativity, interest, experimentation and passion are elements that should be encouraged to achieve project completion.

Participants experiment with their own already known techniques acquiring self-confidence, they also learn different techniques and explore them to acquire creativity and inspiration. After, they mixed it and experimenting, acquiring originality, innovation and imagination in the outcomes.

Step 6. Presentation of biocultural projects (Stage 4. Project completion)

The projects are exhibited with participants, teachers, family, peers, friends and guests in the school, or it can be among the community or in a gallery. The participants have the opportunity to show their projects, feel pride of their culture and achievements. They also get feedback from other people that were not involved in the process having self-reflection.
This is a key stage of the process as the participants visualise the success through not only project completion but formal exhibition of the biocultural projects as the culmination of the project. The projects can be sold in the exhibition and participants can receive economical reward for their hard work and Indigenous knowledge.

They acquire the skill of project completion, and learn how to trade their projects and explain the meaning and process of the project. In this stage, the participants realise and learn that they can reach their goals even the challenges, harnessing their talent and Indigenous knowledge with tangible and real benefits, both professional and personal.

**Step 7. Self and co-reflective thinking activity (Stage 4. Project completion)**

In a PowerPoint presentation, the participants can see the whole project through each step of the process, as well as the intangible and tangible outcomes. In this activity they can revive, remember and stimulate their feelings, creativity, needs, challenges, struggles, opportunities and achievements. In a critical thinking manner, the participants have a self- and co-reflective moment, they can either write about it or talk in a focus group. Flexibility and freedom of ways of communication and ways to express thoughts is essential to be integral and inclusive.

The seven steps for researchers/designers are different to the four stages above as this workshop is a guided process that should be conducted the certain manner to achieve the intangible and tangible outcomes. The four stages are the perception of the students in relation to the CCoD process.
Summary

In the first section of the chapter, I present the discussion of the themes. The five themes have emerged as essential elements in CCoD during collaboration between IYW, teachers and the researcher. These are:

- Collaborative resilience that includes space, time, flexibility and relationality
- Respectful intersection of knowledge construction
- Human agency that includes cultural identity, relationships and intelligent emotion management
- Outcomes of the participants
- Limitations and considerations of CCoD methodology

In the second section, I introduce the CCoD onto-epistemology theory, the *Fourteen Axiological Tenets* and the Biocultural Workshop as a method to enact the CCoD methodology, these are based on present literature, and evidence based from the research. The onto-epistemology of CCoD is based on the respectful collaboration between IYW and researcher, acknowledging the relationality between people and Place. This, through the co-design field, using pragmatic experimentation co-designing biocultural projects and developing new knowledge, privileging and recognising IYW ways of being, knowing, doing and becoming within a structured institution (high school). CCoD is based on decolonizing methodologies and research towards transformation of the power relations and structures. It is designed as a bottom-up methodology boosting positive attitude and discourses centring in the stage of recovery and regeneration of Indigenous culture and
ecological practices. CCoD aims to enhance or develop empowerment, self-determination and cultural identity pride in participants.

The *Fourteen Axiological Tenets* in CCoD and the Biocultural Workshop guide the virtuous and respectful Indigenous partnership towards collaborative resilience, as well as Indigenous ways of being, knowing, doing and becoming recognition, understanding and respect. The next chapter presents the conclusions of the research by summarising the research, positioning participants, presenting the CCoD Conceptual Framework as a way of becoming, Indigenous design approaches and considerations, further research and finishing with my learning journey.
CHAPTER SIX. CONCLUSIONS AND FURTHER RESEARCH

This chapter focuses on summarizing the research, on positioning the participants and the spaces within the CCoD methodology and on addressing its complexities. Indigenous design and methodology position the findings of CCoD as a way of becoming while recognising and acknowledging relatedness and Place. In this chapter, I use the results discussed in past chapters to respond to the research questions where the findings may be used to create a framework through which to reconfigure education in institutions and in policy development. I also identify the necessary further research, which falls outside this research project. This research not only has the opportunity to make an original contribution to the general knowledge economy, but also transforms lives, including my own - the researcher.

Summary of the Research

The research interconnects four main fields: environment, Indigeneity, co-design and critical theory, presenting a new methodology called Critical Co-Design methodology (CCoD). This methodology (CCoD) is designed to facilitate respectful collaboration and communication between Indigenous peoples and researchers/designers, in this case Indigenous Young Women (IYW) and an Indigenous researcher/designer. The aim of the CCoD methodology is to acknowledge, recognise and privilege relatedness through Indigenous ways of being, knowing, doing (Martin & Mirraboopa, 2003) and becoming (Country et al., 2016), moving towards biocultural diversity conservation and regeneration by recognising Place (Graham, 2006).
The general objective of this research was to conceptualise, explore and articulate the CCoD methodology through a case study. Empirical evidence was collected through the enactment of the Biocultural Workshop in an only girls Aboriginal boarding high school on Wurundjeri Country in Australia, privileging Indigenous knowledges and empowering IYW within a school environment. Furthermore, the research also sought reflections and empirical evidence from teachers’ interviews in Indigenous contexts, both in Australia and Mexico, to validate the theory. CCoD provides a space through which researchers/designers can start to understand Indigenous peoples’ onto-epistemologies and the importance of the relatedness of Country and Place.

The investigation was designed using case study as a research methodology, but also theorising. CCoD as a methodology through narrating the journey of the CCoD process. This research uses the process of theory building from an original case study with evidence base generation and validity, verified by Indigenous and co-design methodologies theories. CCoD involved designing and implementing the Biocultural Workshop in collaboration with the IYW. Data was collected before, during and after the workshop using the following methods:

- Observation
- Field notes by the researcher
- Weekly reports of the researcher to the school
- Development of biocultural projects
- Stimulated recall as a reflection activity
- Interviews with school leaders and teachers
The data analysis was an iterative and ongoing process connected to data generation, data gathering and theory generation, which went through six analytical phases:

1. Reflective and critical analysis of literature review
2. Reflective analysis in data collection
3. Thematic analysis
4. Looking for negative evidence
5. Triangulation of information between participants
6. Creating conceptual and theoretical coherence (CCoD Theory)

At the beginning of the research, the workshop was planned over four steps (Ibinarriaga, 2014), as mentioned in Chapter 2, but within the holistic and flexible process of the research and the elaboration of the CCoD methodology the proposed co-design workshop changed and the Biocultural Workshop was born. These changes are the answer to the second sub research question: How can CCoD support the design of a Biocultural Workshop for IYW high school students in a boarding school context? (see more in Chapter 4 and 5). The need for this change in the workshop became evident during the analytical phase, with the triangulation of information amongst participants from an Aboriginal boarding school, as they gave their points of view on the workshop and following this evidence, I added three more stages which became necessary to the development of the CCoD methodology. The steps added were: relationships building, presentation of the biocultural projects and self and co-reflective thinking. These became essential steps for the implementation of the Biocultural Workshop process. The Biocultural Workshop is better described in Chapter 4, while Chapter 5 focuses on the theorisation of the workshop through CCoD.
During the research participants reflected and understood the array of methods that can be used to address diverse opportunities and challenges while privileging the relationality that people and Country have embedded in their Indigenous knowledge. Through the data collection and analysis of all of the participants’ voices, three main benefits were found within the CCoD: First, the collaboration between participants and organisations was respectful, holistic and productive with real and tangible outcomes. Second, IYW developed and/or enhanced their skills by working in capacity building. Third, the development of pride in both the students’ and the researcher’s cultural identity. The importance of this research is to capture Indigenous voices and give agency to IEK, relatedness, Country and Indigenous peoples, in particular IYW, in order to achieve biocultural diversity conservation and regeneration thought CCoD. This happened thanks to the application of a decolonizing approach, which privileged Indigenous voices and knowledge systems.

Five recurring themes were found during the data analysis, which are crucial and fundamental elements for the validity of the CCoD methodology and this research. The themes are:

1. Collaborative resilience enacted through space, time, flexibility and relationality
2. A respectful intersection of knowledge construction
3. The human agency that includes cultural identity, relationships and intelligent emotion management
4. The outcomes for the participants
5. The limitations of CCoD methodology
In discussing these themes, *Fourteen Axiological Tenets* were developed as part of the CCoD foundations, which are explored in detail in Chapter 5.

A complexity in this research is found in the way the term Indigenous is used, as it is generalised for all the Indigenous Countries and in the practice of CCoD methodology, the term Indigenous should be replaced with the name of the Country where the research takes place. This research was performed on the Country of Wurundjeri people on Coranderrk land belonging to the Kulin nations and in a Zapotec Country in Oaxaca, Mexico.

In the following sections, I discuss the ways in which the CCoD methodology promotes a space where relationality, Place, identity and agency can intersect in ways that can enable Indigenous and non-Indigenous people to collaborate in harmony. This harmony can be promoted by inviting participants who already share a desire to learn from one another and embrace the CCoD onto-epistemology within a design and educational environment. Throughout the next sections, I present the tensions and limitations of the research and the possible future research pathways that can be carried out to enhance and explore the CCoD methodology further.

**Positioning Participants and Spaces within CCoD**

CCoD is aimed at Indigenous peoples who are in contact with Country and want to share, collaborate, teach, learn and/or understand broader society while maintaining and privileging their own IEK and customs. CCoD is also for Indigenous peoples who want to conserve, recover and/or regenerate their culture and Country, and show the importance of their IEK, biocultural diversity and uniqueness not only to western society, but to other
Indigenous peoples as well. It is also for Indigenous people who are losing their IEK because of historical and ongoing injustice and dispossession of lands, and who want to revive, reaffirm, recover and reclaim their cultural identity, understanding how to contribute to the wider society with their Indigenous knowledge.

Similarly, CCoD is for non-Indigenous people who want to understand, learn, collaborate, share, recognise and acknowledge Indigenous peoples and their knowledge, understanding Indigenous onto-epistemologies and ways of becoming and being resilient in this complex world. It is for people who want to integrate Indigenous ways of being, knowing and doing to the broader society, and people who want to understand how to live the oneness of being with Place and Country.

**Research of Becoming - The Importance of Place and Relatedness within CCoD Methodology**

CCoD methodology articulates a way of becoming for Indigenous peoples and non-Indigenous people together. For CCoD it is essential that non-Indigenous people, researchers and designers understand Indigenous onto-epistemologies, the relatedness (Martin & Mirraboopa, 2003) and the agency of everything (Martin, 2017), the positionality through identity, and how everything connects on Country in Place (Graham, 2006). The relationality between Critical Co-Design, Indigenous Ecological Knowledge, Ways of Knowing and the dynamics of *Place* underpin the theory and the practice of the CCoD methodology, as well as its outcomes.
The CCoD Conceptual Framework includes three different outcomes supported by literature and practice throughout this research. Firstly, CCoD methodology is a new knowledge which encompasses the philosophy, the *Fourteen Axiological Tenets* and the CCoD Biocultural Workshop. Secondly, the Biocultural Workshop articulates the materialisation through lived experience of the CCoD methodology. Lastly, CCoD represents a journey, for all participants, in the way of becoming individually and together, within the contact zone taking in consideration advantages, tensions and opportunities. All these are relational, and they all have equal agency under the CCoD methodology and the conceptual framework.

This relatedness in Place and Country underpins the uniqueness and development of CCoD in the field of design, which has never been developed and explored before. In this case the CCoD was applied in an Aboriginal boarding school in Wurundjeri Country between 2017 and 2018. It is important to understand that CCoD is not designed as a methodology suitable for all places and settings, such as cities as discussed above. Given the importance of relatedness, CCoD is likely to work best in Places where agency of relatedness with Country and Indigenous peoples are respectfully entwined. The diagram below illustrates the relationship between these fundamental elements of the CCoD Conceptual Framework (see Figure 94).
The CCoD methodology is founded on a positive approach and a thriving and resilient process, rather than on a resistance one. The CCoD methodology challenges the problem-solving focus of western research paradigms, by reframing ‘problems’ as opportunities, and harnessing these opportunities within Place, by enacting a thriving methodology and process that benefits Country, biocultural diversity, IEK and Indigenous peoples. In critical pedagogy, the aim should be to criticise education not as a resistance activity and process, but as an opportunity to prosperous endeavours in a mutual learning and collaborative process (Dale & Hyslop-Margison, 2010; Freire, 1970, 1978). Hence, Indigenous approaches should focus on harnessing positivity amongst Indigenous peoples as a whole and seeing them as a wise society that holds ancestral knowledge and practices useful to conserve and regenerate the environment, rather than seeing them as an
oppressed and subjugated society. CCoD supports the agency (Martin, 2017) of Indigenous people and IEK, and it looks for reconciliation through action, lending agency to Country. As a bottom-up approach, it develops a process of transformation in the individuals, in the community and across different sectors of society (in this case Indigenous peoples and academia).

Even though I present a summary of the CCoD in this chapter, the main research question is answered in Chapter 5, in the section titled ‘CCoD methodology: The theory’. The question answered is: What are the elements, epistemologies, ontologies and discourse of an effective Critical Co-Design methodology that privileges and empowers Indigenous Young Women?

**Situating CCoD Methodology: Indigenous Design**

**Approaches through Decolonizing methodologies**

In this section, I summarise the answer to the first sub research question: How might CCoD add to Co-design and how is it informed by Indigenous methodologies? This question is extensively answered in Chapters 2 and 5.

CCoD is positioned in the field of design as new knowledge, empirically and theoretically supported by both co-design and Indigenous methodologies. Theoretically, CCoD is different to both methodologies as it presents a new concept and approach while recognising and developing the relationality between Design, Indigenous Ecological Knowledge and Ways of Knowing and Becoming, and the dynamics of *Place* that supports the research content and methodology. CCoD is theoretical and empirical as a design
methodology, working through action while collaborating with Indigenous and non-Indigenous people, researchers and designers, and by privileging IEK and Indigenous onto-epistemologies. Hence, being considered a decolonizing design methodology. CCoD is premised on Country and Place, which means it is centred on the relationality of all Entities that co-exist in certain Place within certain Country. CCoD considers and dovetails different elements of co-design, critical design, design thinking, biocultural design and Indigenous methodologies. It promotes multiple knowledge systems with its complexities, while always privileging Indigenous knowledges within the Country it collaborates with. ‘Indigenous research methods stress the moral nature of land and the need for relationality and interconnectedness with all Entities (life forces), this with ethical quality’ (Graham, 2006, p. 3).

For CCoD the notion of people, Place and Country are essential, and within that it creates a place, space and time where other realities can appear. In CCoD, Place changes realities, onto-epistemologies, protocols, values, the environment, interrelated Entities, and material, immaterial, tangible and intangible outcomes. Place changes based on space, time and Law, which depend on Country, participants, organisations and/or institutions and opportunities approached. Within Place, CCoD allows for the creation and development of a new space, the third space, where the intersection of Knowledges or possible hybridisation of knowledge becomes possible (see Chapter 5 for more details). CCoD created this third space in the Aboriginal boarding school to allow the exchange of knowledges and establish relations which is off-Country for everyone but sharing Place.

CCoD supports the theory of Martin and Mirraboopa (2003, p. 211), who claim that ‘Indigenist research occurs through centring Aboriginal Ways of Knowing, Ways of Being
and Ways of Doing in alignment with aspects of western qualitative research frameworks’. CCoD focuses on recognising and privileging Indigenous onto-epistemologies and ways of becoming within western society, but focussing on Indigenous opportunities, concerns and worldviews in collaboration with non-Indigenous peoples.

CCoD is different to Co-design and Indigenous methodologies as it merges three elements in a collaborative approach: the use of sustainability, co-design and Indigenous knowledge systems, towards enhancing biocultural diversity conservation and regeneration. Indigenous methodologies and recognition have been used very little in the field of design (Kelly & Kennedy, 2016) and even though collaboration is at the basis of traditions in Indigenous culture, design has been used mostly to ‘help’ and ‘assist’ Indigenous peoples in developing products, services and architecture for Indigenous communities in isolated and remote places (Garduño García, 2015). CCoD challenges the idea of simply giving help to Indigenous peoples, as CCoD is based on a collaborative approach to recognise and preserve Indigenous onto-epistemologies.

The decolonizing research theory, or research as freedom or emancipation, through co-design practices underpins this methodology through a respectful collaboration and intersection of ways of knowing. The teachers in Australia emphasised ways of being respectful to everyone, along with the ongoing consultation and flexible approach to students’ learning of the CCoD methodology. They also commented positively on the researcher/designer’s ontological approach, as the research did not impose the methodology on the teachers and the curriculum but built it together, although the researcher did propose a methodology at the beginning.
CCoD discusses critical design (Malpass, 2016) while focusing on inter-subjectivity and proposition as a form of decolonizing research (Tuhiwai Smith, 2012) through design, while collaborating with Indigenous peoples and generating new debates and practices within Indigenous design research. Through critical design, CCoD explores how biocultural projects (products and services) allow thinking in tangible ways, and how this can create a descriptive comprehension of complex issues, such as IEK. CCoD works as a platform where Indigenous peoples collaborate with non-Indigenous people and designers/researchers and in this safe space participants can understand Indigenous onto-epistemologies through tangible products, while these products are not only useful but may embody Indigenous knowledge and meaning while being actors of Place and Country. As Malpass (2016, p. 478) states, a ‘Critical design practice therefore facilitates a way of knowing, exploring, projecting and understanding the relationship between users, objects and the systems that they exist in’. In this case the CCoD practice promotes understanding of the relatiinality between people, place and IEK.

CCoD incorporates design thinking not in business and management, but for social innovation (Brown & Wyatt, 2010) as a way to improve society and it is an innovative, multicultural and interdisciplinary methodological strategy to facilitate the collaboration within Indigenous contexts. Brown (2009) argues that designers should be more involved in the big picture of socially innovative designs and sustainability, beyond the economic scope. Bjögvinsson et al. (2012) observe this big picture of social innovation as a challenge for design thinking. The Biocultural Workshop can be seen as a design-specific cognitive, motivational and emotional (Badke-Schaub et al., 2010) process/method that the researcher/designer can apply in the course of co-designing (Visser, 2006). Even if CCoD takes elements of design thinking, it opposes the idea of design as problem solving.
Instead, CCoD approaches, tackles and harnesses local opportunities rather than focusing on problems to ‘solve’, however it can also be engaged in a parallel way in challenges such as racism, colonisation and dispossession.

CCoD integrates elements of biocultural design (Davidson-Hunt et al., 2012) as it approaches biocultural diversity conservation and regeneration, and enhancement of cultural identity pride within Indigenous contexts. This research innovates in the development of a methodology (CCoD) and a method (Biocultural Workshop) to explore respectful biocultural design with Indigenous peoples on their lands.

CCoD discusses the complexity and challenges the design field faces, its methodology and process shift our understanding of what can be achieved through design. CCoD contributes in the field of design as a methodology through its theory, and as a tool and process through practice for academics and designers. The approach of designers should change to a Country and knowledge-centred approach instead of a human-centred one, and here lies the main challenge for co-designers.

For CCoD, Indigenous partnership is understood as the collaboration between Indigenous and non-Indigenous people regarding the significance of Country and biocultural diversity conservation and regeneration, and privileging IEK through co-design. CCoD ideally should be conducted on Country, through institutions such as high schools, organisations and companies which encourage the Indigenous knowledge approaches. As research from Ritchie (2012) shows, working in partnership with Indigenous (Maori) academics can culminate in a biocultural educational curriculum for the country involved. CCoD envisions the materialisation of new knowledge through design, benefiting Country.
There are broader issues in the relationship of design to Indigenous culture in general, and this has been articulated in both the *Australian Indigenous Design Charter* and *The International Indigenous Design Charter* (by Russell Kennedy, Megan Kelly, Jefa Greenaway, Brian Martin). The ten principles in these charters are a guide for designers and image makers to ensure their work is culturally appropriate and is conducted with Indigenous peoples and not about them and their culture. CCoD methodology can sit alongside these principles as both Charters articulate this premise of guiding. CCoD methodology is a pragmatic and material actualisation of the *Fourteen Axiological Tenets* of CCoD and is based on the ten principles articulated in both Indigenous design charters mentioned above (Kennedy et al., 2018).

**CCoD in Education and Policy**

CCoD methodology critiques scientific and knowledge globalisation leading to the loss of cultural (Chilisa, 2011) and biological diversity, instead it supports the decolonization of the methodologies (Tuhiwai Smith, 2012), looking for ethical and respectful ways of collaboration and materialisation between Indigenous peoples and academia. Both of these methodologies (co-design and Indigenous) are not considered in conventional school programs and have not been explored while collaboratively developing products and services harnessing and facilitating opportunities in communities.

CCoD supports policies, legislations and equal rights for Indigenous peoples in education through reconciliation, intercultural education and biocultural diversity conservation in action. Dodson (2010, p. 8) states that ‘our starting point must be to envisage children
with intelligence, imagination, culture and values, desires and expectations for their lives’, and CCoD focuses on enabling and supporting the development of expanding human qualities, full potential and capacity building. It fosters cultural identity pride and positionality within Place and relationality with Country. Dodson (2010, p. 8) also believes that ‘Schooling must start through building an understanding and connection with the social and cultural context into which Indigenous children are born’, such as cultural education and interface, to which this research adds the relationality between people and Place/Country through CCoD. CCoD facilitates the development in terms of students’ and participants’ experience, creating a confluence between culture, practice and experience, validating identity, building self-confidence and expanding expectations.

According to UNESCO (2010), education has a major role to play in promoting social cohesion and peaceful coexistence while reconciling competing worldviews and even the inherent tensions that surround intercultural education. In the guidelines of Intercultural Education it is stated that ‘through programs that encourage dialogue between students of different cultures, beliefs and religions, education can make an important and meaningful contribution to sustainable and tolerant societies’ (UNESCO, 2010, p. 8). Education is vital to the survival of culture according to UNESCO (2010). This type of education challenges the model of western education where generalised education is promoted in schools, offering one curriculum for all children in a country, like in Mexico. The CCoD methodology helps to break the paradigms of western education and proposes to decolonize education through co-design. CCoD supports educational policies as well as intercultural and Indigenous education worldwide. CCoD is a response to the challenge to provide a way forward towards quality education for Indigenous peoples in school and in communities. This research does not argue that CCoD is a solution for western educational
issues, but it definitely is another way to approach intercultural education in practice. For this research, ‘intercultural education aims to go beyond passive coexistence, to achieve a developing and sustainable way of living together in multicultural societies through the creation of understanding of, respect for and dialogue between the different cultural groups’ (UNESCO, 2010, p. 18). This can be done through the inclusion of multiple perspectives and voices, as CCoD does.

There are three basic principles that should guide educational policies with regard to Intercultural Education, and CCoD supports two of them: first, the respect of the cultural identity of the learner, and second it provides every learner with the cultural knowledge, attitudes and skills necessary to achieve active and full participation in society.

In relation to the first principle, CCoD argues that the connection to Country is very important for the participants, and the application of the CCoD methodology being carried out in a boarding school off-Country is seen as a tension. There is a reason why CCoD was applied to a boarding school, and it is supported in a study by Mander, Cohen, and Pooley (2015). The reason is that the participants in Mander et al. (2015) study viewed boarding schools as an opportunity for Aboriginal students, despite being challenging for the students due to the numerous cultural differences which they described as a culture shock. They viewed regional and remote communities as a socio-economic disadvantage and a multidimensional problem, and ‘emphasised the need for boarding schools to offer an alternative pathway and play a more central role in bridging the gap in educational outcomes for Aboriginal students’ (Mander et al., 2015, p. 324). The Human Rights and Equal Opportunity Commission [HREOC] (2009) stated that there are many remote communities across Australia with no reasonable access to secondary education, and the
same happens in Mexico. These circumstances have left many Indigenous peoples believing that family relocation or boarding schools are the only two viable options to ensure that their children receive an optimal secondary education experience (Prout, 2009).

The CCoD methodology is designed to be applied to an Indigenous school environment off or on Country and in this research IYW and the researcher had the opportunity to connect to Country from off-Country within Place (Graham, 2006). In this case being off-Country means that it is not the place where people born and grow up, they can be seen as outsiders from that Place. On the other hand, for CCoD being on Country means that participants are collaborating in the place they born and grow up, they understand and know the land. Even though boarding schools rip IYW away from a spiritual place of significance to them, the sharing of knowledges and culture gave significance to their uniqueness and developed an understanding of the importance of this distinctiveness. It becomes a different kind of Place (Graham, 2006). CCoD incorporates design in Indigenous schools as a methodology that takes into consideration the onto-epistemologies of participants through practice.

The CCoD methodology is an example of reconciliation in action in alignment with the current policies and legislations (Maddison, Clark, & De Costa, 2016) present in the Australian Curriculum as a way of creating a pluralistic reconciliated Australia. CCoD supports the United Nations Declaration on the Rights of Indigenous Peoples while ‘recognizing the respect for Indigenous knowledge, cultures and traditional practices that contributes to sustainable and equitable development and proper management of the environment’ (UN General Assembly, 2007, p. 4) towards biocultural conservation and
regeneration. CCoD also endorses and encourages the following articles regarding Indigenous peoples’ rights:

**Article 8 p. 10** - Indigenous peoples and individuals have the right not to be subjected to forced assimilation or destruction of their culture, this can be providing effective mechanisms and actions which has the aim or effect of depriving them of their integrity as distinct peoples, or of their cultural values or ethnic identities.

**Article 15 p.14** - Indigenous peoples have the right to the dignity and diversity of their cultures, traditions, histories and aspirations which shall be appropriately reflected in education and public information.

**Article 22 p.17** - Particular attention shall be paid to the rights and special needs of Indigenous elders, women, youth and children.

**Article 29 p.21** - Indigenous peoples have the right to the conservation and protection of the environment and the productive capacity of their lands or territories and resources. States shall establish and implement assistance programs for Indigenous peoples for such conservation and protection, without discrimination.

**Article 31 p.22** - Indigenous peoples have the right to maintain, control, protect and develop their cultural heritage, traditional knowledge and traditional cultural expressions (UN General Assembly, 2007).
To transform society, there should be a change in reforms and policies, in global information, thinking processes, education, food consumption and consumerism. This can be achieved by recognising the material and immaterial relatedness within Place, along with recognising the individual and collective knowledge, wisdom, values, ways of thinking and spirituality, and the effects this recognition has on present actions and future events.

The third sub research question: How could mutual learning and enhancement of reflective thinking skills be enacted during the CCoD methodology? is answered in Chapter 4 through the whole practice of mutual learning and reflective thinking of the process of the Biocultural Workshop. To answer it briefly, CCoD reinforces the knowledge investigation and mutual learning, discovering together the importance, appreciation and significance of Indigenous cultures through the triangulation between students’ Indigenous knowledges and practices, teachers’ and researcher’s experience and knowledge, and the resources of place. All this aims to see Indigenous young people become social actors and agents of change by using their knowledge and culture and while enhancing the pride of their ethnicity, as a constructive Indigenous youth development. CCoD recognises and acknowledges how most Indigenous peoples developed a close interdependence between knowledge, land and spirituality (Holmes & Jampijinpa, 2013).

Through the CCoD process, participants benefited by gaining skills in collaboration, creativity, new ways of thinking and sharing, mixed ways of communication and interaction, freedom, mutual learning, different ways to manage a project, critical and reflective thinking, various processes, diversity of Aboriginal knowledge, project completion, empowerment, self-confidence, self-esteem and self-determination. All this
despite the challenges they had to overcome together throughout the process, such as frustration, sense of giving up or messing up, fear, stress and sadness.

**Tensions and Limitations of the Research**

Although this research was designed as a bottom-up research approach to develop a bottom-up methodology, it has limitations to take into consideration. As a bottom-up research, it tries to leave problems out and focus on opportunities and strengths, and overcome negative challenges to change the patterns of western education by fostering the decolonization of knowledge, education and research and thus, giving Indigenous peoples and Country agency within Place. This bottom-up approach supports reconciliation policy, Indigenous rights and social justice through social action. However, this research does not propose changes in educational or state policies, which is a limitation when trying to incorporate the CCoD methodology as an educational program in the Australian Curriculum including relatedness to Country. This study did not open up a space to reform educational inequalities for students and teachers.

The research also had time related limitations, as it had to be finalised within a defined timeframe (three to four years), which prevented the necessary follow up in assessing the impact of the CCoD methodology on participants, and its and further application, in their near- and long-term future.

Another limitation that this research confronts can be found in communication and language barriers, as it uses the western academic language system which makes it difficult for Indigenous peoples and both Indigenous and non-Indigenous academics to
communicate effectively. Western academics are required to use complex and specialised language which can make the message unclear when being used in other contexts. The message should be concise, clear and in an approachable language to acquire mutual understanding from both sides, as mentioned in Chapter 5. Also, the researcher is an international student and English is her second language, which makes it harder for her to explain and express her worldview and ideas, hence, bringing tension into the research. The language element is rather functional and reductionist, and each language has agency (Martin, 2017), subjectivity and identity in explaining something from a different perspective. For further diffusion, I plan to create a book, a booklet and a presentation of the CCoD methodology in plain English and Spanish language for practitioners and non-academic audiences.

The gender imbalance in the students participating in this study (predominantly Indigenous females) means certain limitations exist regarding its generality. Hence, it would be important for future research to consider the views and perceptions of male participants to support the generalisation of the methodology. To this end, future research could assess the applicability and utility of the current findings in other boarding schools where boarding with male students is included.

The constructs of identity were difficult to set because of the complexity in defining cultural identity, and the different factors and components of different perceptions of identity. For this research, the constructs of identities are rooted in Country, however, according to Martin and Mirrabooqa (2003, p. 210) ‘Our Ways of Being evolve as contexts change. For instance, relations change amongst people at particular times, such as movement from one life stage’ to another. As mentioned before, this research has the
limitation of participants not being on Country, as they were all attending an Aboriginal boarding school off-Country and a new Place was then constructed in order to develop this research. In this new Place, conceived as a third space (see more in Chapter 5), CCoD enabled participants to immediately establish identities, interests and connections to determine relatedness (Martin & Mirraboopa, 2003). The purpose of this research was to establish the state of relations within Place.

Another challenge and tension of the research, which arose at the beginning of the researcher’s journey, was her unawareness of her Indigenous heritage, which caused some tension in the proposition of the CCoD methodology. Afterwards, once Indigenous heritage of the researcher came to light, tensions arose with the supervisors as some saw her Indigeneity as a tension and a complexity in how to incorporate her Indigeneity into the research. As non-Indigenous academics they did not know how to manage this aspect and the researcher needed to seek support from Dr Brian Martin her Aboriginal supervisor, who supported and mentored her from that moment forward. Through this journey, the researcher found her path and way of becoming through the reflective and insightful questioning of herself and her own worldview. As Martin and Mirraboopa (2003, p. 210) articulate, ‘behaviour and actions are a matter of our subsequent evolution and growth in our individual Ways of Knowing and Ways of Being’. This discovery was challenging not only for the researcher in the reconfiguration of her own self, but it was also seen as a challenge in the positioning of the research itself as western trajectories tend to fix identity, this seemingly problematic for others around her. Identity is not fixed in the CCoD methodology paradigm, as it is premised on Place and it is always situated. As a form of resilience, it is important for me to state the above and exercise my right for self-determination through self-definition, which was unpacked through this research and
CCoD journey. ‘Indigenous identity is dynamic and changing and that its expression is often about a conscious assertion of power and autonomy’ (Canessa, 2007, p. 214).

In this section, I summarised the tensions and limitations of the research and of the CCoD, as they are relational. The tensions and limitations of CCoD specifically are revealed in more detail in Chapter 5, where the fourth sub research question is answered: What are the tensions and limitations of CCoD?

**Further Research**

The scope of the research has not allowed the researcher to conduct and build relationality on-Country with Indigenous Young Women. Furthermore, the research did not allow a different form of materialisation or transmaterialisation (Munster, 2014) of Critical Co–Design. Transmateriality for this research is related to the relationality between the material and the immaterial, the human and the non-human (Munster, 2014), the physical and the spiritual. This forms the premise for further research on the materialisation and/or transmaterialisation of Critical Co-Design on Country with IYW, which can be achieved through a place-country based experience applied in different Countrys, where there will be a deeper exploration and production of physical pragmatics of articulating Indigenous Ecological Knowledge in ways to benefit and impact Indigenous peoples in Australia and Mexico. These will be in the areas of design, critical methodologies, urban and rural development, and design and practices in Indigenous led researches. As Uncle Charles Moran et al. (2018, p. 78) wisely state:

*‘The intelligence of Country reveals itself to us if we listen well, observe these connections closely, speak softly, and be our selves’.*
As mentioned before, even if CCoD was applied to participants who were off-Country, CCoD acknowledges relationality between people and place and the data suggests that applying CCoD where Country and people have relatedness can be paramount to recognising local knowledge. It is proposed that for further research CCoD should be further refined in other local Indigenous communities where there are opportunities for people to connect to a local place and its resources to compare the different outcomes. CCoD could be applied in other Indigenous boarding high schools and Indigenous high schools on Country, or among Indigenous communities with various contexts, or off-Country with Indigenous peoples from different Countries collaborating together while having diversity of IEKs and multiculturality in order to share participants’ knowledges. CCoD has multiple platforms to operate in and on that can be explored in further research and practice.

Even though in Chapter 5 a teacher from Mexico expressed an opinion that CCoD might be difficult to manage in cities, the researcher believes that it could be explored in further research, as there are many Indigenous young people who migrate to the cities or urban areas to pursue employment or education opportunities (UN General Assembly, 1999), as addressed in Chapter 2. CCoD has the potential to be used to nourish Indigenous cultural identity in urban settings as well, as relationships between land, language and identity can also be fostered in urban contexts (Baloy, 2011) within Place. It can be an opportunity for turning regeneration or revitalisation of Indigenous knowledges into a program. For example, for Aboriginal women who were born in an urban setting but still have strong connections with their culture and language. CCoD could work with the diverse arrays of cultural identities present amongst urban Indigenous students, possibly fostering
relationships between land and culture through CCoD. Furthermore, the CCoD methodology could also be available to the general public to increase people’s consciousness about Indigenous knowledge.

Furthermore, according to the feedback the researcher received from academics through the delivery of different presentations in symposiums and conferences, the Biocultural Workshop has a great potential not only in Indigenous and design settings, but other contexts as well, such as education in university settings, community development, international development, governmental settings, public organisations (NGO’s) and private companies. The benefits of the Biocultural Workshop can be verified in different environments through further research.

For further research, CCoD simply needs to be adjusted to the different requirements and possible achievements, depending on the participants’ circumstances, opportunities, interests and ages. It is advisable to apply CCoD where it is relevant to people who have a certain capacity of critical and reflecting thinking towards cognition about the importance of cultural identity, biocultural diversity conservation and regeneration through connecting the process. Through Chapter 5 and this conclusion the fifth sub research question has been addressed: How can CCoD be transferrable to other contexts?

Regarding the above-mentioned limitations of CCoD in policy-changing, further research is recommended in how to apply CCoD as an action plan or institutional reform in educational, social and governmental settings, which is necessary for policy changes to sustain the CCoD methodology as a program in school environments.
This research claims that CCoD is just one way to collaborate with Indigenous peoples in social research settings, as it depends on the opportunities, challenges and situations of different historical moments within a specific Place. The research also argues that CCoD is a powerful methodology that supports the process of building connections, understanding, communication and actions amongst different Indigenous peoples as well as non-Indigenous people.

**Epilogue: My Learning Journey and My Way of Becoming**

During my PhD journey I felt I started to decolonize myself. I realised, felt and understood what colonisation did to Indigenous peoples and to all those generations (mine included) who lost their Indigenous identity without knowing our Indigenous heritage. I realised the importance of recovering and regenerating my ancestor’s knowledge and pride, I opened the door for my family to talk about the past and our ancestors, and why they were scared of us knowing our background and heritage.

I want to finish this lovely journey to say that I am very proud of my Indigeneity, and my next journey will be to discover and recover as much as I can of my ancestors’ Indigenous knowledges as part of my way of becoming.
APPENDIX

1. Field notes of the researcher

The girls enjoy while learning. I used to discover what one’s real interests and passions are.
- The contact with nature and animals increase confidence.
- When they are working in groups, they enjoy more and interact more.

Opportunities:
- Communication
- Encourage them to express their interest and passions
- Give them responsibility without being a duty...
- Confidence with me

Challenges:
- Natural
- Art
- Sports
- Dance
- Music

Interests
- Design
- Creativity
- Cooking

The researcher is doing a design so the girls are more focused as they see the researcher working as well.

The environment is better with music.

2 girls didn’t want to do anything during the project. They are working with dots, lines, spirals, signs, Ah, flag.

Girls are advancing lots, they are finishing some artwork and starting others.
2. See website for the PowerPoint presentation of the Biocultural Workshop

https://www.slideshare.net/slideshow/embed_code/key/IBOQkiG6U3xGJw
3. Interview Questions Site 1 - Australia

1. Do you think the Critical Co-Design methodology (CCoD) is respectful to Indigenous and non-Indigenous people?
2. Do you think that this mutual learning helped them to build more confidence with their culture?
3. What do you think are the main benefits and limitations of the CCoD methodology?
4. Do you think there are shifts in the girls after the project?
5. What are the skills you think in the CCoD methodology facilitates to the girls and to the teachers?
6. What is your opinion about the sustainable products we developed?
7. Do you consider that there are mutual learning, creativity and empowerment and self-determination during the process and after the project completion?
8. How did you feel during the process as a teacher?
9. Would you adapt the critical co-design methodology to the program school?
10. What do you think about the relationship between the researcher and the students and the teachers?

4. Analysing questions (Table 8)

Open coding – Deducting reasoning and analysis

Table 8. Analysis questions open coding Australia

<table>
<thead>
<tr>
<th>QUESTIONS</th>
<th>CODING AUSTRALIA</th>
<th>THEMES &amp; DISCUSSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 1. Do you think the critical co-design</td>
<td>- Respectful for everyone Respectful process, involved in the project together</td>
<td>- Space, time, flexibility and relationality/ Dialogic space</td>
</tr>
</tbody>
</table>
| **methodology (CCoD) is respectful to Indigenous and non-Indigenous people?** | - Sharing cultures is where participants build connections  
- Respectful even similarities and differences of cultures  
- Importance of cultural identity through experience other cultures  
- *I like the way is, you know, a very different approach to research and it is not about you as an expert of your field to coming in, you have those skills and knowledge but you’ve come in and consult as much with the girls and with the staff about what the research might look like. As much as you have given a framework for to sit within, so that is being really fantastic* | - Respectful Intersection of Knowledges, Education  
- Cultural identity / human element  
- Conceptualising CCoD |
| **Question 2. Do you think that this mutual learning helped them to build more confidence with their culture?** | - Through mutual learning the students realised that each culture in unique and has regional elements, they identify their place and the diversity.  
- They realised the similarities and differences in cultures | - Respectful Intersection of Knowledges, Education  
- Cultural identity / human element  
- Space, time, flexibility and relationality/ Dialogic space  
- Conceptualising CCoD |
| **Question 3. What do you think are the main benefits and limitations of** | BENEFITS  
- Knowing and understanding the design process, working collaborative, opportunity to | - Space, time, flexibility and relationality/ Dialogic space / People |
| **The CCoD Methodology?** | develop critical thinking and problem-solving, use of natural creativity and cultural identity  
- Opportunity to work with co-design  
- Alternative education  
- Open up their eyes to different possibilities  

**Limitations**  
- More time  
- Help open others to the whole concept  
- *Some schools may not be necessarily open to the concept of co-design. They want and have it a very prescriptive, and very detail*  
- The approach the researcher to the school, it’s about that fortifying relationship between de researcher and the school that allowed the project to happen effectively  |
| **Question 4. Do you think there are shifts in the girls after the project?** | - The students are more self-confident to use their cultural identity and use diverse possibilities to present their uniqueness  
- The girls are taking a lot of pride in what they produced  |
| | and place (Physical space)  
- Respectful Intersection of Knowledges, Education  
- Conceptualising CCoD  
- Limitations  |
| | - Cultural identity / human element / emotions management /spirituality /  
- Outcomes – tangible and intangible |
| Question 5. What are the skills you think in the CCoD methodology facilitates to the girls and to the teachers? | - Giving them a better idea of what can be done  
- Just the value placed on them as co-designers, they have input therefore empowerment and self-determination |
|---|---|
| Communication between participants (researcher, teacher and students)  
- Critical thinking and reasoning  
- Explore ideas and concepts  
- Use design approaching changing contexts  
- Deal with change (resilience) - Explore the creativity, being creative with diverse resources  
- Working together, collaborative, teamwork  
- Sharing  
- Freedom, autonomy in expression  
- They can work with the skill they already have in an achievable project | Outcomes – tangible and intangible  
- Cultural identity / human element / emotions management / spirituality /  
- Conceptualising CCoD |

| Question 6. What is your opinion about the sustainable products we developed? | - Really important the use of sustainability in the projects, like recycling, upcycling, second-hand products remaking them  
- Look at products differently and transform them with exploring creativity | Outcomes – tangible and intangible  
- Conceptualising CCoD |
- They are beautiful and saleable items
- They look fantastic, and I think they’re really nice, you can see the combination of sustainability with design, and also the girls using the traditional artwork, so that’s really nice to see, the intersection of that tree things.

**Question 7. Do you consider that there are mutual learning, creativity and empowerment and self-determination during the process and after the project completion?**

- The students develop all of these skills working together and sharing ideas
- The nature of the project is not competitive but collaborative, so the girls thought more about the process and they support each other
- The project completion is crucial for sense of achievement, as they become more determined and can learn to manage their time to finish a project
- The students realised what they can achieve in certain amount of time, so process and outcomes are as important
- Collaboration. The researcher is a key element that allows to happen this collaboration element, the concept of co-design is very compatible, for example

- Outcomes – tangible and intangible
- Conceptualising CCoD
| Question 8. How did you feel during the process as a teacher? | - Having a background in design and technology was really handy to understand the project, to support the researcher and help the students to understand and supported when needed.  
- Is a guided process where the facilitator gives concepts, collaborative with participants work in the concepts and keep to the next step of the process, at the end of the project a reflective thinking of the whole process happens to understand how the project work together and understand the process and achievement with another perspective.  
- It was really enjoyable, just the atmosphere during the classes and activity is very positive.  
- Collaboration and sharing, it’s more engaging with them.  
- I felt that it was productive, and it was enjoyable sharing it.  
- Focus in enjoyable environment and space.  
- I like the way is, you know, a very different approach to | - Conceptualising CCoD  
- Respectful Intersection of Knowledges, Education  
- Limitations  
- Cultural identity / human element / emotions management / spirituality / |
**Question 9. Would you adapt the critical co-design methodology to the program school?**  
- Yes, definitely. Personal development, problem-solving, simple tasks, it needs readjustments in diverse contexts student (age)  
- Explore freedom  
Life skill, developing personal and professional life, not just as an educational plan  
- Students have more licence to shape the content of what they are doing

**Question 10. What do you think about the relationship between the researcher and the students and the teachers?**  
- Very good collaborative approach  
- Enough time to have a better approach and know each other  
- The researcher is seen as a revitaliser person  
- The confidence and cultural difference of the researcher helped to develop empathy with

- Conceptualising CCoD  
- Outcomes – tangible and intangible  
- Respectful Intersection of Knowledges, Education (Decolonizing education)  
- Space, time, flexibility and relationality
the participants, they can know that she made mistakes, and she solve the problem and challenges as well, she is learning, and she is fun.
- Respectful approach

5. Informing research questions (Table 9)

Open coding – Inductive reasoning and analysis

<table>
<thead>
<tr>
<th>QUESTIONS</th>
<th>CODING</th>
<th>AUSTRALIA</th>
<th>THEMES &amp; DISCUSSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>General aim</td>
<td>- respectful methodology</td>
<td>- space, time, flexibility and relationality/ dialogic space / people and place (physical space)</td>
<td></td>
</tr>
<tr>
<td>The general objective of this research is to conceptualise, explore and articulate critical co-design methodology (CCoD) as a case study, to privilege and empower Indigenous young women and Indigenous knowledge within a school environment (IYW) in megadiversity</td>
<td>- decolonizing education and research</td>
<td>- respectful intersection of knowledges, education</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- sharing cultures and knowledges with respect (mutual learning)</td>
<td>- cultural identity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- cultural identity through other cultures, realising the uniqueness of their own culture</td>
<td>- breaking power relations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- breaking power relations</td>
<td>- skills, professional and personal life development</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- freedom in communication and forms of expression</td>
<td>- resilience with own knowledge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- resilience with own knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>countries, Australia and Mexico.</td>
<td>- perfect intersection - sustainability, co-design and Indigenous knowledge -collaborative not competitive -guidance and facilitation of concepts, not imposition - building relationships</td>
<td>- outcomes – tangible and intangible</td>
<td></td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>-------------------------------</td>
<td></td>
</tr>
<tr>
<td>1. How is CCoD different to co-design and Indigenous methodologies?</td>
<td>- respectful for everyone and the process - time to know each other and share knowledges, build connections - consultation of the project with all the parts involved (participants and organisations) - mutual learning and collaboration -support and encourage uniqueness in culture and cultural identity pride - alternative education -decolonizing research in design and education within the school program -everyone has input and output -freedom and autonomy in communication and form of expression -resilience - use sustainability, co-design and Indigenous knowledge</td>
<td>-space, time, flexibility and relationality - respectful intersection of knowledges, education - cultural identity / human element / emotions management - outcomes – tangible and intangible</td>
<td></td>
</tr>
<tr>
<td>2. How can CCoD support the design of a biocultural project for IYW high school students in a boarding school context?</td>
<td>-- pride of cultural identity through experience other cultures - through mutual learning the students realised that each culture is unique and has regional elements, they identify their place and the diversity. - the students are more self-confident to use their cultural identity and use diverse possibilities to present their uniqueness. Sharing your culture - they realised the similarities and differences in cultures - knowing and understanding the design process, working collaboratively, opportunity to develop critical thinking and relationality people and place - cultural identity</td>
<td>- tangible and intangible outcomes - process and outcomes are as important - is a guided process even avoiding power relations - overcoming challenges and emotions together with positive attitude - personal and professional development - emotion management</td>
<td></td>
</tr>
</tbody>
</table>
problem-solving, use of natural creativity and cultural identity
- open up their eyes to different possibilities
- *the project completion helps them realise that they can start and finish a project with positive outcomes with their own knowledge. The girls are taking a lot of pride in what they produced. Therefore, empowerment and self-determination*
- critical thinking and reasoning, they understand and explore their capacity, skills and qualities. They can work with the skill they already have in an achievable project
- development of problem-solving and efficiency with creativity
- freedom, autonomy in expression
- *The combination of sustainability with design, and also the girls using the traditional artwork, the perfect trifecta to acquire confidence with what they already know*
- the project completion is crucial for sense of
achievement, as they become more determined and can learn to manage their time to finish a project - explore freedom with quest - students have more licence to shape the content of what they are doing - triangulation between students’ Indigenous knowledge, the teacher contribution and the resources of the place. It is an integral development that connects people and place -resources management according to community believes - they can learn value of the resources, and how to consume within their culture

<table>
<thead>
<tr>
<th>3. How could mutual learning and enhancement of reflective thinking skills be enacted during the CCoD methodology?</th>
</tr>
</thead>
<tbody>
<tr>
<td>- the mutual learning occurs through the process, first in sharing culture and knowledges. Second, through the process. Third, in the co-reflective thinking. - sharing cultures, experience other cultures - consulting as much with the girls and with the staff about</td>
</tr>
<tr>
<td>- respectful intersection of knowledges, education - cultural identity / human element -- space, time, flexibility and relationality/ dialogic space - intangible outcomes</td>
</tr>
</tbody>
</table>
what the research and mutual aims
- the students are more self-confident to use their cultural identity and use diverse possibilities to present their uniqueness
- different ways of communication
- freedom, autonomy in expression
- the project completion with the presentation
- through collaboration and working together towards a goal. Collaboration and sharing, it’s more engaging with them
- enjoyable environment and space

| 4. What are the tensions and limitations of CCoD? | Limitations | - more time
| - help open others to the whole concept
| - some schools may not be necessarily open to the concept of co-design they want and have it a very prescriptive, and very detail
| - the approach the researcher to the school, it’s about that fortifying relationship between de | - limitations |
5. **How can CCoD be transferrable to other contexts?**

- It is a project that can be used with different people, context and ages, it just needs to readjust the requirements and achievements depending on the age.

- Conceptualising CCoD

6. **Informing research aims (Table 10)**

Open coding – Inductive reasoning and analysis

**Table 10. Analysis informing research aims Australia**

<table>
<thead>
<tr>
<th>AIMS</th>
<th>CODING AUSTRALIA</th>
<th>THEMES &amp; DISCUSSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>• How IYW can improve environmentally, personally and professional education through the enhancement of their Indigenous skills (cooperation, curiosity, creativity), cultural identity, mutual learning, reflective thinking, empowerment</td>
<td>- they can use this as a life skill not just within the school but when they come back to their communities, using as a personal and professional skills</td>
<td>- cultural identity / human element / emotions management / spirituality / outcomes – tangible and intangible</td>
</tr>
<tr>
<td></td>
<td>- I could imagine that they continue it on, kind of the teachers could step back more and could the girls</td>
<td></td>
</tr>
</tbody>
</table>
and co-design biocultural projects through CCoD.  

- could start working and supporting one another and taking control of that.  
- the project completion is crucial for sense of achievement, as they become more determine and can learn to manage their time to finish a project  
- personal development, problem-solving, simple tasks  
- life skill, developing personal and professional life, not just as an educational plan  

<table>
<thead>
<tr>
<th>• Recognising eventual behavioural shifts on IYW due to the implementation of the CCoD.</th>
</tr>
</thead>
</table>
| - the students are more self-confident to use their cultural identity and use diverse possibilities to present their uniqueness.  
- the girls are taking a lot of pride in what they know and produced  
- open up their eyes to different things  
- autonomy in expression  
- teamwork, working collaboratively that’s the biggest gain for the students and for the staff  |

<table>
<thead>
<tr>
<th>- cultural identity / human element / emotions management / spirituality / outcomes – tangible and intangible</th>
</tr>
</thead>
</table>
- the students develop all of these skills working together and sharing ideas
- experience
- the project completion is crucial for sense of achievement, as they become more determined and can learn to manage their time to finish a project. The students realised what they can achieve in certain amount of time, so process and outcomes are as important -- knowing and understanding the design process, working collaboratively, opportunity to develop critical thinking and problem-solving, use of natural creativity and cultural identity
- the students are more self-confident to use their cultural identity and use diverse possibilities to present their uniqueness
- Analysing how students can discover and address diverse opportunities, challenges and environmental problems due to the relationality of participants, place and country through CCoD, harnessing biocultural diversity.

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<td>Na</td>
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</table>

- Identifying the impact of reflective thinking and mutual learning due to the implementation of the CCoD between IYW and researchers.

- the mutual learning occurs through the process, first in the sharing culture and knowledges. Second, through the process. Third, in the co-reflective thinking.
  - sharing cultures, experience other cultures
  - consulting as much with the girls and with the staff about what the research and mutual aims
  - the students are more self-confident to use their cultural identity and use diverse possibilities to present their uniqueness
  - different ways of communication
  - freedom, autonomy in expression

- respectful intersection of knowledges, education
  - cultural identity / human element
  -- space, time, flexibility and relationality/ dialogic space
  - intangible outcomes
- the project completion with the presentation
- through collaboration and working together towards a goal. Collaboration and sharing, it’s more engaging with them
- enjoyable environment and space

| • Identifying IYW way of doing through CCoD methods (co-design, co-create and co-develop diverse biocultural products and services). | Na | Na |

7. Interview Questions Site 2 - Mexico

Interview Questions Mexico

1. The educational plan of the school includes Indigenous practices and knowledge? Why? In case: How they are implemented? Which topics?
2. Have you ever used co-design as a methodology to link Indigenous and western knowledge?
3. What do you think about the CCoD methodology?
4. Do you think that this methodology can be important in school?
5. Would you apply this methodology to your students? Why?
6. Which is the class/subject more suitable to use this methodology?
7. Would you use this methodology as a part of the educational plan of the school and country? Why?
8. How many Indigenous teachers work in the school? Do they contribute to Indigenous education at school?
9. It is important to maintain and rescue Indigenous culture and knowledge?

8. Analysing questions (Table 11)

Open coding – Deducting reasoning and analysis

Table 11. Analysis questions open coding Mexico

<table>
<thead>
<tr>
<th>QUESTIONS</th>
<th>ANSWERS</th>
<th>CODING</th>
<th>THEMES</th>
</tr>
</thead>
</table>
| Question 1. The educational plan of the school includes Indigenous practices and knowledge? Why? In case: how they are implemented? Which topics? | - no strictly or as obligation  
- there is freedom in the teaching  
- the labour union is focusing in recovering the knowledge, we have been talked about projects related to Indigenous knowledge for ages | -not enough subjects to learn Indigenous culture and knowledge  
-lack of interest of the government, educational system, social system  
-important not only because Indigenous knowledge but because help to promote the fine and gross motor functions and to develop critical | -space, time, flexibility and relationality/dialogic space  
-limitedations  
-human element  
-respectful intersection of knowledges  
-education |
but just some had been realised.

- the academic development nowadays is not integral and it is what education needs.

- we need to work in the human component, emotions, frustrations, fear, children need to feel that they are capable of doing stuff, complete projects, feel self-confidence.

thinking, reflective thinking

-change paradigms of education

-emotions, frustrations, fear

-self-confidence development

-improve cultural identity

Question 2.
Have you ever used co-design as a methodology to link Indigenous and western knowledge?

-no as the terminology or field

- there have been projects but very isolated, there is not a follow up or continuity to keep going. I think that

-they have been using co-design in some integral projects without noticing.

-lack of continuity or following up.

-limitations

--space, time, flexibility and relationality
is there not a follow or constancy, you lose it. Is like culture if you do not pass it to the next generation and practice all the time you lose it. These projects have been done to link all the subjects in school, to be more integral.

<table>
<thead>
<tr>
<th>Question 3. What do you think about the CCoD methodology?</th>
</tr>
</thead>
<tbody>
<tr>
<td>- I like that CCoD targets to Indigenous culture, development of skills and motor functions, critical thinking and significance. CCoD also brings art, collaboration and emotion management. With -Indigenous culture, development of skills and motor functions, critical thinking and significance. -CCoD also brings art, collaboration and emotion management. With this the process and the outcomes as important.</td>
</tr>
<tr>
<td>-they know co-design as a field but not as a practice -they do not explore diverse fields, just once that are in the educational plan -they think that the problem is lack of time, disposition, communication and teamwork. The problem is pride and selfishness of who made the project or who has the acknowledgment.</td>
</tr>
</tbody>
</table>

-conceptualisation of CCoD - respectful intersection of knowledges
<table>
<thead>
<tr>
<th>Question 4. Do you think that this methodology</th>
<th>- yes, because there is a triangulation between students’ Indigenous knowledge</th>
<th>- triangulation between students’ Indigenous knowledge, the teacher contribution and the respectful intersection of knowledges</th>
<th>- CCoD is for connecting people and land through Indigenous knowledge - it is for communities not for cities because it considers people and land. - CCoD gives the students self-confidence, teamwork, start and finish a project. - research and investigate together - integral methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>this the process and the outcomes as important.</td>
<td>- I think this methodology gives the students self-confidence, teamwork, start and finish a project. I think the knowledge has significance when you investigate and this methodology supports this. - I think it is an integral and appropriate methodology.</td>
<td>- CCoD is for connecting people and land through Indigenous knowledge - it is for communities not for cities because it considers people and land. - CCoD gives the students self-confidence, teamwork, start and finish a project. - research and investigate together - integral methodology</td>
<td></td>
</tr>
<tr>
<td>Question 5. Would you apply this methodology to your students? Why?</td>
<td>- they can learn value of the resources, and how to consume within their culture.</td>
<td>- cultural identity</td>
<td>- conceptualisation of CCoD</td>
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<td>- some students lost the knowledge and identity</td>
<td>- resources management according to community believes</td>
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<tr>
<td></td>
<td>- yes, as it is important to reinforce Indigenous culture,</td>
<td>- create a balance between cultural identity and how the students can contribute to western society, so they can make business preserving the culture.</td>
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</tbody>
</table>

<table>
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<tr>
<th>can be important in school?</th>
<th>knowledge that are part of their culture, what the teacher can contribute and the resources of the place. Is an integral development.</th>
<th>resources of the place. It is an integral development that connects people and place</th>
<th>space, time, flexibility and relationality / physical space</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- the methodology can be applied to the school as the research process give the tools for the educational development.</td>
<td>- I do not give you the knowledge but we investigate together</td>
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</table>
as the students want to be more accepted in western society and many are ashamed of their culture, as in many cases being Indigenous is seen as illiterate, poor, ignorant. It is important create a balance between cultural identity and how the students can contribute to western society, so they can make business preserving the culture.

Question 6. Which is the class/subject more suitable to use this methodology?

- CCoD can be replace for these missing topics and activities that promote culture, environmental care and motor functions.
- CCoD can fit in arts adorned with

- arts
- optative subject
- de-stressing activity
- biology
- technology
- gastronomy
- dance
- music

- space, time, flexibility and relationality
- limitation
- conceptualisation of CCoD
**Question 7. Would you use this methodology as a part of the educational plan of the school and country? Why?**

- *yes, is good for strength local cultural identity. Learn about history, how our ancestors solve problems.*
- *I just see as a challenge how to insert CCoD in the educational plan.*
- *it can be intern at the school but would be better if were federal or state level. I can see it difficult but not impossible.*

- *can be seen as a non-professional or non-valued subject.*
- *CCoD as a living skills development (cooking, business, family, emotions management).*
- *integral methodology*

- *learn from the past*
- *cultural identity*
- *cannot be part of the educational plan from the country as is just focussed on Indigenous communities*
- *Indigenous schools in communities, should have different type of educational program?*
- *at the beginning is difficult for teachers to link the CCoD with the educational plan, it should have work*

- *human element*
- *respectful intersection of knowledges*
- *education*
- *limitation*
- The teachers do not know how to link the methodology with the educational program, space and time.

| Question 8 - How many Indigenous teachers work in the school? Do they contribute to Indigenous education at school? | Approximately 50% |
| - Some teachers stimulate and teach Indigenous practices without noticing |
| - There are Indigenous teachers whom teach the students traditions and Indigenous knowledge but not as a part of the educational program, it is because they want to teach ancestral knowledge. |

- Indigenous teachers in the school help to promote Indigenous knowledge |
| - Half of the schoolwork force is Indigenous |
| - With Indigenous teachers’ cosmovision they relate the classes to their costumes and history of the community |

- Human element |
<p>| - Respectful intersection of knowledges |</p>
<table>
<thead>
<tr>
<th>Question 9. It is important to maintain and rescue Indigenous culture and knowledge?</th>
<th>-yes</th>
<th>- the people from the community prefer easy work well paid than ancestral knowledge, they did not know the importance of their own knowledge.</th>
<th>- human element</th>
</tr>
</thead>
<tbody>
<tr>
<td>- the field and agriculture and handicrafts were the main income from the community, but handicrafts take lots of time to go to look for the soil, clay, then mix and design the form, then cook it, etc. In the 70’s the forestall enterprise arrived and promise the people that with less time of work they could generate more income and resources, that was a social grow but in a long term that is ending up with the customs and ancestral knowledge.</td>
<td>-lack of interest in Indigenous children</td>
<td>- feeling of oppression, marginalisation, racism</td>
<td>- respectful intersection of knowledges</td>
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<tr>
<td>-the knowledge of the elderly is not</td>
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<td>- limitations</td>
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<td>- incentive and appreciation of culture</td>
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<td>- children need to see significant benefits of their Indigenous knowledge to keep their interest</td>
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<td></td>
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<td>- improve and strengthen cultural identity</td>
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</tbody>
</table>
being transmitted to children most of the time because lack of interest of the children.

- Spanish had seen as an advancement in society and that is why children stop talking language. Even though nowadays there are some teachers in some schools who teach language like Zapotec. Indigenous language as a sign of marginalisation and the children are not interested anymore.

- I remember that in the 80s they started to teach Zapotec at university and the students that knew Zapotec could
apply for a scholarship. This was an incentive for me to recover the language and learn it 100%, now I can speak 50% and I can understand 100%.

- in Ixtlan the community is losing the language because shame, history and western interventions. It is an error and shame to forget our roots.

‘if we had respect to mother land life would be so different’.

9. Informing research questions (Table 12)

Open coding – Inductive reasoning and analysis

Table 12. Analysis informing research questions Mexico
### General aim
The general objective of this research is to conceptualise, explore and articulate critical co-design methodology (CCoD) as a case study, to privilege and empower Indigenous young women and Indigenous knowledge within a school environment (IYW) in megadiversity countries, Australia and Mexico.

<table>
<thead>
<tr>
<th>QUESTIONS</th>
<th>CODING MEXICO</th>
<th>THEMES &amp; DISCUSSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>- CCoD promotes fine and gross motor functions and to develop critical thinking, reflective thinking</td>
<td>- Indigenous culture, development of skills and motor functions, critical thinking and significance.</td>
<td>- Conceptualisation of CCoD</td>
</tr>
<tr>
<td>- Change paradigms of education</td>
<td>- Emotions, frustrations, fear</td>
<td></td>
</tr>
<tr>
<td>- Self-confidence development</td>
<td>- Improve cultural identity</td>
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</tr>
<tr>
<td>- CCoD also brings art, collaboration and emotion management. With this the process and the outcomes as important.</td>
<td>- CCoD is for connecting people and land through Indigenous knowledge. It is an integral development that connects people and place. - Cannot be part of the educational plan from the country as is just focussed on Indigenous communities</td>
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</tr>
<tr>
<td>1. <strong>How might CCoD add to Co-design and how is it informed by Indigenous methodologies?</strong></td>
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<td>---------------------------------------------------------------</td>
<td></td>
<td></td>
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<tr>
<td><strong>-Integral methodology</strong></td>
<td></td>
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<tr>
<td><strong>-CCoD is for communities not for cities because it considers people and land.</strong></td>
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<tr>
<td><strong>-CCoD do not give you the knowledge but people investigate and share together</strong></td>
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<tr>
<td><strong>-Create a balance between cultural identity and how the students can contribute to western society, so they can make business preserving the culture.</strong></td>
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<tr>
<td><strong>-Learn from the past</strong></td>
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<td></td>
</tr>
<tr>
<td><strong>-Change paradigms of education</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>-Because help to promote the fine and gross motor functions and to develop critical thinking, reflective thinking</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>-Emotions, frustrations, fear, self-confidence development</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>-Improve cultural identity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>-Theory</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>-Critical theory</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>-Conceptualisation of CCoD</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>-Hybridism/mix between Indigenous methodologies</strong></td>
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</tbody>
</table>
| 2. How can CCoD support the design of a biocultural workshop for IYW high school students in a | -Change educational paradigms  
-Enhances management of emotions, frustrations, fear.  
-Enhances self-confidence, cultural identity | -Respectful Intersection of Knowledges  
-Methodology validation  
-Proof |
|---|---|---|
| | -Balance between theory and practice  
-Indigenous culture, development of skills and motor functions, critical thinking and significance.  
-CCoD is for connecting people and land through Indigenous knowledge  
- Triangulation between students’ Indigenous knowledge, the teacher contribution and the resources of the place. It is an integral development that connects people and place  
-C-Create a balance between cultural identity and how the students can contribute to western society, so they can make business preserving the culture. | and co-design methodology |
| boarding school context? | -Connecting people and land through Indigenous knowledge  
- Gives the students self-confidence, teamwork, start and finish a project.  
- *Learning through triangulation, students’ knowledge, teachers & researchers’ knowledge and place resources contribution and knowledge. Integral development that connects people and place*  
- Create a balance between cultural identity and how the students can contribute to western society, so they can make business preserving the culture.  
- Integral education, living skills development  
- Critical thinking and reflective thinking  
- Children see significant benefits because the use of their Indigenous knowledge to keep the interest in learning and use it for living among society | -Triangulation of learning  
- Skills development |
### 3. How could mutual learning and enhancement of reflective thinking skills be enacted during the CCoD methodology?

- Learning Through Triangulation, Students’ Knowledge, Teachers & Researchers’ Knowledge and Place Resources Contribution and Knowledge. Integral Development That Connects People and Place
- Management of Emotions, Frustrations, Fear
- Development of skills and motor functions, critical thinking and emotion management through the process
- Discovering together the importance, appreciation and significance of the Indigenous cultures
- Improving our cultural identity together
- Patience

### 4. What are the tensions and limitations of CCoD?

- SCHOOL
  - Lack of interest and understanding of the government, educational system, social system in Indigenous culture and knowledge

- Practice of CCoD
  - Breaking educational paradigms
  - Human element
  - Respectful Intersection of Knowledges

- Time and space

- Limitations
  - Respectful Intersection of Knowledges
<table>
<thead>
<tr>
<th>Lack of continuity or following up.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be seen as a non-professional or non-valued subject</td>
</tr>
<tr>
<td>At the beginning is difficult for teachers to link the CCoD with the educational plan, it should have work explanation to introduce it</td>
</tr>
<tr>
<td>No space for diverse type of education in the federal educational plan</td>
</tr>
</tbody>
</table>

**PARTICIPANTS**

- Lack of interest, motivation, time, disposition, communication and teamwork.

- Pride and selfishness of how the project is made or who has the acknowledgment.

- Power relations

- Lack of cultural identity and different criteria of sense of belonging
| 5. **How can CCoD be transferrable to other contexts?** | -Can be applied to different communities  
-Important not only because Indigenous knowledge but because help to promote the fine and gross motor functions and to develop critical thinking, reflective thinking, emotion management, self-confidence development,  
-Can be used in diverse environments and places among Indigenous peoples and knowledge | -Transferrable concepts  
- Space, time, flexibility and relationality  
-Education |
10. Informing research aims (Table 13)

Open coding – Inductive reasoning and analysis

Table 13. Analysis informing research aims Mexico

<table>
<thead>
<tr>
<th>AIMS</th>
<th>CODING</th>
<th>THEMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• How IYW can improve environmentally, personally and professional education through the enhancement of their Indigenous skills (cooperation, curiosity, creativity), cultural identity, mutual learning, reflective thinking, empowerment and co-design biocultural projects through CCoD.</td>
<td>- CCoD targets to Indigenous culture, development of skills and motor functions, critical thinking and significance. - CCoD also brings art, collaboration and emotion management. With this the process and the outcomes as important. - I think this methodology gives the students self-confidence, teamwork, starting and finishing a project. I think the knowledge has significance when you investigate and this methodology supports this.</td>
<td>- Human element - Outcomes of Participants - Space, time, flexibility and relationality / People and place</td>
</tr>
</tbody>
</table>
- Triangulation between students’ Indigenous knowledge, the teacher contribution and the resources of the place. It is an integral development that connects people and place.

- They can learn value of the resources, and how to consume within their culture.
11. Example of the reports to the school to inform on the progress of the students

Worawa College
Session 8, 2017

Report #8

Supporting Caring for Country class

Activity

Activities:
1. Only one girl assisted to this class as the other ones were in other activity.
2. The girl advanced in her pot and made another art.
3. The girl taught the researcher through storytelling and drawings different signs of Aboriginal culture.

Roles:
The girl had the role of teacher while explaining and teaching the researcher diverse signs of Aboriginal culture, as designer while design the project, and as creator while making reality the design.
The art teacher made some art to show different styles to the girls.
The researcher had the role of apprentice while learn of Aboriginal signs and stories, as co-designer while making projects with the girls, and support of the girl during the process when needed.

Relationship:
As this class was only for one girl, the treat was very personalised. Sharing knowledge, and the process of teach and learn was simpler and flowing. It was relaxed and the three parts had time of work, learn, teach, relax, concentrate and talk about life.

1. CCoD process and advances

Process and advances:
Only one girl advanced her project.
2. Evidence of learning

Skills:
The girl in this session developed teaching and learning skill, co-design and co-develop projects, as well as working tranquil without pressure.

Cooperation:
The girl was very cooperative and sharing with the researcher. The innate skill of share and explain can be seen in a flowing manner.

Curiosity and Creativity:
The girl had curiosity in diverse types of techniques of doing her project, experiment in different products and styles. Thus, the creativity mixed with her knowledge arose.

Reflective thinking:
There was not time of reflective thinking as it the co-develop stage and it is more about create, design and problem solving while needed.

Empowerment:
The girl is acquiring self-confidence to take decisions of what she really want. This empower her towards self-determination as personal management, problem solving, goal setting, decision making, choice making and hands-on experiences.

Co-design, co-create and co-develop:
The girls are in the stage of co-develop the projects they design in the first stage.
3. School agenda & CCoD

The project is adapting and mixing in different courses such as Caring for Country and art class. The negotiation between the teachers, students, staff and researcher is being fluent and friendly all the time. This reflect in the positive environment during the sessions.

Reflections

Opportunities:
The girl has art skills that are embedded in her process, and she has values and Indigenous knowledge that privilege her work and goals.

Needs:
The project needs more sessions to be complete with real and positive results.

Challenges:
The school agenda is very tight so the sessions has been moved and some cancelled. The challenge is negotiating with other classes and the school to achieve the goals set at the beginning of the project.

Interests:
As there is a risk of project achievement, the researcher asked for more sessions to compensate the sessions the girls were in other activities.

Observation and Benefits of CCoD:
In Critical Co-Design methodology (CCoD) are embedded the values of relationship, responsibility, rigour and respect.

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