Re-membering a future
Regenerating ancestral wisdom-in-action through Indigenous inspired learning in Western higher education

Louise van der Stok
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…Tederheidshalve
onverteerbaar is wat vervuld voortdurend lediger en bevredigd alleen alleener en
alleen vredelozer maakt, nu: hoe een ding en ben ik zo zoekgeraakt?

Fritzi Harmsen van Beek

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Abstract

In this research I explore insights from North American Indigenous ways of living, knowing and learning for the redesign of an existing university course named Ecological Design and Permaculture. The goal of this research was to create a living example of indigenous inspired partnership learning in Western higher education and to deepen understandings of partnership culture in general. I have integrated cultural transformation theory from Rianne Eisler and North American Indigenous wisdom to formulate a framework for cultural transformation towards partnership and steppingstones for educational design. These have resulted in various course elements and a course redesign, which have been evaluated with the students.

Foreword

I would like to thank everyone and everything that has helped me through this journey. Especially Reineke, my first supervisor in the beginning who spent many hours going to walks and chats with me, always checking in with the process. I would also like to thank Arjen and Koen for helping to bring this work to an end just before the summer break. I would like to thank Ester, my friend and partner in crime with whom I've shared my ideas, findings and worries in the whole journey. I would like to thank Taxi, my cat, for occasionally walking over the keyboard and being my mentor in life. I would like to thank the maple tree in the garden who gave me shade and energy during the long hours working there. I would like to thank the chocolate trees of the world. I would like to thank the North American Indigenous peoples for being who they are and sharing their wisdom with us. And I would like to thank all the people who helped me to finish this, taking other work off my shoulders and cheering for me till the end. It has not been easy a lot of the time. This was mostly due to all the self-criticism and doubt that we learn to apply to ourselves in this silly world. But I feel more free now. It has been important to express my observations and some pain about the world in the introduction of this thesis. It has also been important to understand the global situation today from a cultural development of domination. I feel more forgiveness knowing that people have been caught into this cultural pattern for a long time. It is not an easy task to break from it. Now I know a little better how to go about it. I hope it will inspire others too to just make the secular fence of knowledge redundant and use it as a laundry line or something.

1. Introduction

"Every society ever known rests on some set of largely tacit basic assumptions about who we are, in what kind of universe we find ourselves, and what is ultimately important to us. Some such set of assumptions can be found to underlie the institutions and mores, patterns of thought and systems of value that characterise society" (Harman, 1988:10).

A few years ago I went to see an informative movie screening about climate change which had been government funded. Several major cities had circus tents put up as temporary cinemas, where rows of seats ringed around a large globe hanging in the middle. The movie was screened onto this globe. As I entered, I was encouraged by the setup, as if it was daring to say "So, here we all are, let's face this together". But then the movie dryly explained the mechanics of climate change and the expected consequences in the far future in rather mathematical terms. It was conservative; information about current effects were left out, imagery was technical and showed no suffering of humans or other living beings. Not a single word was spoken about lifestyles, overconsumption or the growth economy. At the end, a calming almost belittling tone presented some technological advances that will surely save us. As if some high authority was saying "don't worry children, now go back to play, science will sort this out for you". Immediately after the movie, instead of taking the opportunity for some exchange on this rather fundamental issue that probably requires everybody's care and input to resolve, we were sent off quickly in an inconvenient silence.

The science is clear, the experience is real, more and more for many. Not only is biodiversity declining and the climate already rapidly changing, watersheds are drying up, soils are depleting, poverty and social inequality keep increasing and economies are becoming more and more fragile. For myself and my generation, it is a serious question whether to welcome children into a future of which I do not know whether I would like to live it. Considering the urgency and the wicked complexity of the current global crises it is remarkable that technocratic solutions are so dominantly proposed while almost entirely ignoring issues of values and socio-economic structures. We seem to be floating in this dream, while the fundamental issues remain under addressed. The movie situation illustrates so well what activist scholar Joanna Macy has termed the Business as Usual response of mainstream policy, corporate leaders, advertisement and even educational institutes which keep telling a story of economic and technological success, while from all the cracks of society another story unfolds, the Great Unravelling: we are heading for mass trouble or even extinction (Macy & Johnstone, 2012).

This last story also reveals the continuous economic growth that powers globalisation, corporate power and a culture of materialism as a destructive force which relies on technocratic myths of inexhaustible natural resources, cheap labour, energy and the idea that everything can be fixed (Shiva, 2001; Sakar, 2001). With it comes not only a full array of environmental problems that sustainability is often concerned with, but also mounting social issues. We see rising levels of poverty, social and economic inequality, violence and crime, obesity and unhealthy lifestyles, financial insecurity, political polarisation, increase in loneliness, disconnectedness, stress and depression, anger, alienation, apathy, also termed the crisis of connection (Way et. al. 2018; Keller 2002; Macy and Brown 1998; Naess 2008; Ehrlich 2010; Bratman et al. 2012; Zylstra 2014). The

pursuit of wealth and possessions as an end in itself is known to lead to depression, lower life satisfaction and happiness, and mental disorders (James, 2007). Much like biodiversity, the worldwide diversity of cultures, languages, knowledge systems is eroding fast as the local worldviews, values and ways of living are restructured fundamentally by the global free trade economy under the name of 'progress' (Shiva, 2001; Jacques & Jacques 2012, Romain 2015). The obsessive preoccupation with technological advancement seems to embody a kind of relentless blindness. Economic growth and technological innovations are surely beneficiary, but not when they are embedded in a globalising culture of extraction and materialism, in other words a pervasive form of colonialism (Williams, 2018; Wolfe, 2006). It is a cultural system whose "*decisions and priorities do not reflect an intention toward life*" (O'Sullivan & Taylor, 2004:1). A culture in which knowledge, technology and wealth are not necessarily used to create a better life for all living beings, here now and in the future. Instead our activities and ideas are no longer grounded in life, whether social, ecological or spiritual, but increasingly structured into an artificial reality of technology, abstract knowledge and the endless pursuit of more material wealth (Esteva & Prakash, 1998; Macy & Johnstone, 2012). We are literally dis-membered from life - from being equal participants in the reciprocity of social, ecological and spiritual relations which enable life to unfold (Williams, 2012; Starhawk, 1994). Modern society is making people unhealthy, unhappy and it is eroding away the very foundations of life, apparently with an illusion that life can just be made elsewhere.

Underlying this trend is a cultural caught up in a dualist mode of thinking and doing typified by a tendency to separate and rank; human society over the rest of life, or so called 'nature', mind over body, cognitive knowing over other ways of knowing, male over female, white over coloured, etc. (Latour, 1993; Riley-Taylor, 2002). This creates a foundation for inequality and thereby injustice that we see expressed in so many relationships between these dualisms (Way et al. 2018; Riley-Taylor, 2002; Macy, 2007). It is a way of relating that does not reflect an equal, caring and relational mode of being, but allows for the objectification of things, also people, an *instrumental mode of being* (O'Sullivan & Taylor, 2004). It is functional to a survival strategy of domination, or *power over* instead of *power with* (Eisler, 1987). Everything has become a means and people merely users and achievers. Preoccupied with how to achieve more of the same material goals we no longer see a bigger picture or meaning to life that may guide our actions. Human society is not considered as part of the natural environment, an expression of it, but the other way around; the environment is, like anything else, a resource for material or aesthetic use (Latour, 1993; O'Sullivan 1999). Also nature conservation, which is rooted in a concern and care for life, expresses a variety of dualisms. "Nature" is defined in human terms as something separate and particular, not everything is nature. And as we decide on which nature is prioritised in protection over others, we rank and separate nature. It is a mindset of control over the environment, rather than living in partnership, or better, being nature (Macy & Johnstone, 2012; Naess, 2008). The larger issue of cultural change is increasingly relevant for nature conservation, as the protection of isolated areas and species appears insufficient to halt biodiversity loss. What we do to each other, how we see each other, how we relate is reflected in what happens with the land (Armstrong, 2002).

For young people it is an extraordinarily confusing time to be alive. Many environmental tipping points have already been passed and yet, so little is done. We find ourselves among despotic leaders like Putin, Bolsonaro or Trump and the largest delegation at the recent COP were representatives of the oil industry (McGrath, 2021). In the meantime mammoth scale multinationals find their way into

politics, health care and increasingly research and education. How to make sense of such a world? Educational spaces should be important places where young people are supported to find their way in this context. And we know that they are important spaces for young people to shape their views, attitudes and skills for the future (Vega-Marcote et al., 2015). However, education is still much centred around knowledge transmission, rather than stimulating reflexivity and enabling students to become inspired actors in the process of change (Lambrechts et al., 2013). Most higher education takes place within the environment of the classroom or increasingly behind the computer - away from the living environment and from social and economic activities or relationships that constitute our lives. In the separation of disciplines, students grow into a particular perspective operational in their field, becoming detached from the viewpoints of others and more holist perspectives. Value systems of domination are not generally reflected upon but implicitly reproduced (Riley-Taylor, 2002; Eisler & Fry, 2019). Sustainability is most often still addressed as a technological fix, rather than fundamental cultural change. The wide array of sensibilities through which humans can learn such as bodily senses, the emotions, intuitions, imaginations, making, crafting, doing, interacting, playing and sharing are largely excluded in the learning process, and thereby excluded from the experience of being human in a living world for most parts of our day (Riley-Taylor 2002; O'Sullivan, 1999). Young people are raised and routined into an isolated, atomized observer consciousness; more relational or spiritual ways of knowing are not valued or allowed in academia (Shahjahan & Haverkos, 2011). "*Many of the world's crisis begin with an education that alienates us from life in the name of human domination, fragments instead of unifies, overemphasises success and careers, separates feelings from intellect and the practical from the theoretical and unleashes on the world, minds that are ignorant of their own ignorance*" (Riley-Taylor, 2002:).

There has been great effort to establish transformative learning approaches that build towards more sustainable ways of thinking and acting in the world. However, it remains hard to put these approaches in practice. Teachers and staff do care about sustainability, but there is often no space to integrate it in curricula (Edwards, 2005). Approaches that are integrated, fail to challenge current paradigms (Huckle & Wals, 2015). Education for Sustainable Development, the most common approach in higher education, is indeed continuously at risk of becoming yet another instrument of the neoliberal paradigm (Zylstra, 2014; O'Sullivan, 1999; Kahn, 2008). This is all together not surprising if one realises how deeply instrumentalism is culturally ingrained, embedded in the psycho-spiritual tissue of societies, gender and power relations, norms, values, worldviews and even language. From this perspective, it is strange to expect that sustainability can just be learned in 3 years of university where it would really require a life-long nurturing culture to develop and sustain it.

The revitalization of our planet seems to require an equally powerful revitalisation of our culture. The urgent question is how to start weaving a different tissue by building regenerative cultures throughout society, in this particular case, in higher education. In contrast to popular views that humanity is inherently selfish and cruel, we may find hope in historical analysis that a diversity of cultural forms have existed throughout human history (Dawkins, 1989; Bregman, 2019). Eisler formulated *cultural transformation theory* to make sense of the state of our world through the tracks of European history (1987; 2002). In this perspective, the mounting systems disequilibrium we experience today is an expression of a dysfunctional cultural type she calls a domination model. This cultural model seems to have become increasingly dominant across Eurasia in the period after 5000

BCE, before which cultural organisation appeared more gylanic[1] (Gimbutas, 1982; Eisler, 1987; Mellaart, 1975). Archaeological findings from before 5000 BCE include much evidence of cultures that were organised around the principle of *linking* - resulting in relatively horizontal power relations, equality of the sexes and a collaborative attitude towards the environment. They show evidence of relative peace and equality, as well as high cultural development and creativity. Violence and inequality were not absent from these societies but were by far not as deeply institutionalised as in domination cultures. Eisler's call this type of cultural form a partnership model. A domination culture is primarily organised by the principle of *ranking* - one type of (non)-human over another. In the history of Eurasia, this model has taken the shape of patriarchy, where sexes and values have been stereotyped and ranked as 'male' over 'female' (Riley-Taylor, 2002). For millennia this has been expressed in the often-violent suppression of women and 'lower' classes as well as so called feminine aspects such as compassion, care, emotion, vulnerability, the body, intuition and spiritual ways of engaging with nature (Eisler, 1987; Ma; Knippenberg, 2010; Macy, 2007). Cultural codes and rituals related to reciprocal human-environment relationships were erased in the process. Although emancipation movements during the last centuries have reinstated partnership values in many Western and other countries, domination structures remain ingrained and are still enacted visibly or invisibly throughout society, including education (Way et al. 2019; Riley-Taylor, 2002). Today's neglect of cultural transformation for sustainability as opposed to a technological fix can be understood as part of a persisting pattern of domination that blocks a shift towards partnership culture (Eisler, 1987; Macy, 2007). This is not to say that high technological development is part of a dominator culture per se. According to Eisler, the problem of sustainability is not modernisation or technological advancement but its embeddedness in a dominator cultural fabric (Eisler, 2002).

The dominator metaphor is so deeply ingrained in languages, imagery, institutions and learning that it is hard to imagine other ways. We are oftentimes hardly aware of how it is reproduced. Many indigenous cultures stand as a powerful presence in the midst of this situation - a living, tangible memory of a different way of being in the world. *"Indigenous voices matter because they can still be heard to remind us that there are indeed alternatives, other ways of orienting human beings in social, spiritual, and ecological space. This is not to suggest naively that we abandon everything and attempt to mimic the ways of non-industrial societies, or that any culture be asked to forfeit its right to benefit from the genius of technology. It is rather to draw inspiration and comfort from the fact that the path we have taken is not the only one available, that our destiny therefore is not indelibly written in a set of choices that demonstrably and scientifically have proven not to be wise"* (Aikenhead & Michell, 2011: 217–218). Many cultural groups that are referred to as indigenous today carry within them a deep ancestral wisdom refined over thousands of years of direct human experience in the living environment. Indigenous peoples or cultures cannot be defined in one category and express a vast cultural diversity. By this term we mean cultures that embody a level of historical continuity with pre-colonial societies, with distinct social, economic and cultural systems (UN). Among them we find sophisticated examples of partnership culture with a deep ecological awareness and rich expressions of a fundamentally relational consciousness which is embodied in cosmology, social institutions, daily practice, childhood education, ritual ceremony and language (Berkes, 2008; Cajete, 2000; Nelson, 2008). Many indigenous languages express a participatory

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[1] Gylany is a neologism composed of gy (from the Greek gyne or woman) and an (from the Greek andros or man), with the linking letter l between them standing for the Greek verbs lyein (to resolve) or lyo (to set free) (Eisler, 2002:171).

worldview in being verb-based, like for the Anishinaabe the sea is a 'verb', a living entity with agency (Kimmerer, 2013). Ethics of care and gratitude towards life and the environment are widely recognised amongst many indigenous cultures (Berkes, 2008). These cultural examples offer great insight and tools for Western educational approaches to decolonize toward partnership.

This is not to say we should blindly adopt or appropriate other cultures' views and practices or view indigenous cultures as one idealised model for living. There are and have been many forms of indigenous cultures, some of which were not adaptive (Diamond, 2011; Nash, 1978). Like any other society, indigenous peoples (have) struggle(d) with living within the boundaries of place - and are not necessarily the perfect ideal - which is sometimes popularly presented (Berkes, 2008). Many indigenous cultures, such as the Masai of 19th century East Africa for example, have developed dominator-oriented cultures (Eisler, 2002). This is however not a disappointment for it helps us to overcome dualistic notions of traditional and modern in search of sustainability. It is perhaps more helpful to look at societies within the spectrum of domination and partnership as fundamentally different responses to survival which affect human-environment relationships (Eisler, 2002). A focus on domination may have served short term survival of groups in times of stress. In reality, all cultures contain patterns of partnership and domination, but to different degrees. Cultural transformation theory stresses that both aspects are part of humanity. But the capacity to empathise with other beings and perceive long-term consequences of one's actions is an important adaptation that needs to be nurtured through cultural practice at various levels, in the spiritual, cognitive, emotional and physical (Eisler, 2002; Eisler & Fry, 2019). Indigenous cultures can help the 'Western' mind to question itself and re-member its own ancestral wisdom which has been buried along the way. Like in the prophecies of some North American Indians, the younger brother (technological cleverness) should return from his solo adventure and reconcile with older brother (ancestral wisdom) (Four Arrows; 2013).

In this research I explore how partnership cultural expressions in North American indigenous traditions can inspire and inform the development of transformative learning pathways in Western higher education as part of a transition to partnership cultures. I have chosen North American indigenous traditions as a focus point for this study because they embody many partnership aspects which are well described in (native) literature. I am also most familiar with these traditions through earlier personal experiences. Among NA indigenous cultures, living, knowing and learning are not clearly separable entities, therefore I study them together to make sense of learning pathways for partnership. The research will take place in an action-oriented setting because the field of transformative learning is in need of practice. I was given the opportunity to use an existing course at my university to research how learning ways inspired by indigenous learning can be enacted in a standard higher education format. The trajectory of transforming an existing course is also insightful if other courses are to become relationally based. I chose to apply these insights to the context of higher education because I could, but also because it is perhaps the world of science that is in most need of transformation. I find it an interesting challenge to bridge the world of science with an indigenous way of learning, as these worlds seem so contradictory. I find myself on the edge of these worlds also.

My main research question is:
- *How can North American native ways of living, knowing and learning inform the design of partnership education in the context of Western higher education?*

Sub Questions:
- *What are important beliefs and practices of partnership in North American native ways of living, knowing and learning?*
- *How can we translate these insights into learning practices for partnership learning in contemporary Western higher education?*
- *How does this contribute to qualities of partnership among participating students?*

In the first part of the research, I will explore key beliefs and practices of partnership among North American ways of living, knowing and learning. In the second part, these will be guiding the formulation of pedagogical steppingstones for the redesign of the course *Ecological design and permaculture.*
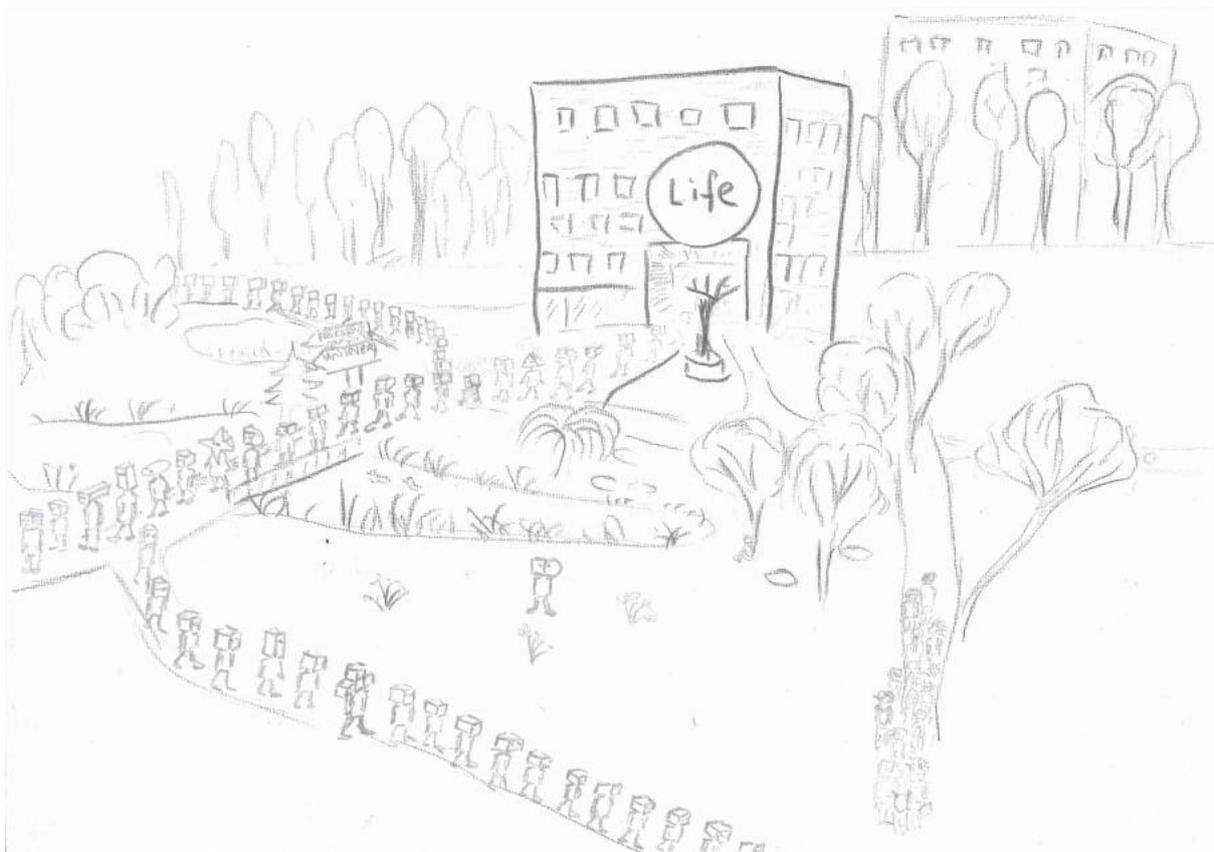
2. Theoretical framework

2.1 Cultural transformation theory

In this thesis I use the conceptual tool of *cultural transformation theory* formulated by Eisler (1987). This theory is developed from interdisciplinary study of ancient European history. Eisler's theory finds its base in archaeological studies and the study of ancient writings of an area spanning from Western Europe up into the Middle East, where evidence is found for a fundamental shift in culture from partnership to domination from around 5000 BC onwards (Eisler, 1987; Gimbutas, 1977; Mellaart 1975). Eisler locates the cause of this shift in a series of invasions spanning several thousands of years. From the arid regions were composed of patrilineal, socially stratified, herding units which lived in more seasonal settlements. In mythology, Kurgans praised heroic warrior gods and glorified the dagger, battle-axe and blade as symbols of power (Gimbutas, 1977). Later other invasions such as the Hebrew tribes from southern desert regions reinforced the development of a domination culture. Excavations from before 5000 BC in various locations show evidence of a thriving culture, based on a (semi) sedentary, horticulturist livelihood, with technological specialisation, complex governance structures, advanced architecture and flourishing culture of arts and mythology (Mellaart, 1975; Gimbutas, 1974). Findings suggest matrilineal or matrilocal systems. What is most interesting is that over an area spanning from Western Europe into the Middle East, arts and religious objects consistently depict the explicit honouring of women, femininity and nature in the shape of clay statues and imagery of the Goddess (Eisler, 1987; Gimbutas, 1974). Also other recurrent elements such as the chalice and the serpent symbolise a devotion to the mysterious, cyclical, life-giving forces of fertility but also death.

The historical analysis of invasions has been debated and new insights propose a theory of cultural diffusion and social reorganisation during agricultural developments at the time rather than violent invasions (Sharma, 2005; Harari, 2015). However, the spectrum of domination and partnership as modes of organisation within cultures is still a valuable frame to understand cultural transformation. The idea that partnership models have been the prevalent structure within prehistoric matrilineal societies has not been entirely refuted (Collard, 1989; Goodrich, 1989). The analysis of a cultural shift from partnership-oriented cultures towards an emphasis on domination in European's overall history persists and aligns with ecofeminist theory (Radford Ruether, 1974; Shahjahan & Haverkos, 2011; Salleh, 1997). Central to this analysis is a process of colonisation of the soul, body and mind of peoples by a dominant class which persists till this day (Riley-Taylor, 2002). Similar shifts in cultural development have been found across the entire Eurasian continent up to India and China (Macy, 2007, Jiayin, 1997). Other studies also find the cultural forms of domination and partnership as fundamental modes of organisation, although they are termed differently (Maisels, 1999; Hartman; 2004; Levine, 1997). The growing study of matriarchal studies supports the theory of partnership and domination as expressed in systems of patriarchy and gylany (equality of the sexes) (Goettner-Abendroth, 2017).

As introduced earlier, transformation theory holds that societies unfold somewhere along the spectrum between domination or *'power over'* as main organising cultural principle and partnership or *'power with'*, two principally different modes of being in the world that structure relationships,

with oneself, one another and the non-human environment. Dominator cultures known in history are characterised by the principle of *ranking* - which is expressed into hierarchical social organisation, inequality of the sexes and what have been named 'feminine' or 'masculine' cultural aspects. The principle of ranking is also expressed in cultural narratives about the world and our place in it, influencing self-identity and moral codes of conduct relating to each other and the world around. Part of this scheme is an instrumentalist approach towards both people and the non-human world (Eisler, 1987; Riley-Taylor, 2002). On the other side of the spectrum we find partnership cultures which build on the principle of *linking*. Linking is expressed in horizontal social and gender relationships and a striving to include and balance 'feminine' or 'masculine' cultural aspects in both sexes. Among contemporary partnership cultures we can find a cultural narrative of reciprocity or interbeing which is not necessarily romantic but inclusive of divergent powers and experiences of life. This is practised through cultural traditions that stimulate appreciation for and a participatory relationship with the non-human environment. In all cultures, both ranking and linking principles are present in cultural organisation and are expressed in complex mixtures of these cultural archetypes. However in the current globalisation Western culture, the principle of ranking is too dominant and causing disequilibrium in both social and ecological systems (Eisler, 2002; Riley-Taylor, 2002). Cultural transformation theory offers a basis to believe that partnership culture is possible and that also Western society has its roots in such a culture. It offers hope against the long standing popular believe that slavery, violence and male dominance were simply the status quo throughout human history.

In this research I found Eisler's cultural transformation theory a supportive framework for orientation in 1) the wide diversity of interpretations of the historical causes of the Western instrumental culture and disconnect from nature, and 2) the wide diversity of approaches to transformative learning that aim to transform these historical tracks in today's society. In a conversation with one of my supervisors in the beginning of this research, we wondered what transformative learning really aims people to transform to. It has been my aim in this research to search for a deeper layer of transformation than is usually proposed in explanations of instrumentalist culture as a result of the technological revolution, Christianity or Enlightenment philosophies. I find that cultural transformation theory places these problems within a more existential perspective of survival and the evolution of human consciousness which are played out differently in responses of domination and partnership. At the core of this I see the struggle of humanity to deal with uncertainty of life consciously. This is existential and emotional, not just technical and philosophical. This resonates with ancestral spiritual perspectives that view the struggle of humanity as dealing with two main forces, compassion and fear, which are part of a process of healing from our separation with the One (Patel, 2016). I also found it resonates with many indigenous perspectives on the state of our world today (Four Arrows, 2014; Waitaha, 2006).

Eisler's analysis also played an important role in my personal process of coming to terms with today's crisis. It has also helped me to overcome some unconsciously internalised ideas that humans are just inherently cruel and that there is no hope for another world. But also the ingrained feeling that Western culture is so divided from others, somehow not indigenous, foreign and not belonging to this world. And that I cannot belong to this world. As a Western person becoming aware of my culture's impact on the planet and feeling the immense cruelty of our practices, it has helped me to view this within an historical perspective that is forgiving. And hopeful in the sense that European

and other peoples have known a state of connectedness in history and still remember this in parts of our life today. It has been an important step for me to view that all peoples in history have struggled with the existential uncertainties of life and have not always managed to respond in adaptive ways. This realisation has been an important step in a personal process of dealing with the pain of the world and searching for a ground of sustainability in humans and myself. This has been an important part of a healing process for me, which I believe is central to our transformation towards partnership. This is itself insightful in exploring transformative learning, which largely leaves unrecognised the emotional and existential level of transformation in its focus developing skills and competences.

In the next section I will dive deeper into European history to understand how hierarchical relations developed in the social, spiritual and ecological space through the dynamics of domination. This analysis is a simplification of events, as historical developments are complex and locally varied. However, it helps us to make sense of domination and partnership patterns, thereby offering an orientation to feel where we are standing as Western society, where we come from and where we could be going. This will serve as a contrast to understand cultural aspects of partnership in the findings from North American indigenous cultures. In the section following the historical analysis I will dive deeper into the cultural patterns of domination and partnership as existential/spiritual responses to life. Lastly, I will discuss how this relates to transformative learning approaches in higher education.

2.2 From anciennity to modernity - a quick ride through the cultural evolution of Europe.

Antiquity

One of the most revealing cases of partnership society is the Minoan society of Crete around 2000 BC. There archaeologists found vast multi-storied palaces, villas, farmsteads, districts of populous and well-organised cities, harbour installations, networks of reads, organised places of worship and planned burial grounds (Platon, 1966:15). Social structures and values of this culture reflect a spirit of equality. The standard of living seems to have been high, little evidence is found of poor living conditions. The presence of well-built drainage systems and sanitary installations suggests that these public works were paid out of royal resources. Although there were weapons, art did not idealise warfare like in many other cities. There is an absence of grandiose scenes of battle and hunting. In artist expressions, one finds imagery of and symbols of the Goddess and joyful partnership between men and women. Both men and women were known to participate in sacred bull games, where they would work in teams to grasp the horn of a charging bull and somersault over its back (Higgins, 1973). Music, singing and dancing were prominent in Minoan culture and clothing styles indicate a freedom and celebration of expressing sexuality (Hawkes, 1968). Women had high social, economic, political and religious power and are often depicted as priestesses in ceremonial religious settings. There is ample evidence that succession passed through the female line (Platon, 1966). Also the Goddess herself with a double hoe axe symbolising the bountiful fruitfulness of the earth is depicted in abundant depictions of n*ature (Eisler, 1987).* In Platon's words, Minoan art was a *"delight in beauty, grace and movement"* and in its "*enjoyment of life and closeness to nature*" (1966:148, 143). Palace art is fundamentally different from what has been found elsewhere, in being aesthetic rather

than monumental, an expression of refinement and love of life rather than a showcase of power. All the artistic media express an all-pervasive ubiquitous religion that included all life in its totality, as well as death (Buchholtz & Karageorghis, 1973). According to Platon, "*the fear of death was almost obliterated by the ubiquitous joy of living*" (1966:148). The excavation site of Catal Huyuk in current day Turkey shows similar patterns of organisation (Mellaart, 1967).

By 5000 BC the first signs of disruption became visible in archaeological findings in the near East, it seemed to have reached Crete much later (Mellaart, 1975). However, there is also evidence of natural catastrophes (Eisler, 1987). This process of invasion remains speculative, it is therefore more meaningful to look at later cultural developments of the Greek and Roman cultures to understand the manifestation of domination-oriented relationships in early European history. In the period from 5000 BCE until 500 BCE, it is through that a mixed culture emerged which increasingly turned towards a dominator culture but still included worldviews, knowledge, skills and aspects of the Goddess cultures. This is for example evident in the concept of democracy, which some scholars think was developed from earlier clan decision making, however in ancient Greece excluded women and slaves (Eisler, 1987). Despite the presence of partnership culture in the cultures of old Europe, the new order of 'power over' was reinforced in political and economic hierarchies as well as mythologies. With it came also the shift from the old communal or clan owned system of property related to the concept of commons, to a system of private ownership in which women, slaves, children and land were suddenly part of property instead of community (ibid). Ancient Greek elite culture reflects a preoccupation with war and 'manly' virtues of heroism, armed conquest and the humiliation of women in plays, art and historical text. Berman writes how a sharp break occurred in Greek cosmology from a participatory consciousness and ontology of interconnectedness in the gradual disappearance of spiritual animism (1981). The rise of Greek mythologies of unpredictable and often armed deities of the Olympian pantheon appears to represent a legitimization of the chief kingdoms of the new male dominated ruling order overtaking the earlier matriarchal organisation and Goddess culture. Zeus establishes supremacy through acts of cruelty, including many rapes of Goddesses and mortal women.

One of the most performed Greek plays, Oresteia, fascinatingly displays the cultural genocide of the Goddess culture. In the last part of this play Orestes stands at the trial for the murder of his mother, where Apollo defends the case by explaining that *"the mother is no parent of that which is called her child… She is only nurse of the new planted seed that grows". "I will show you proof of what I have explained,* Apollo continues. *"There can be a father without any mother. There she stands, the living witness, daughter of Olympian Zeus, she who was never fostered in the dark of the womb, yet such a child as no goddess could bring forth"*. At that point the goddess Athene, who sprang forth from the head of her father Zeus, enters and confirms Apollo's statement. *"There is no mother anywhere who gave me birth*, she asserts, *"and but for marriage, I am always for the male with all my heart, and strongly on my father's side".* The story ends with the Eumenides, representing the old order, exclaim in horror, *"Gods of the younger generation, you have ridden down the laws of the elder time, thorn them out of my hands"*. Athene casts the deciding vote; Orestes is absolved of any guilt for the murder of this mother. (Aeschylus, 1953:158 quoted in Eisler, 1987:78). The role of Athene, being a direct descendant of the Goddess, declaring male supremacy shows how masterful this piece of cultural diplomacy is in the establishment of the male-dominated order. If she accepts it, then it should be by every Athenian.

Also in political and philosophical writings, we find increased legitimization of ranking of strong over weak - ruling over the ruled, based on the premise that human beings are essentially ruthless, self-centred animals and thus forceful rankings are merely natural and right. Morality is thereby just an expedience (Robinson, 1958). The culture of ranking is also reflected in philosophical works such as Aristotle's who established that only men have the access to the pure spheres of thinking and being, while women are thought to have an animal soul (Abram 1996:48). According to Aristotle, women do not possess the rational soul, and thus "the relation of male to female is naturally that of the superior to the inferior – of the ruling to the ruled" (*ibid*). Aristotle and Plato, applied the principle of ranking also to the natural world, placing minerals, plant, animal and human life in increasing order of complexity and supremacy (*ibid).* According to Plato, there was nothing to learn from the land, only from other people (Robinson, 1958). However, aspects of partnership culture remained present as well. This is visible in the works of pre-Socratic philosophers such as Xenophanes, Thales, Diogenes and Pythagoras seem to base their philosophies on assumptions rather akin to old religious cosmology of the Goddess. She was worshiped in many forms, among which a more abstract representation of the source of all nature and life, a coherent and cyclical force or a 'goddess of opposites' encompassing the dynamism of both creative and destructive powers, birth and death, or male and female opposites in the form of androgynous images (Eisler, 1987: 110; Neumann, 1955). There is vast evidence of female poetry and scholarship, especially from the islands where for a long time still the old culture had persisted. Two of Plato's best-known pupils have been women, and Pythagoras received most of his ethical teachings from a woman, a priestess of Delphi. It is perhaps not a coincidence that many philosophers also came from these islands (Eisler, 1987).

The rise of early Christianity was in fact a liberation movement for partnership values of peace and equality. However, under the powerful influence of ancient priesthoods it was coerced into another form of repression (Neumann, 1955; Eisler, 1987). As members of the male elites and the state power, these priesthoods spread the Word of God through 'sacred' stories and rituals that systematically inculcated in people's minds the fear of unpredictable deities, for people had to obey their earthly representatives. Many Christian symbols however show important traces of the Goddess culture. As symbolised by the baptismal font or chalice, which was the ancient feminine symbol of the container of life, early Christianity was an attempt for the regeneration of the Great Mother and its water of life (Neumann, 1955). The birthday of Jesus is in the time when traditionally the winter solstice was celebrated - the day the Goddess gives birth to the sun. And his resurrection in spring is thought to represent the regeneration of nature (Eisler, 1987). However, coerced by the ruling powers, its symbolism became distorted with the imagery of crucifixion and death. Likewise, many old myths pertaining to the Goddess cultures were diplomatically rewritten and distorted in the making of the Old Testament, which is thought to be a compilation of stories made by the early Hebrew priesthoods (Gimbutas, 1982; Neumann, 1955, Radford Ruether, 1974). Slowly the memories of another time represented in myth, ritual and song were erased from cultural memory. How symbolic the story of Eve in paradise who listens to the serpent, which is a recurrent ancient symbol of life, eternity, renewal and spiritual wisdom across a range of early Eurasian cultures, and eats from the sacred tree of knowledge, thereby symbolising personal spiritual and moral authority (Gimbutas, 1989; Neumann, 1955). For not obeying the external authority of the higher male God she, and all of humanity for which she is held responsible, are cast out of paradise forever. And so

the promise for a better life after death for those who obey the father's commands becomes central. The narrative of original sin offers a basis for perpetual fear and a power dynamic of dependency.

Middle Ages and Renaissance

In Europe, the structuring force of organised religion continued to play a major role in the manifestation of a domination-oriented culture through rather extreme violence and suppression for another millennium. Women and 'the feminine' have been explicitly silenced and subordinated during the Middle Ages. Well known are the witch burnings which, over several centuries, inflicted hideous tortures on thousands, possibly millions, of women practicing ancestral healing techniques because they threatened the Church instated upcoming order of male physicians (Faulkner, 1985; Ehrenreich & English, 1973). Although the mediaeval millennium has known various periods of gylanic resurgence, such as the Troubadour period in France, these were consistently followed by regressive periods where 'feminine' values were rigidly confined to the subordinate world of women and the private world of the home (Taylor, 1954)). Such resurgences would take place in times and places when women were able to move more freely into the public and as carriers of 'feminine ethos' and disseminate a more gylanic worldview into society.

Ancestral ways of perceiving and treating nature as sacred were also explicitly condemned by the Church as God's power was not to be found in the earthly matter accessible for all but only through the position of high priesthood (Knippenberg, 2010). The 'pre-Christian peoples in fact held worldviews like ones of many indigenous peoples elsewhere in the world, of *"an ultimate unity and a reciprocal penetration of nature and mankind, organically organised with each other and interactive,..., i.e. direct participation in the cosmos. People assume that they can have immediately magical influence on the world"* (Gurevitch quoted in Knippenberg, 2010:34). Key understanding of life to these peoples was spiritual, based on interrelationship and complementarity. All has life and is interlinked (ibid). The condemnation of this *"godlike, spiritual, supernatural or 'magical' way"* of interacting with the world can be understood as repression of spiritual autonomy and power of the people, like the story of Eve in paradise (Knippenberg, 2010:35). Indeed the story of original sin was used to legitimise this oppression; humans were not to be trusted with the responsibility of understanding and guiding themselves (ibid). One can imagine how traumatising and disempowering this violently imposed message has been. People were robbed of the possibility to interact with nature in a spiritual way and experience 'power with' or 'power from within' that is foundational to partnership culture (Starhawk, 1994). The image was imposed of nature as an expression of God, but not as something knowable for mortals. God determined everything and gave everything meaning but his mystery could not be grasped by the human mind. Only through supernatural revelation practices by the higher order.

When the works of Aristotle re-entered European philosophy in the 12th century through Islamic trade, a revolution in thinking about God and nature set it. Aristotle's work acknowledged God as the prime mover but also offered ways to dissect and study the workings of natural phenomena, in order to discover their *telos*, final causes. Aquinas (1225-1274) built on this, proposing that the universe could be understood through rational examination as well as through grace and natural insight (the study of nature) because nature was an expression of God (Knippenberg, 2010). This was essentially an emancipation, because human reason had now *not* become untrustworthy due to original sin and God's freedom to do as he pleases (overruling his own order/truth) was diminished.

The position of nature became almost equal to faith as it disclosed the mysteries of God but at the same time it became an object that could be rationally understood and studied. This approach gave way to tendencies to differentiate between the workings and outcomes of natural processes and God's intentions. In the centuries up until the Renaissance, the belief in rational observation gained power and grew apart from faith as a way of knowing God. The role of God in nature moved to a more abstract place of the Prime Mover (ibid). Philosophers like Kant and Locke finally placed faith in the private sphere, avoiding conflict with the Church (Shahjahan & Haverkos, 2011). This rational way of interacting with Nature was a way to escape from the corruption of Kings and Church and emancipation for a more independent authority over knowledge and truth. Nature and spirituality were now almost fully divorced.

Descartes emphasised the separation of the thinking mind, the subject, from the material world of things or objects. This view was influenced by the work of Galileo, who asserted that only properties of matter amenable to mathematical measurement are real; the rest being mere illusory impressions: *"This grand book of the universe... is written in the language of mathematics, and its characters are triangles, circles, and other geometric figures without which it is humanly impossible to understand a single word of it; without these, one wanders about in a dark labyrinth"* (quoted in Abram, *1996:32).* The earlier Church view that human senses and understandings were distorted by the original sin seems to remain present in these philosophical developments. It also reflects a sentiment of fear for the mystery of the universe, and maths as an attempt to retain control. Although faith in God remained acknowledged as important and true at least as belief, feeling or sentiment, logic became the main instrument of knowing and acting ethically (Kippenberg, 2010). These developments laid the foundations for positivist and also the "disinterested sciences"; a so-called value-free operation that could lay bare the mysteries of life as if we are not part of it. The success of the early natural philosophers at exercising control over nature resulted in the industrial revolution, where technology increased efficiency in natural resource extraction and human productivity (Mendelsohn, 1976). These developments strengthened a belief in continuous progress led by technological advancement, positivist science and division of tasks in increasingly specialised societal domains (O'Sullivan & Taylor 2004; Latour 1993). With it came another restructuring of society, replacing community and land-based structures into urban ones, disconnecting people from their local context and shaping lifestyles based on the rhythms of the running machines.

Modern times

In view of this history, today's pillaging of the earth for short term prosperity and the overall loss of partnership culture is seen as a long-lived continuation of 'power over' culture. Viewpoints that place the problems of our time within the frame of technological or philosophical developments do not recognise enough the violence - both of body, soul and mind - that has affected Western cultural development for millennia and into the present time. A process *"whereby the human mind was remoulded into the new kind of mind required by this drastic shift in our cultural evolution"* (Eisler, 1987:83). A process that has come with continuous suppression, initially physical, later through the new social order and its spiritual education. The realisation that this trend of colonisation has proceeded into modern times and played its role in shaping the modern routines of being in the world at all levels of existence is key to understanding transformation for/as sustainability. Colonial invasion is indeed not an event, but an ongoing structure which continues to deeply affect our self-understanding and the ways we live and think (Wolfe; 2006). Western culture was never built for

sustainability. The very foundation of a 'power over' organised society does not embody *'an intention toward life'* as a whole but perceives life as a resource for its own isolated individual continuation (O'Sullivan & Taylor, 2004:1). It is this instrumentalist way of being that is central to our crisis.

The modern age has also regenerated many 'partnership' aspects in the Western world, such as the emancipation of women, weak and disabled, a right to study and vote for all, personal freedom and in recent decades a renewed consciousness of the well-being of the environment. However, looking deeper, domination structures are also still in place. The fact that this view is still not discussed in mainstream schooling is telling of the power of patriarchal culture. Although rationalism worked as a liberation initially, without the guidance of heart it has by now become equally destructive as empowering. We can recognise this in the various ways that Western society has come to relate to other life-forms, but also to each other and to the self; whether in endless experimentations with humans, animals and plants, the top-down manipulation of ecosystems, the feverish counting and measuring of things, in the ways that non-Western peoples are still held in colonial structures of dependency, in the way that the 'feminine' and the 'other' are still subordinated, or in the mechanical models of psychology and health where the relation of body and mind remains largely unspoken of, and in how our educational systems are organised (Latour, 1993; Shiva, 2001; Macy and Brown 1998; Riley-Taylor, 2002; O'Sullivan, 1999). And although women hold more powerful positions, this is often achieved by adopting 'masculine' aspects of being invulnerable, rational, strong and decisive, as a way of defending male values in public space (Way et al, 2018). Way et al. recount how strongly the dualism of masculine and feminine values is imposed on the sexes - where men are taught to think and lead, women only to feel and comply - and how values of care and empathy have publicly diminished in the last decades - proclaiming our time as a *crisis of connection* (2018).

Although many people would not necessarily see themselves as a ruler, through the cultural routines of modern life we are drawn automatically into instrumentalism. Today's technological advancements and hedonist seductions only draw us deeper into its efficiency. Like rationality, the idea of 'progress' had initially been emancipatory as it offered a way out of the Church imposed idea that God and fate governed the order of the day. Capitalism had also offered a way out of rigid class structures and their material resources (Eisler, 1987). However, both have become powerful justifications of global exploitation today (Shiva, 2001). Emancipatory movements seem to end up being co-opted by the ruling order - much like the concept of sustainability is being used to greenwash exploitative practices. According to Eisler the sometimes-violent reassertion of domination culture, such religious fundamentalism, the corrupting influence by transnational corporations of enormous economic and political power, or the increase of mass violence in popular culture and media, are only defensive responses to the powerful resurgence of partnership. Historical developments consistently show this trend - that when a resurgence towards partnership becomes too powerful to contain it is countered by a period of violent suppression and cultural regression (Millet, 1970; Winter, 1973). Never before has the movement for partnership had such power as today (Eisler, 1987; Capra, 2012). This can be recognized in worldwide movements against racism, colonialism and inequality of the sexes, the growing awareness of sustainability issues, or the resurgence of indigenous voices both in politics and popular culture and a shift towards more relational perspectives in various scientific disciplines (Capra & Luisi, 2016). At this moment in time,

we find ourselves at an existential bifurcation point where the level of modern technological development can either "*lead to an era when the culminating use of human creativity and technology could be the realisation of our unique human potentials. But there is another possibility: that a dominator cognitive cultural map will at our level of technological development lead to the human extinction phase, the end of our adventure on this Earth*" (Eisler, 2002: 170).

2.3 Domination and partnership as existential responses to life

In this history, the organising principles of domination and partnership have been strongly tied to the sexes and categories of masculine and feminine. It is important to note that they are not literally tied to the sexes, as both men and women can act and live from both positions. In this research they are mostly used as metaphors for naming modes of social organisation connected to worldviews as being relationally based or hierarchical (Fromm, 1986).

Eisler theorises that both cultural types express two fundamentally different ways of surviving. The dominator culture developed mostly among the peoples living in ecologically poor regions of Eurasia, thereby necessitating a strategy of short-termism, take-what-you-can and strict social divides for resource distribution (2002). Partnership cultures seem to be more related to places and periods of abundance or long-term place dependence. Gilbert (2009; 2017) describes a simple model of basic emotional regulatory systems in humans which serve our survival. One is a response system that reacts to danger and stimulates responses such as aggression, fear, judgement - otherwise known as fight, flight, freeze. A second one is a hunting system, which stimulates goal-oriented behaviour, arousal, longing and consumption. The third one is a care system which when activated stimulates calmness, a sense of connectedness, empathy for oneself and others, caring behaviour (ibid). Although human behaviour is vastly more complex than this model represents, it offers a valuable perspective. When humans live in continuous stress due to environmental or social conditions, the danger and hunting systems are continuously stimulated - to a point where there is no safety to relax into a care mode. When being in such a state for a long time, one develops coping mechanisms that can become ingrained into one's being, sense of identity, personality, worldview and physiology. It is known that trauma is intergenerational and is reproduced through culturally ingrained patterns of social conduct (Way et al, 2019). Groups of people living in high stress mode over generations can develop cultural tissue that sustains and reinforces this mode of being - it becomes an existence. Among native American peoples, this was an important understanding. McGaa writes that in their view, fear and love are seen not just as emotions but as energies with particular designs/patterns that prefigure worldviews. It is important that neither of these is blocked or perpetually dominant, so they can flow in a self-regulative way (Ed McGaa & Fischer, 2013).

In this light, domination and partnership can be understood as survival strategies that arise in relation to presence or absence of stress, and dependent on the cultural ability to respond can develop into patterns of existence. The stories of oral indigenous traditions support this idea that human societies fluctuate between states of stress and abundance, which can become ways of life over long periods of time (Jiayin, 1995; Ni, 2004; Waitaha, 1994). This view is expressed in various ancestral telling's that refer to cycles of 'awakeness' and 'sleep' in human consciousness. The

challenge for all peoples is to 'remember to remember' what they call their 'original instructions' (Wall Kimmerer, 2013). These are not literally instructions, but rather a spiritual orientation that sustains people to live in a balanced relationship with the world. What 'balance' means in different circumstances is for people to find out, but it revolves around an intuitive understanding of the cyclical, chaotic nature of the universe and how to live within its creativity (Cajete, 2000; Waitaha, 2006). In times of crises, it is easy to forget the bigger picture of existence and react on short-term incentives for survival. It is the cultural tissue of stories, rituals and ceremony that should help people to remember the way of the heart in difficult circumstances, or at least return to it after crisis resides. The people who do not return and forget the larger web of relations have been called broken peoples in some indigenous voices (Waitaha, 2006). Also in other NA indigenous traditions, there are terms to differentiate partnership and domination types of cultures, such as sharing peoples and angry peoples (Underwood, 1993), those who remember their origins and those who do not (Hand Clow, 2001) or progressive and regressive societies (Mc Gowan, 2008). In the eyes of NA indigenous peoples, Western society is one that has lost its sense of relationship, which has resulted in a continued crisis of identity and its cosmological relationship to the natural world, fabriquating technique without soul and knowledge without context (Cajete, 1997). In the eyes of many indigenous peoples, this is perceived as a dissociated, pathological state of being (Manitonquat, 2009; Bastien, 2004).

The domination partnership culture can thus be seen as expressions of different ontological positions. These two modes of being in the world, partnership and domination, align with what philosopher Mathijs Schouten calls centrifugal and centripetal; the first embodying an open mind, receptive to other beings, perceptions and voices, while the latter embodies a self-indulgent way of being, absorbed by the self and its needs, using everything as an instrument for its own sense of safety (Schouten, 2000). Sustainability is then an existential act of balancing two aspects of our being, that is being 'one' in two different ways at the same time - one with everything and one, an individual. Just like light is both particle and wave at the same time. Research on the practice of compassion for well-being and constructive relational behaviour shows that balancing of individual sense of self and larger self is indeed key to human functioning, and that practice is important to sustain balance. These viewpoints allude to a spiritual understanding of sustainability. Human(-nature) relationships essentially come down to the question: "who do we think we are?" (Schouten, 2000). It is a challenge of being in the world as a species that has become conscious of itself and its surroundings and needs to self-regulate on the basis of that. As a highly sensitive species with a strongly developed reflective consciousness, we are enabled and required to build mental images and to formulate values, beliefs, goals and strategies. This cultural mythos plays a fundamental role in learning, adaptation and survival (Cajete, 1994). However, building this mythos is not a straightforward task being subject to ever changing complexity of emotions, anxieties, images, intuitions, thoughts, powers and relationships. It seems that in the face of this challenge that societies can take different routes.

Eco-philosopher and Buddhist scholar Joanna Macy, relates different reactions to the struggle of life to four archetypical worldviews that can be found in historical documentation of Asian spiritual texts and arts (Macy, 2007). The first of these is the world as battlefield; a view in which life is seen as a battleground of good and evil, forces of light and dark struggling against one another. A view that arouses courage and fiery energy to defend one's cause against 'the enemy'. Its power lies in giving

certainty that you are part of the larger cause, fighting for a high ordained good also called the 'apartheid of the good'. The often-felt self-righteousness of environmentalists of other activist movements can also be viewed within this frame. It is also expressed in images of climate change and unpredictable weather patterns as vengeance of mother earth. The duality of good and evil gives a sense of order, belonging or direction and allows an escape from the fuzzy, confusing reality. This view on life is recognizable in the adoration of violence in various cultures past and present.

The second view is that of the world as trap. In this view the goal is not to win the battle but to escape the confusion and unpredictability of the world. The idea of a pure place where there is clarity, truth and peace gives a sense of order and control. Macy finds this view expressed in the separation of mind and nature, spirit and flesh, reason and emotion. She observes how these dichotomies have penetrated all major religions of the last 5000 years, as well as the sciences. This view is expressed in the origin story of Adam and Eve, where paradise and earthly life have become separated through Eve's sin. It is a pitfall in many spiritual traditions, where the tranquillity of spiritual practices is sought to escape the suffering of bodily life. The metaphysical dichotomy between pure consciousness and matter is tied to a vision of spirit struggling to free itself from the toils of nature (Macy, 2007). This view is found abundantly in early Hindu philosophy, which like early European culture, arose from a mixture of Goddess worshipping societies with more domination focused cultures. The Goddess re-emerges centuries after there seems to have been a cultural shift in various images and terms, but consistently symbolised as the unconscious, dynamic creative power of the world. She is both fertile, arbitrary and cruel. The spirit, "*is made flesh in the womb of nature…but matter binds; and like any mother, is unwilling to let her son go free; hence she does all she can to deceive him; as such she is maya which, at this stage of the language, means both creative power and deceit* (Zaehner R.C. in Macy 2007:71). In this view, the archetypical mother is viewed as polluting and relentlessly binding to the opposing force of the free psyche, which elicits a response of powerlessness expressed in both rebellion and possession. *"Spirit rebels by subjugating matter, be it by mortification of the flesh or defoliation of the land. It seeks to possess mother by accumulating and consuming her goods and resources, her children. Either way, matter (mater) exerts her power."* (Macy, 2007:71). The physical force of nature that both creates and destroys, is feared and reacted upon with suppression and possession. We want to exert power over it. Hence the aggressive suppression of life-giving and other uncontrollable forces such as emotion, intuition and spirituality which have been equated with femininity.

The other two archetypical worldviews that Macy describes are world as lover and world as self (2007). Like battlefield and trap, they are variations of a theme. In this view, the world is experienced as a life-giving partner and living as a dance of mutuality. In Hindu culture this was expressed as an erotic relationship between Prajapati, the sacred self-existent one and itself, which was created after splitting into two so it could copulate with itself and pregnant with potential give birth to all phenomena. The ancient Goddess religions also carries such erotic symbolism, so do spiritual strains of Christianity, Sufism and the Kabbalah. Underlying this view is the awareness of and wish for the possibility to find a sense of union with the world - to experience the world as self. Mystics of all traditions give voice to this deep inner knowing and various indigenous traditions around the world *'know the self as one with its world'* (Macy, 2007: 27). Nature is viewed as vibrant, alive and mysteriously whole. A sacred life force runs through everything, including humans, and connects all (Cajete, 2000; Aikenhead & Michell, 2011; Berkes, 2008). Both fate and identity are seen

as interwoven with all beings. In this view, each being is also still a differentiated entity, however it does not exist independently. Everything emerges from relationships and every being is more like a temporary node in a dynamic web. This view that all phenomena are related is inherently underlying the many verb-based languages of indigenous cultures in which everything, including elements, have spiritual agency (Aikenhead & Michell, 2011).

The view of the world as self is slightly different in that there is less emphasis on the lover, but more plainly on oneness. Compassion takes place for the erotic. In Buddhism this view on life is expressed in the concept of dependent co-arising. About five centuries after Buddha, this insight is personified in an image referred to as The perfection of Wisdom or the Mother of all Buddhas. She embodies the wisdom of interbeing. Her image arose in a time when Buddhism got preoccupied with categorising and theorising the flux of dharmas, which are the ever fluctuating units of experience that aggregate and give a sensation of self. She was also referred to as *"gone beyond"* and offers no theories, only paradoxes such as *'The bodhisattva will go forth - but he will not go forth to anywhere'* (Macy, 2007: 63). The paradoxes offer release from self-adhesive logic and leave the observing ego with no safe place to stand. She is referred to as a caring mother who guides all to enlightenment eventually, but who offers no reassurance for the self. She is light, empty, both clinical and compassionate. She is a terrifying void, but if trusted one becomes *"like a bird that on its wings courses in the air. It neither falls to the ground, nor does it stand anywhere on any support. It dwells in space, just as in the air, without being either supported or settled therein"* (in Macy, 2007: 66). The Perfection of Wisdom embodies a release from existential fear, of trying to cling to some mode of being that gives temporary security and identity. It invites to give in and fall into interbeing. And perceive the things just as they are in the moment.

But she does not only represent a passive place of perception. In her imagery as Tara, her right arm is outstretched to help and her right leg, no longer in lotus position, extends forward, ready to step into the world. In other images, she copulates with her male consort, or 'other face' which is compassionate action. In her totality, she embodies both a view on reality as made up of two kinds of consciousness/energy or qualities, namely *prajña* and *upaya*, wisdom and skilful means, life's dialectic modes of vision and action. In this imagery, light and dark, male and female or energy and matter are no longer in opposition to one another. There is no cancellation of any pole, no ranking. There is simply consciousness which expresses in a passive and active quality, in dynamic interplay they create life. These qualities have in this case been represented as feminine and masculine, a recurrent symbolisation in other worldviews too. However, in this case they are set in a collaborative relationship. The fact that the totality of Perfection of Wisdom is feminine, has probably to do with the experience of enlightenment as a rebirth - falling through the illusion and re-emerging literally in a new world. This Buddhist archetype of the world as lover/self represents a reaction of the problem of life as 'giving in' to it, which is the bottom-line message of many spiritual traditions worldwide. Life 'as lover' does not necessarily mean that life is always gentle or good, but rather that its essence is 'productive' or generative. This is often referred to as a sense of sacredness. It expresses a sense of trust that life is meaningful although this is beyond our human understanding and evokes a sense of humbleness. The worldview of dependent co-arising holds an ethic of open-ended, compassionate participation in the unfolding mystery.

What emerges from Macy's analysis is the problem of uncertainty as both physical and spiritual, and the different positions people have developed to relate to it. Interestingly, chaos and uncertainty play a central role in ancient mythologies from all over the world (Cajete, 2000; Macy, 2007; Eisler, 1987). It is represented in the imagery of the Chinese dragons, yin and yang in the great Tao, the Egyptian sun Ra and Nun representing the great floodwaters of the universe, the serpent who sheds her skin and lives in the dark corners and various roles of the trickster, a sacred fool whose frolics remind everyone of the role of disorder in the creation of order (Cajete, 2000). This view on life is also recurrent in NA indigenous cosmologies. Much like the two kinds of consciousness/energy or qualities, *prajña* and *upaya*, chaos and creativity form the dialectic of movement and evolution, a continuous process of becoming. Everything that exists is in flux of manifesting and returning to chaos. Chaos and creativity are bound together as generative forces of the universe. This is an unpredictable, self-organising process. The survival of any self-organising system depends on its ability to be continuous yet changeable, and to keep itself open to the flow of energy and matter through it.
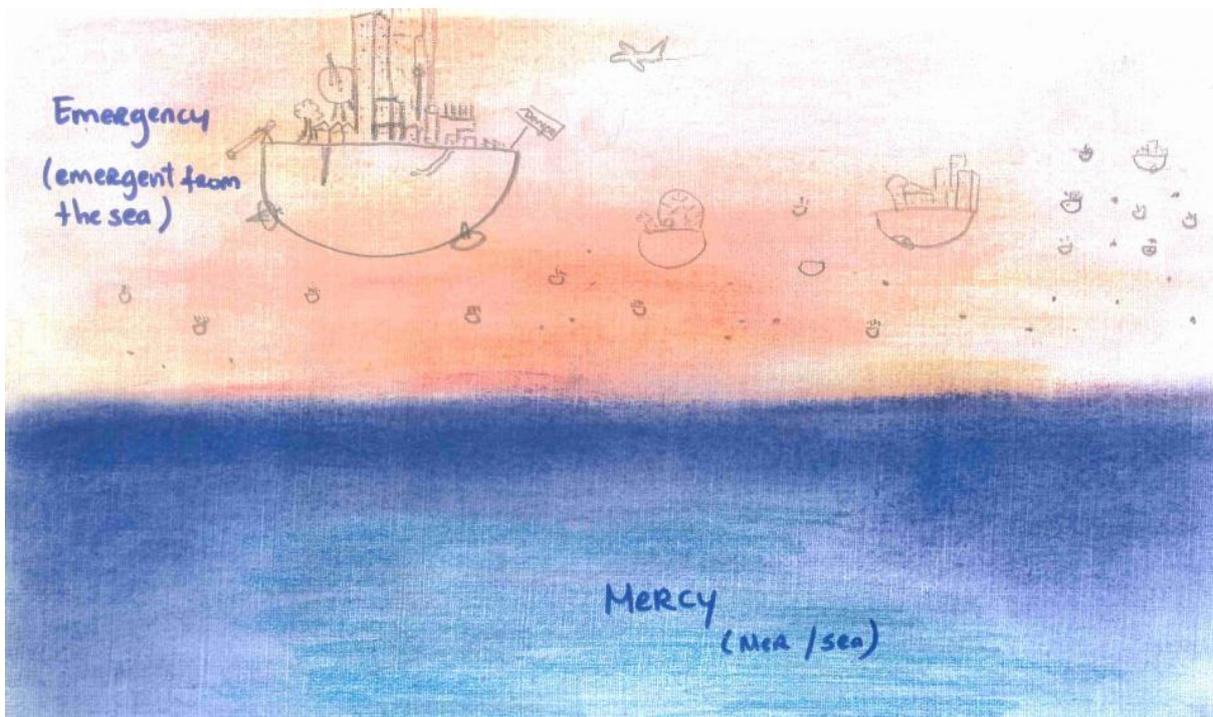
Personal illustration: an image that I received in my mind after an experience with being One reflecting the restlessness of a society as disconnected from One - always living in emergency. The sea for me often gives me this feeling of boundlessness. The sea is also used a metaphor to imagine the mysterious non-material energy of the universe. And water is traditionally considered a feminine energy, air and sky masculine. I found it funny how the words make sense. Mercy, bliss - but also merci in French - gratitude.

The philosophical underpinnings of Western science, although they have developed from a complex process encompassing many centuries, do show resemblance to Macy's conceptualisation of the world as trap. This sentiment is expressed in Francis Bacon's view of science as the *"the conquest of nature"* as a promise of *"liberation from the adverse conditions of existence which arise out of the prevailing state of the relations between [human] and nature"* (Leiss, 1972: 56). It also aligns with

Heidegger's reflection on science as an ideology of immortality, where the fear of mortality resembles the trap that can be outlived by science or culture, which build something of permanence instead (Sheets-Johnstone, 2003). The image that arises from this description is a society trying to separate itself from chaos, as if afraid to *live*, to enter in the mysterious uncontrollable process of life. *"This is a universe, we feel, that cannot be trusted with growth, rejuvenation, process. If we want progress, then we must provide the energy, the momentum, to reverse decay. By sheer force of will, because we are the planet's consciousness, we will make the world hang together. We will resist death"* (Wheatley, 1992:17). Fromm argues that this 'necrophilia' - a 'propensity for death' - increasingly characterises our culture as opposed to 'biophilia', a 'propensity for life' (1986:112-114). Fromm describes the *"necrophilous person as one who loves all that does not grow, all that is mechanical…He loves control, and in the act of controlling he kills life"* (cited in Freire, 1970/1993: 58). Rather than love for death I understand it more as fear for death which hampers love for life. This is not to say that science isn't also rooted in a love for life, motivated by a wish to explore the world and wonder about its beauty and complexity in appreciation. However, it seems that a long history of violence, war and dynamics of social inequality, have facilitated a cultural system of knowing and being that considers control and domination as central to its survival. But this reflects only one side of existence, being 'one' the material individual. The sacred sense of 'oneness' with everything offers a basis to 'remember-to-remember' a propensity for life as a process, including death. Partnership culture depends on the balancing act of both parts of existence. By including both in our way of being, we may develop a foundation for dealing with the dynamic forces of creativity and chaos with wisdom and skilful means, vision and action. When mastered, it offers hope for what appeared from Minoan society, "*the fear of death was almost obliterated by the ubiquitous joy of living*".
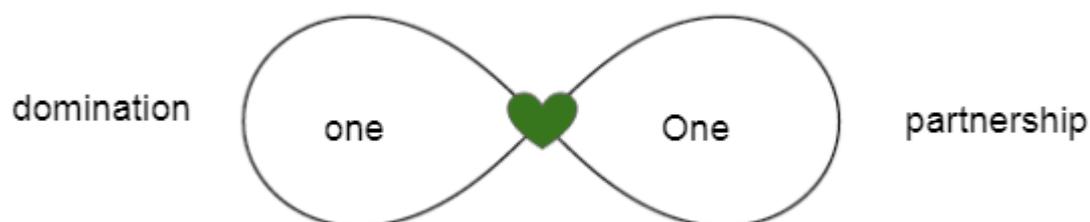
2.4 Moving forward: transformative learning towards partnership culture

Science and transformative learning in science education

Following from the above we can perceive the predominantly cognitive, linear and reductionist approaches in science and science education as a result of a long history of a culture focused on control through domination (Dei, 2000; Mignolo, 2000). In their historical analyses, Shahjahan and Haverkos describe how a 'secular fence of knowledge' has been created, which permits certain epistemologies and ways of being while leaving others at the gates of university (2011). Their analysis describes how a process of secularisation in science and knowledge has displaced the central principles of interconnectedness, reverence for existence and symbiotic relationship between male and female (Stewart-Harawira, 2005). The resulting culture of positivist science, founded on rationality and empiricism, makes it difficult to introduce partnership culture especially

in higher education as it thrives processes that are contradictory to the emerging onto-epistemology of relationality (O'Sullivan, 1999; Riley-Taylor, 2002; Wals, 2019; Orr, 2005, Capra, 2012). The scientific tradition supports an instrumental mode of being with an onto-epistemology that is strongly founded in a mechanical worldview, in which reality can be split into functional parts which are amenable to control and top-down regulation (Capra, 2012; O'Sullivan, 1999). It positions us outside the world we are living in (O'Sullivan & Taylor, 2004). The scientific ethic of privileging rationally obtained knowledge over other ways of knowing, such as emotional, bodily or spiritual, also places us outside the world, which we can only observe and measure, but not be in with all our senses. It does not allow much room to 'build relationship', which is oftentimes a felt, affective, spiritual process (Macy and Brown 1998; Naess, 2008; Spretnak, 1997; Way et al., 2018). Science's original emphasis on elite learning and ranking abstract knowledge over practical know-how remains the norm today (Mendelsohn, 1976).

The exclusion and marginalisation of spiritual epistemologies throughout history and persisting in current globalisation has also been placed within a project of domestication of Indigenous ways of knowing and being (Anderson, 2008). Here domestication is understood by Anderson as *"process of hereditary reorganisation of non-humans —into new forms according to human interests, which also entails a form of control whose subjects undergo profound behavioural and morphological changes''* (cited in Shahjahan and Haverkos, 2011:12). It finds a base in early Western concepts of 'animality' as distinct from humanity. The fence then works as an agent of domestication and civility, preventing the 'wild' from entering. Undomesticated plants are weeds, indigenous peoples are savages and emotions, intuition, metaphysical, and ancestral connections are 'wild' and dangerous. Embedded in this domestication process are ideas of *'control and improvement of wildness into services and products'*, based in an urge to 'breed' secular ways of being for material exploitation and profit (Anderson, 2008:487). The secular fence reproduces a secular way of being that is *'disembodied, universal and mobile'*, which serves to regulate the movement of capital, materials, knowledges and bodies (Berg cited in Shahjahan and Haverkos, 2011:12). In this view, the education system in the academy today is seen as space for herding and selectively breeding an elite group of future workers of the global economy (Spring, 2009). *"This artificial secular fence of knowledge is continually imposed on people's land, bodies, and minds, with the power to dispossess them of their spiritual identities and knowledge systems"* (Shahjahan and Haverkos, 2011:13). The fence has become normalised in present day academia, rendering it invisible until it is transgressed. Minds are unconsciously disciplined to enclose ourselves within the safety of the fence, limiting other ways of being in the word.

In this light, it is understandable that although there are a multitude of concepts and practices for transformative learning, it remains hard to deeply change the existing paradigm. The most dominantly used framework in higher education is that of Education for Sustainable Development (ESD) (Zylstra, 2014)). ESD is focused on developing key competencies in order to achieve the sustainable development goals, such as analysing and solving sustainability issues, envisioning a sustainable future, collaborative competence and taking action to contribute to a sustainable future (Wiek et al., 2011, UNESCO, 2017). Although these competences indeed foster a level of partnership and serve sustainability, the overall narrative is much about problem solving - training experts to deliver the technological fix - instead of nurturing new (or old) ways of participating in life that are regenerative. The educational vision of students as sustainable working professionals with a global

and future oriented perspective (Barth & Rieckmann 2012), reveals an uncritical view of colonial structures embedded in globalisation. According to Huckle & Wals and the Decade of Education for Sustainable Development which took place from 2005-2014, failed to challenge current paradigms and to foster global education for sustainability citizenship (2015).

Transformative learning in higher education is thus about deep cultural change within the science and science education institution (Riley-Taylor, 2002; O'Sullivan, 1999). It's not just teaching skills to students - it is joining an emancipation movement together (Macy, 2007). To transform the dualistic, power-over frame of fragmentary thinking, the education process needs to transform personal and communal ways of being and acting to become more relational, interconnected, place based and in balance with ecological systems (Macy & Young Brown, 1998; Orr, 1994). These transformations take place at the level of worldview and therefore include 'spirituality', understood as an activity of existential orientation. It should engage both teachers and learners in a communal process. Only certain groups or individual scholars are fully aware of our patriarchal history and its effects on how knowledge is perceived and produced today. It is therefore strange to generally expect teachers to teach paradigm change to students. Indeed, in practice it does not work this way (Sammalisto et al., 2015; Wilhelm et al. 2019). It is rather a co-creative exploration of other forms of learning, knowing and interacting with the world that is stimulated and facilitated by teachers (Riley-Taylor, 2002). Together they should enter into an open participatory process of questioning and sensing, experiencing other ways of being in the world that help to question and reframe unconscious attitudes and values (Baumgartner, 2001; Sterling, 2011). In the words of Orr, what should be 'drawn out' in the education process is 'our affinity for life' which can open us towards a sense of community and belonging, without which there is no basis for care relations (1994:205). Delpit suggests that commitment starts from the recognition that we have a place, in a larger whole, a family, a living community, a mysterious world unfolding (1997).

In light of our history, this process could be described as re-indigenization, in the sense of reinstalling relationships to community, to place, to land, and to foster cultural traditions that support a balanced way of living within its boundaries. It is both a material and onto-epistemological process of reconceiving and enacting the awareness that all life is fundamentally interdependent (Williams, 2012). According to Armstrong, the collective continuance of life will depend on our ability to restore deeply broken kinship relationships which are embedded in the psychic and institutional fabric of societies worldwide and regain the *"lost the capacity to experience the deep generational bond to other humans and their surroundings''* (Armstrong, 2006:467). Armstrong proposes the concept of *'active indigeneity'* to revitalise a *"society wide knowledge of the requirements of the places we live in and learning to live within its reciprocity"* (Armstrong, 2015). Williams also describes it as *'deepening into place'* or *'becoming of place'* through everyday practices which respect the reciprocity of place (2018:347). This resonates with decolonial perspectives that transformation is required at all levels of existence - the physical daily routines, social institutions, rules frameworks and policies, technical practices, economic organisation, socio-emotional aspects, down to our very perception of reality, our worldview and assumptions about life (Williams, 2012). The 'rewilding' of knowledge in university, through including affective, embodied and spiritual ways of knowing is fundamental to *"reclaiming interconnected subjectivities, i.e. that we are not individualistic social beings, but spiritual beings that are interconnected with others, including non-human beings''* (Shahjahan & Haverkos, 2011:16). This does not mean that there is no place for positivist science,

which also has brought many possibilities for human and non-human wellbeing. It does however change certain scientific approaches into techniques that are suitable for specific purposes rather than exclusive validation methods of truth. Science education is then a reflective practice within a diversity of epistemologies and ontologies, and about learning which methods to use in which circumstance. Indigenous cultures also use a diversity of methods to explore their world, including experiments (Berkes, 2008).

Ancestral wisdom and indigenous cultures

"Ecological awareness will only arise when we combine our rational knowledge with an intuition for the nonlinear nature of our environment. Such intuitive wisdom is characteristic of traditional, nonliterate cultures, especially the American Indian cultures, in which life was organised around a highly refined awareness of the environment" (Capra, quoted in Berkes: 2008 1).

Indigenous cultures can offer powerful resistance towards domination structures and important guidance in learning towards partnership. Their presence works as a reminder of other possibilities, a living voice that can help to 'remember to remember'. Many of them show proof of sophisticated and deeply embodied partnership cultures. As a cultural example, Native American (NA) traditions provide an example where many aspects of sustainable living were integrated into a living whole. The cultural encounter with such a culture may work as a powerful disrupter and inspirer for transformation (Wals, 2019). It is mostly through felt experiences that our assumptions become visible and disrupted (Zylstra, 2014). Cultural adoption of spiritual epistemologies and relational practices in Western higher education is therefore not intended as cultural appropriation or another form of colonisation. I would rather define it as a process of re-membering. Western culture has known partnership culture and nurtured aspects of it into the present time. Western society has grown strongly towards domination and needs cultural examples to re-member partnership; literally remembering cultural forms our ancestors have lived but also re-membering in the sense of becoming a member of the reciprocity of social, ecological and spiritual relations which enable life to unfold (Starhawk, 1994).

In this research I play with the term ancestral wisdom as a way of finding common ground between the otherwise rigid divide between Eurocentric culture and indigenous cultures. I take the perspective that Western culture is a mix between Europe's earlier partnership cultures and the later colonial culture of domination. European 'indigenous' cultural aspects can be re-membered in present day ways of being and doing, as ancestral knowledge that can be revived. Ancestral wisdom then refers to a body of knowing that is accumulated over time in a way that is not random but functional to living, time-tested and wise. It resonates with the term traditional ecological knowledge - knowledge, which in a dictionary sense refers to '*cultural continuity transmitted in the form of social attitudes, beliefs, principles and conventions of behaviour and practice derived from historical experience*" (Berkes, 2008:3). However, I would suggest that it contains a spiritual and intuitive ground, which can be remembered even if cultural continuity has been disrupted, as I have experienced this myself through a deep change process I underwent in the last 10 years of my life, and have seen it in others. This aligns with some indigenous interpretations of knowledge as ever present in a collective unconscious (Peat, 2005). In the Western context the continuity of transmission has been disrupted but it has apparently also continued otherwise today we would not

experience resurgences towards partnership cultures. This shows ancestral wisdom is both cumulative and open to change, transforming itself in new contexts but depending on intelligent reflection and time-tested practice. An Inuit definition of traditional knowledge was expressed as *"practical common sense; teachings and experience passed through generations; knowing the country; being rooted in spiritual health; a way of life; an authority system of rules for resource use; respect; obligation to share; wisdom in using knowledge; using heart and head together* (Emery, 1997:3). It contains the body of accumulated experience of being alive as a human on this earth and how to go about that. The term wisdom thereby expresses a sense of balance in the midst of complex and sometimes contradicting options. It also expresses a more than practical knowhow, including spirituality and other inner ways of guiding our lives.

Today's indigenous peoples may be viewed as important carriers of ancestral wisdom, as their cultural expressions build on thousands of years of direct human experience living in close relationship to the earth's ecosystems. According to the World Commission on Environment and Development, *"these communities are the repositories of vast accumulations of traditional knowledge and experience that link humanity with its ancient origins"* (WCED quoted in Berkes, 2008: 3). North American indigenous peoples or cultures have developed a vast cultural diversity. There are, however, important commonalities between these indigenous cultures which offers us a basis for cultural reflection. Berkes calls it *"the paradoxical nature of Indigenous knowledge: it is intensely local, but at the same time, it is universal"* (2008: xxi). Some of these commonalities are the embeddedness of knowledge in local cultural milieu, the importance of community, lack of separation between nature and culture, subject and objects, attachment to the local environment as irreplaceable place and a non-instrumental approach to nature (Banuri & Marglin, 1993). In researching how NA indigenous cultures can inspire partnership in Western higher education, I will look into how these cultural aspects are being practised in ways of living, knowing and learning. These insights will then be translated into a pedagogical approach applied in an existing university course.

Intermezzo - A personal story of change

I feel the need to tell some personal stories of change. This research has really come out of these changes, and they have influenced my framework and way of thinking fundamentally. In a way, this is my positionality. I hope it also inspires others to read it. It feels vulnerable to share. But I do it nonetheless. To some it may come across like I'm just nuts. Who Knows?

After I graduated cum laude from my BSc in 2010, I remember leaving the gates of the campus of a renowned international college and feeling like I really didn't know the world at all. I was estranged from the people having jobs, seeming to be more related to the world. I had no relationship whatsoever with the non-human environment at that point, although I had it when I was a child. The many years indoors behind the computer had made me forget. I also sensed a loss of self, a connection to my feelings, identity and wishes. Like so many others I had no clue what I wanted or what I was good at except for writing papers. I went travelling far away. It helped to regain a sense of connection with all the people I met and the beautiful nature I enjoyed. A sense of spirituality grew into me in the unplanned process of travelling and hitchhiking around, where I became aware

of the mystery of synchronicity. Things happened in an unlikely, often magical coincidence. But returning back home it was hard again. Working life appeared to be more numbing than expected and so I returned to the university. This time to learn about ecology.

However, the magic I discovered during travelling did not fully disappear in the semi-structured student life. Some peculiar people and experiences crossed my path which lured me into questioning the mechanistic worldview I had grown up with. I had always been a rather rational person but this was now changing. In a short period of time in which I had moved house to a beautiful natural place and was spending my full summer holiday exploring the natural surroundings, I quite suddenly entered into a new way of being/perceiving/knowing the world to a state that was more enlivened. At that time I had no idea what had happened, nor did I think much about it, I was just living it. Intuitively I knew it was right, I remember I had followed an inner compass, a sense of direction in my own world of perceptions. And I kept having experiences that lured me further. During this process, the world became enchanted to me, much like is described in various accounts of indigenous traditions or spiritual experiences of all kinds of people. I could walk in the forest with my eyes closed and know where the trees were by sensing. I felt a vibrant connection to other living beings. I didn't think much - in a rational way - I was in an intuitive, sensing state most of the time. I found some larger trees in walking distance from my house that I like to visit. One in particular gave me a sense of belonging and feeling home. It was a big chestnut with one low branch growing almost horizontal making a perfect seat. Although a busy path from the student housing project was only 5 m away, I discovered that people would rarely see me as long as I sat still, even during daytime. I like to visit the tree most in the evening, hiding a bit in the lower branching with a view over a beautiful pond and flower patches. Another place I kept visiting was a large meadow with beautiful, purple-coloured grasses. It was new to me to feel so welcomed as I did there. It felt as if the grasses knew me, waved at me. As I entered this meadow, I always felt uplifted a little and lovingly nested in the tall stands of grass.

After that summer holiday, I had paused my studies because I had health issues to deal with. In the years that followed, I was still not able to enrol in university, which in the end has been a gift to me. It offered me the space to explore another way of being in the world, but just right here, in my life, in my house and garden, not in some exotic place. I had much time to spend and continued my explorations in nature. I visited the chestnut tree almost every day and just sat on her branch, feeling home. I observed the pond, the people passing. And my inner world. The intensity of perception I had felt in that summer period faded but the sensitivity stayed and I got used to it. As I did not have to follow anybody's instructions, nor my own expectations I found space to follow more natural, bodily rhythms during the day. Basic things like food, physical wellbeing and company became more central in my life. I collected most of my vegetables from a nearby self-harvest farm, which connected me to food and health like I had not grown up with. I could taste the health of those plants and feel its effect on my body. This was even more so for the wild plants I gradually included in my diet. Something I had started learning during a work-away on an organic farm. Somebody there showed me how many of the weeds we so desperately combat are edible, tasty and healthy. With this new activity I also developed a new sense of belonging to the wider landscape of Wageningen. In search for edible leaves, seeds, roots and nuts or flowers for tea I got a pretty good overview of the ecological distribution of dozens of species growing around, including their life stages throughout the year. I started to live in my landscape and body as if I was part of it. I related

to life and wellbeing in a new way. Never before had I thanked the landscape, but now I did it all the time. It felt natural to thank the plants after taking a valuable harvest. And to care that I didn't take too much. Spending time roaming around for food, I couldn't help but notice the other living creatures, birds and insects or animal tracks. They became part of my mind, my world also when I went back home. My personal life felt less separated from all the others in the same landscape.

As I got better over the years and took up studying again, I re-entered the world from a totally different place. It became clear to me how science education had forced a view onto me and many others. I noticed I made nearly all my decisions intuitively and I have my own experiences now to reflect when considering questions of worldview or truth. I noticed that in discussions with other people about topics of health, sustainability or spirituality, I had something to build on other than science. In the beginning it was hard to stay close to my own experiences, but it never faded. I also decided to use the university for my personal goals instead of measuring up to the expectations from the curriculum. I decided not to follow anymore, but to use my education for my own purposes. I came to understand critical perspectives on science, patriarchy and Western domination and wanted to know more. I felt the importance of my experience for sustainability. That without a nurtured level of sensitivity we are too easily drawn into destructive practices for the short-term material gain. How can we re-member a way of living that is sensitive? My purpose became to understand this more fully and bring this awareness everywhere I was working. I took my time, followed what I wanted to do and used the safety of being a student to find my place in terms of career. I included my new state of awareness in everything I did, and this turned out really fruitful. I created several trainings for students with a student foundation called OtherWise, following my compass and inner sense of knowing. I had no idea actually what I was doing, and yet I did. I experience the power of re-membering. All of these still exist today as appreciated initiatives. I also started working for a company that organises camps in primitive living skills. Much of what I had experienced came together in the practices and stories there, which were embedded in a variety of indigenous traditions from around the world. It deepened the understanding of my personal experiences and gave them a wider context. I also got involved with the practice of food forests, a form of agroforestry that has been practised worldwide by indigenous peoples.

In all these years, many spiritual experiences crossed my path. Spending time in the forest with the primitive skills camps, I experienced the abilities to communicate with nature and pick up subtle information about the environment. I experienced what happens after spending longer times in one place, attuning to the rhythms and sounds. I noticed how the body/mind changes, integrates. I did rituals, such as a sweat lodge, which can be considered cultural appropriation, but has its effects nonetheless. It was powerful for me, I experienced how the stones in the middle of the hut communicated with me and they took me to another world. I experienced an abstract way of being, playful, like a little spark of energy, moving around. I had no language and couldn't sing like the others in the hut. I came out a different person. I knew something that nobody could take away. I have experienced many other remarkable things in the forest and in community, sometimes through rituals, sometimes just like that. It seems rather normal to me now that these things happen when you are out in nature. Over the years, I also built a very special relationship with the house cat. We often went for walks together and generally spent much time together in the years that I had been home a lot. I learned wordless communication from her. One day came the situation that I was going to move out. She had lived in the student house where I moved from for all her life. She was not my

cat then officially. I did not know what to do and talked to people about it. One woman suggested that I ask the animal communicator. It was her job to speak with animals. I had heard of such things but still found it quite remarkable that this could really work at the level of detail that was proposed. I invited her to talk with Taxi the cat. It was remarkable. She wanted to move out with me and needed me to confirm to her that she was my cat. That we were together. After this talk, our relationship fundamentally changed. Taxi and I had clicked at a deeper level, which was noticeable in her behaviour. We moved out together, and really became inseparable. Not many people understand the kind of relationship that is possible with animals. I took a training with the animal communicator to learn it myself, and now regularly participate in her practice groups. We talk with animals, plants and whatever other beings that people bring in. It was weird in the beginning, but if you do it, it just works. We usually discuss health issues or relationship issues of pets and their owners, but sometimes we bring in a plant or another being to ask questions to. You just get images in your head or sensations or sentences. It's fuzzy, but after a while it becomes more clear what to look for inside your own awareness. Now when I leave the house for a weekend, I 'call home' to Taxi to check how she is doing. It's very useful. And know better what to do when there is a problem. Eventually Taxi led me to a powerful experience of Oneness. It was in fact last year, right after the ecological design and permaculture course. She got very sick and was dying. The cause was unclear, something with the liver, she wouldn't eat anymore and she was feverish. I was deeply saddened by her sudden sickness and stayed at the house to watch over her. It turned my world upside down since she had become my main point of safety in life. A few days into the process, I had a vision. I saw how both of our lives were intertwined, like mirrors, each resolving an opposite part of karma. It came together somewhere in a light where it dissolved, where something was set free. It sounds very vague of course, I cannot be described. It is a level of understanding that works differently. I understood it. Then one night, she came to sit on my bed and I felt how she took me by the hand, spiritually. She guided me and I understood somehow where we were going. I felt like we travelled down through rings and then I fell through something, and I felt bliss. Just total bliss. I woke up, and I was still in bliss. I looked out at the trees by the house, and they had a kind of vibrance around them. So did the birds. It felt imbued with the softest kind of energy. It was so gentle. Dying really wouldn't matter. A few days later Taxi just started eating again and she recovered. The vet thought it was not possible. She is fine today still.

These experiences are hard to stay connected to when you sit behind the computer and just live life. But they have a foundational effect. I have become much more compassionate over the years, and just Know things. Nobody can tell me these experiences are not real. It makes everything that happens in the world different. And it helps me fundamentally in all choices. It has deepened my respect for life and makes everything I do to help life so enjoyable. Funnily, it took me 10 years to integrate my sensed reality with my cognitive understanding of reality. It seemed impossible, magical, dreamlike and scary that such things could be true. But more experiences kept coming that proved again and again there was something. I met more people who had similar experiences. Slowly a very relational worldview developed that I dared to believe in also cognitively. But I've always wanted to keep it open for change, because this is what brought me to this experience in the first place. I just follow my intuition, and make sense in the process.

This research is part of that purpose. My research needed to have personal meaning to me, for in the end millions of papers are produced worldwide that nobody ever reads. I was not going to pour

my valuable energy into a work that would disappear into anonymity. This in itself is an act of resistance to being 'consumed' by the system. I chose to explore ancestral wisdom because I wanted to learn more about it myself, but also because it is relatively under-appreciated considering that we do not have many other examples that could guide our process towards a liveable future. I also decided that it should contribute in an active way to the exploration and manifestation of a more regenerative culture. Therefore I decided to take an action research approach and apply my learnings in an educational setting which I happened to be involved in.

What I feel and some others too, is that a whole different order, a new ontology is already pushing up through the cracks, moving through it into our consciousness, who knows from where. It feels like the age-old serpent, the eternal life force, whom everybody thought a forgotten myth from the far past, silently woke up again and shedding her skin now wiggles through us and everything shaping a new order, leaving everybody confused. I feel her inside me actually, a powerful force that has slowly taken over as I abandoned control step by step, forced by life's experiences. I feel like I wiggle with her, not exactly knowing where to but just following intuition finding my way. I feel guided. How can I help this life force wiggle into higher education? This is what I want to explore in this thesis. I want to explore how this can be done, within my own context and radius of action.

3. Positionality & Methods

3.1 Positionality statement

This research is as much a transformative process for myself as an attempt to transform a little part of higher education in my circle of influence. As described in the introduction and theoretical framework, my view on knowledge cannot be described well in terms of subjectivity and objectivity. As a member of life I am concerned with its course. This drives me to do this work. My approach and view are very subjective and activist in the sense that it aims to achieve change, based on a worldview that I have proposed in the theoretical introduction, supported by other voices. I fully acknowledge how my positionality has shaped the subject under investigation, the research context and process (Holmes, 2020). I perceive my subject as a source of knowledge - because I believe through subjectivity our perception and consciousness are produced in time/place reality. I believe there is perception and consciousness 'outside' a time/place reality, which can be experienced in what we call spiritual states of awareness. But I do not think one or the other is more true. I believe in non-material existence and consciousness, but while being in the process of materiality I believe we largely depend on our body to make sense of things. The assumptions we make, even the things we can see and feel, depend on our consciousness and vice-versa, there is no separate place (Capra, 2002). However, I have experienced spiritual ways of knowing in my daily life, and much of my perspective above has been fed from these experiences in combination with reflective practice. I do not however reject the aim to be 'objective' as a valuable attempt to question our own perceptions and sharpen our observations. I understand it as a form of caution in the process of making sense. This carefulness is necessary both when we apply rational and intuitive inquiry. Both are just

different types of strategies to produce knowledge. It is our task as humans always, in whatever way we make sense, to carefully way up the different perspectives. This research is a reflection on value systems and cultural adaptation to life. They require people's wisdom and careful consideration, and 'knowledge' which comes from personal experience in life. I have tried to integrate my personal experience with careful consideration of literature. This has been a reflective process in which questions keep coming. At some point we need to take a perspective, which is not absolute or finite but a valuable proposition for the moment.

3.2 Methods

This research contains a theoretical exploration and an action-oriented part. The process of doing this research will contribute to a living knowledge; an experience for everyone involved that may lead to transformative reflection and follow up actions. There is plenty of theoretical material on transformative learning, it seems hard to put into practice. As a Western student I am limited in my understanding of ancestral knowledge and transformative learning practices. Yet, due to my personal transformation processes towards relationality and my involvement in teaching, I am also not completely oblivious. I take my own learning process as an inspiration for anyone who is interested. This research also contains an action component; by experimenting with transformation in class I create the opportunity for students, teachers and also affiliated staff to reflect on education. The research thereby contributes to a transformation process. Transformative aspect of the research is enhanced by sharing the process and results beyond the direct teaching staff.

Part 1. Literature review

In the first part I explore insights from ancestral cultures mostly based on literature. The objective is to grasp important wisdom and practices that resonate with the view on transformation outlined in the introduction and theoretical framework. The learnings we could receive from indigenous ancestral cultures are endless and this study is limited. For the gathering of literature I have used a combination of *snowballing* and *synchronicity.* Snowballing is an iterative process of using citations from useful literature as a steppingstone to further potential sources. Synchronicity is explained by Zylstra as a process of *"giving due consideration to literature which was coincidentally encountered (through e.g. peer recommendation or serendipitous encounter) at the 'right time' and found intuitive and meaningful resonance with salient questions for the researcher such that it unlocked key understandings needed at the stage in the review process."* (2014:40). This process has helped to find meaningful sources and set boundaries to the vast body of works available about North American indigenous cultures. The two approaches have resulted in a combination of scholarly work and informally published key works from native and non-native scholars writing about ancestral ways of living. The focus on North American cultures is on the one hand a weakness, as these voices do not represent the full scope of cultural variation. However, it is also a strength in the sense that these voices can be placed with a certain cultural/geographical influence. However, many writings take an intercultural approach and attempt to describe key aspects of ancestral knowledge that are recurrent in many traditions. For the purpose of this research this appeared purposeful and sufficient. I have experienced the writing process as emergent and intuitive. When I started, I was

not sure what I was looking for. In the search and reading process, it occurred to me that works described ways in which NA indigenous cultures maintain relationships in spiritual, social and ecological space, which are not separate but embedded into one another. Similarly, the concepts of living and knowing are clearly separate from one another. But these concepts have worked as focal points for the analysis. The main aim of this literature review was to filter important insights to translate into curricular elements and design options. I have tried to limit the description to core understandings but also contextualise enough to get a felt sense of indigenous ways of living, knowing and learning in spiritual, ecological and social space. This has been an intuitive process that was practically limited by time.

Part 2. Educational design research

In the second part of this study I take an educational design research approach. The purpose of this approach is to elicit and evaluate design aspects that are relevant and applicable for the transformative learning approach I aim to introduce in the context of higher education. EDR is a useful strategy in a situation where there is little knowledge and experience (McKenney and Reeves, 2012), which is the case for introducing indigenous onto-epistemological praxis in Western-based science institutions. EDR allows for an interaction between theory-driven and practice-driven knowledge - as the initial design is informed by 'theory' (or rather what has been learned from previous thought and experience) while the research output arises from the direct lived experience of the design in practice (Lakkala et al. 2012). The research output of this study is threefold:

1) a narrative of the design process
2) an evaluation of the learning experience by students and staff
3) a formulation of design principles and areas of attention that can be used to guide similar endeavours

EDR is characterised by a commitment to *"production of innovative learning environments, knowledge about how such environments work in the settings for which they are designed, and, hopefully, some more fundamental knowledge about learning or teaching"* (Sandoval, 2014). Within the tradition of EDR there is no particular systematic approach in the procedure of the research; something that EDR has been criticised for. In this research I will follow Sandoval (2014) who proposes an approach called conjecture mapping, which is a way of specifying salient features of a learning environment design, and mapping out how they are expected to work together to produce desired outcomes. Conjecture mapping can be used in a very detailed way to make empirical predictions that can be tested, and make refinements of particular design principles as well as theoretical perspectives. In this research, the context is more exploratory. Academic research on the expression of indigenous ways of knowing, learning and being in Western higher education has not yet reached the level of refinement. More importantly, I am hesitant about the idea that there exists a conclusive way of designing such learning environments, because of the multitude of design possibilities within the equally large number of different contexts where it can be designed into. Indigenous ways of knowing, learning and being cannot be conclusively defined, and find different forms of expression. Also the outcome of particular designs will be different for various audiences. The focus for me is to inspire the practice of transformative learning by building a compass that invokes an inner recognition of 'sustainability' and gives practical inspiration for design.

This procedure follows several steps as outlined in the figure below. This model is adopted from (Cremers et al., 2016).
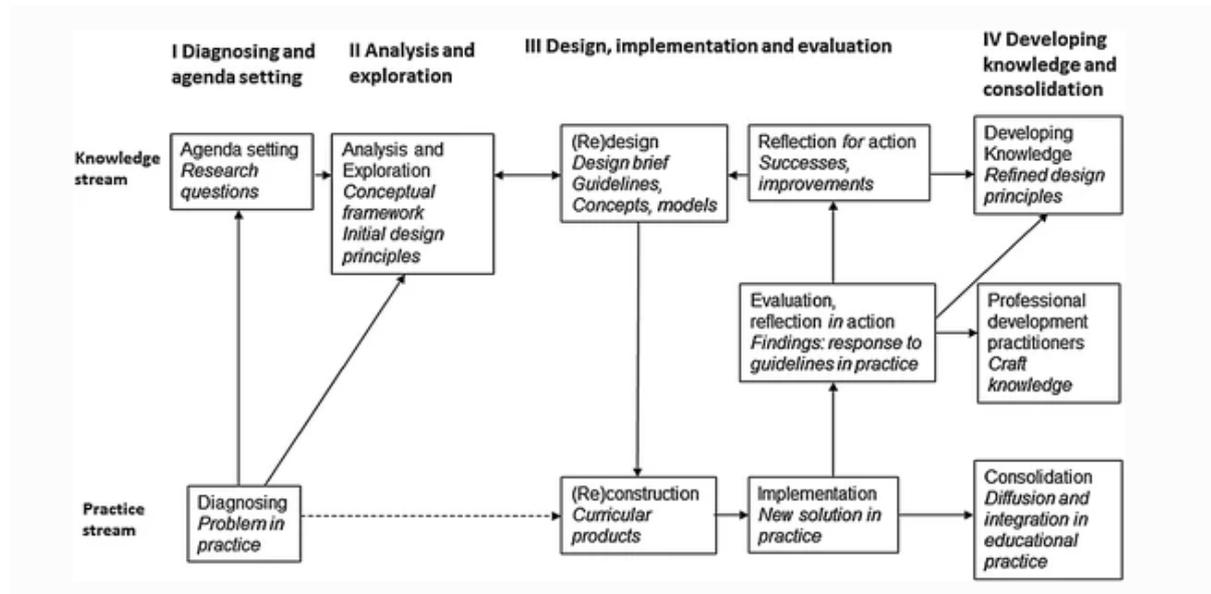
1. *Diagnosing and agenda setting*. A problem diagnosis and agenda setting are found in the introduction and theoretical framework of this thesis.

2. *Analysis and exploration*. A conjecture map is created of insights and inspirations collected from literature on indigenous ways of living, knowing and learning. These are to be translated into design elements. These conjectures are mostly based on literature and my personal experience (craft knowledge) with the encounter of indigenous learning in various contexts. The process of mapping and translating this into design elements is described in a narrative of the design process.

3. *Design*, *implementation and evaluation*. The elements are implemented in the course Ecological Design and Permaculture, which took place in May 2021. Other staff members are invited to reflect together on these manifestations. At the end of the course, students were invited to reflect on how they experienced the learning configurations through a reflective questionnaire. The reflections of staff and students inform the formulation of tentative design principles.

4.*Developing knowledge*. The main research question is answered in various ways. Firstly, through a narrative of the design process which eludes the pathway from conjectures to learning configurations, we come to understand how to translate indigenous ways of knowing, learning and being in the context of higher education. Through the reflections of staff and students we come to understand the connection between the learning configurations and the learning experiences. Conclusions can be drawn about enactment of the design principles to the desired learning processes. The experiences and insights from this research will also be shared with the chair group to which the course belongs, as well as the transformative learning hub group which is active at my university.

3.3 Ethical considerations

Some injustice is unavoidable in this undertaking to learn from indigenous cultures for transformative learning. Although the goal of this research is to pay respect to indigenous cultures and learn from their wisdom, I have no other way than to study and describe this wisdom in a colonising language. In this research I have tried to stay close to indigenous views by quoting mostly from indigenous sources or sources which have been acknowledged by indigenous peoples of NA. However, the written accounts of indigenous knowledge, any indigenous knowledge, will necessarily be incomplete. I have tried to deal with indigenous knowledge as lived knowledge instead of 'myth or data' (Holmes 1996: 380).

I have also tried to overcome the position of outsider by exploring my personal experience of transformation towards a relational worldview and relating this to concepts described in literature. Through this lens I have tried to find a base of commonality. I have experienced this thesis as part of a larger process of re-membereing indigeneity and decolonisation of my body-mind-soul that I am undergoing. Therefore I have not undertaken this research from a distant position of scientific analysis. However, I remain an outsider and cannot do justice to the full cultural integrity of NA indigenous cultures in this research. It would have been a tremendous addition to include indigenous peoples as reviewers of this study. This was not an option due to the lack of such contacts but also due the time constraints of the work.

In relationship to the students, some ethical considerations include the proper introduction of the course procedures and handling of data. We have informed the students at the start of the course about my research and asked explicit permission to use their reflections as data. The data has been treated anonymously.

4. Ancestral Wisdom explored

4.1 North American indigenous ways of living, knowing and learning

"Throughout history human societies have attempted to guide, facilitate, and even coerce the instinct for learning toward socially defined ends. The complex of activities for forming human learning is what we call "education". To this end, human societies have evolved a multitude of educational forms to maintain their survival and to use as vehicles for expressing their unique cultural mythos. Cultural mythos also forms the foundation for each culture's guiding vision, that is, a culture's story of itself and its perceived relationship to the world. In its guiding vision, a culture isolates a set of ideals that guide and form the learning processes inherent in its educational systems. In turn, these ideals reflect what that culture values as the most important qualities, behaviours, and value structures to instil in its members. Generally, this set of values is predicated on those things it considers central to its survival" (Cajete, 1997:25).

The study of traditional ecological knowledge (TEK) systems is key to present day understandings of indigenous ways of living, knowing and learning. Berkes has defined traditional ecological knowledge as *'a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment'* (2008:7). Peoples' relationships to the land and their survival within the context of specific places has shaped indigenous ways of living, being and learning over the millennia. This has resulted in unique adaptations with a wide diversity of cultural expressions. However, among this diversity we may find recurrent patterns. Traditional knowledge systems are generally characterised as a complex of knowledge-practice-belief interactions. Traditional knowledge is a 'lived knowledge ', embedded in practice and shared metaphors (Ingold, 2000). Practices of living the land are embedded in social and spiritual processes and vice versa. Traditional knowledge is thus a story of how human social/cultural systems adapt to specific ecosystems, but also a more universal story of how humans adapt to the consciousness of being alive. Spirituality is related to both. Traditional knowledge is both a way of knowing, dynamic and continuous, building on previous experiences and adapting to changes, and it is also an accumulated body of knowledge, the thing known (Berkes, 2008).

Traditional ways of living, knowing and learning are bound to material, social and spiritual aspects of living. In the following chapter I will discuss NA indigenous ways of living, knowing and learning as they relate to these levels. In reality, they are not separate layers but for practical purposes I take this approach following Berkes (2008:17).
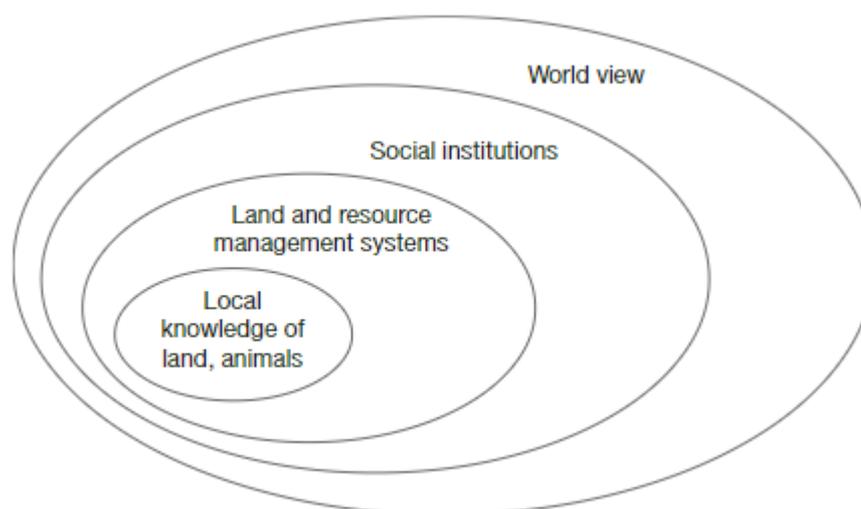
Figure 1.1 Levels of analysis in traditional knowledge and mangement systems.

Living and knowing Nature: a worldview

NA indigenous ways of living, knowing and learning revolve around the principle of relatedness and express a continuous balancing of individual and community development. The basis for all relations among NA indigenous ways of living is a spiritual worldview of unity. The Lakota expression *Mitakuye Oyasin* - 'we are all related' - represents the foundation of most NA cultural orientations

and the importance of balancing and caring for the vastness of relationships that make life possible (Cajete, 1997). In this worldview, everything is considered animate (alive), everything has spirit and knowledge. Therefore all are relations of the human species. "*Mitakuye Oyasin acknowledges that within each person exists the entire universe: all who have ever lived, all who are living now, and who are yet to be born, as well as nature - Our Mother Earth, the sun, the moon, plants and all the stars - all of the Sacred Universe since the beginning until the end of time… we are all cosmic beings. We come from the stars*'' (Cajete, 2000:146). Native American cosmologies emphasise the dynamic, holistic nature of creativity as a working force in the universe in their mythological creation stories (Cajete, 1997). Native creation myths embody metaphors of chaos, creative participation and bring a deep intuitive understanding of the creative processes inherent in life. One of such stories tells about Sky woman. As the first human she falls from the sky into the ocean of the earth, which at that point does not have land. The animals of the sea gather around her in concern, she cannot live in the waters. One by one they go down to the bottom of the sea to find mud, eventually the muskrat manages to bring some up. Sky woman is delighted with gratefulness and spreads the mud on the back of a sea turtle, and she dances and dances her gratitude on his back, which makes the turtle grow and grow until it forms a land mass. Sky woman can live there and the seeds that she brought from the tree of life in the sky, she spreads over the land (Kimmerer, 2013). Such creation stories are common among indigenous groups and embody the understanding that humans co-create the world together with other beings. Therefore humans have responsibilities to their co-creators and vice versa (Cajete, 2000). Native creation stories recount deep spiritual relationships in the long journey that humans have made with other species and beings, whereby humans are seen as a form of nature that has developed its own unique capacities. The most important one of these for the natives is story making and perception, which form the basis of science, cultural expression and adaptation. The ability to understand patterns and perceive them in our imagination allows for unique ways of interacting with the world. Together with the skill of making tools, humans have gained a unique power that also comes with a unique responsibility. Origin stories recount the human journey of learning to live with these capacities in the mysterious web relationships. According to Cajete, both native and modern science have elements of the primal human story in common. They differ, however, in their fundamental orientations towards the natural world and role of humankind in coming to know its place and responsibility within the creative unfolding of the mystery of life (2000). Nature is not seen as a collection of objects but rather *"a dynamic, ever flowing river of creation inseparable from our own perceptions"* (Cajete, 2000:15).

Cajete has coined the term native science to emphasise that indigenous ways of living and knowing are a science, a way of understanding the patterns of life (2000). Native science is a story that reflects the unfolding of a creative universe in which beings are active, creative participants comparable to the view of dependent co-arising that emerged in Buddhism (Macy, 2007). In this view, science itself is evolutionary, it unfolds along the general scheme of first insight, immersion, creation and reflection. Truth is not a fixed point, but rather an ever-evolving point of balance, perpetually created and perpetually new. Native science can be understood as a system of pathways for reaching this perpetually moving truth or 'spirit' (Cajete, 2000). Creativity as a force is central to native thought and experience. The search of how to relate to this force is an existential drive, expressed by Cajete as 'seeking life'. Both Western and NA indigenous cultures seek life, but from a totally different place. For the indigenous peoples, *"the ultimate aim is not explaining an objectified universe, but rather learning about and understanding responsibilities and relationships and*

celebrating those that humans establish with the world" (Cajete, 2000:79). For North American natives, there were no separate words for science or philosophy (Cajete, 2000). The noun knowledge does not translate easily into most indigenous languages, in part because most of them have verb-rich instead of noun-rich linguistic systems, but also because knowledge or knowing is not perceived as something separate from living. The corresponding translation of knowledge into indigenous languages often results in expressions like 'ways of living' or 'ways of being' in nature (Aikenhead & Michell, 2011). Similarly, nature is not seen as an identifiable object separate from human life, but rather as a process of which humans are part also; *"nature is the creative centre from which we and everything else have come and to which we always return* (Cajete, 2006:250).

This process-oriented view on life is important for many indigenous cultures. The process of *seeking life* was experienced as an all-encompassing task in all daily activities. Cajete coined the term native science as a metaphor for a wide range of tribal processes of perceiving, thinking, acting and 'coming to know' life through direct human experience with the living environment, what could also be called indigenous of ancestral knowledge (2000). Native science is nurtured by participating in the landscape through lived and storied ways. It is based on the perception gained by using the full body of our senses. In this process, both sensations, imaginations, emotions, symbolism as well as concept, logic and rational empiricism play a role. This also means that native science cannot really be understood without experiencing, as words often destroy or distort the real and holistic understanding. Native science encompasses life's activities of art and architecture, practical technologies and agriculture, hunting and animal husbandry, plant domestication and medicine, metallurgy and geology, metaphysics and philosophy, ritual and ceremony, which are all ways of 'coming to know' life. Native science is the collective heritage of human experience with the natural world, like a map of reality drawn from the experience of thousands of years of human generations. Cajete views native science as inclusive of modern science and as the advent of modern technologies. From the perspective that science is "*a way of understanding the world, a story of how things happen, a way that human beings have evolved to try and explain and understand existence in time and space and relationships vis-a-vis the natural processes of the world"*, every culture has science (Cajete, 2000: 3).

Indigenous peoples' cultural ways of life are also physically and socially relational - they are tied to the relationships that are established and applied over generations of living in particular places and the earth as a whole. Participation is the ground for knowing. Ancestral knowledge is *lived knowledge* that is generated through practice by everyone in the community (Ingold, 2000). Key to indigenous living, knowing and learning systems is an extensive oral history that has been accumulated and handed down over generations. It contains the experiences and reflections of a whole People over thousands of years of living. As a living database it works as an anchor against which present events can be measured and understood. In NA indigenous cultures, science is inclusive of spirituality and vice versa, not like religion in the Western sense. According to Cajete, spirituality is a belief in the sanctity of personal and community relationships to the natural world, which are creatively acted upon and expressed at both the personal and community level (2000:14). It is mutual reciprocity, the give-and-take relationship with other beings, that presupposes responsibility to care for, sustain and respect the rights of other living things, plants, animals and the places we live in. If you depend on a place, you take care of it or suffer consequences, a lesson learned by many generations. Some indigenous writers explicitly state that indigenous spirituality is not religion, as for them spirituality is nature based, Creator's creation, while religion is considered a

human-based invention (McGaa, 2013). McGaa tells that traditional people did not invent their morals and ethics, but that animals and plants taught them how to live appropriately. In this view, indigenous spirituality is the intricate observation of reality in both its visible and invisible (but sensible) expressions. This entails a moral practice of becoming aware of the susceptibility to deceptions, fears and superstitions, greed or ignorance. *"The Natural Way of spirituality is a matter of living your beliefs according to what you know, understand and feel in the presence of that which is Nature. It is a lifetime of moral and ethical application of integrity and caring for others. It is not about personal salvation but about the continuation of place and community*"(McGaa, 2013: 245). The social, ecological and spiritual aspects are intertwined in the ways of living, knowing and learning.

Living and knowing the physical reality of Nature

Among the NA indigenous cultures, there have been a variety of adaptations to the physical environment. Most survived through a combination of hunting, gathering and agricultural practices. This included the use of fire to direct successional processes but also the domestication of the plants and animals (Berkes, 2008). Traditional cultures have relied on careful observation of the natural environment to adapt their ways of living accordingly. This process produced local knowledges specific to place, transferred over generations through story, apprenticeship and participation in livelihood activities. These knowledges typically hold long term views and contextual understandings of the environment (Berkes, 2008). Traditional peoples have had to understand a vast diversity of ecological processes in terms of weather systems, animal migrations and seasonal behaviours, plant communities and succession to name a few. Most domesticated species have been developed by traditional cultures. Berkes employs the concepts of *adaptive management* and *social learning* to describe the ways in which traditional peoples have dealt with the limits of their places (ibid). Adaptive management "*takes a dynamic view of ecosystems, emphasises processes (including resource use) that are part of ecological cycles of renewal, and stresses the importance of resilience, that is, the buffering ability of the system to absorb change without breaking down and going into another state of equilibrium*" (2008:72). It is based on the assumption that nature cannot be controlled and yields predicted and that uncertainty and unpredictability are characteristics of all ecosystems, including managed ones. Feedback learning at the individual, social and institutional levels are a main adaptation for traditional societies to deal with uncertainty (Berkes & Folke, 2002; Ostrom, 1990).

It is beyond the scope of this research to elaborate in detail about traditional resource management systems, however I will describe important features so as to understand related learning processes in the following section. Studies of NA indigenous ecological knowledge show that indigenous peoples have in-depth knowledge of their land and local species (Berkes, 2008). Intuitive understanding of plant requirements and plant communities as well as sophisticated imitation of successional development in forests are common characteristics of traditional ways of living. Soil-relief-vegetation relationships are well understood, and key-plant species have been used as ecological indicators of productive practices and soil fertility (Barrera-Bassols and Toledo, 2005). A recent study showed that forest gardens which have been managed by indigenous communities till 150 years ago still show a substantially greater plant and functional trait diversity than periphery forests in the Pacific Northwest (Armstrong et al, 2021). Systems were adapted to population density, condensing extensive systems with low management and lower productivity to home

gardens with high management and high productivity with increased population size (Berkes, 2008). Fire has been used extensively in the management of productive ecosystems. Some studies suggest that most of the East coast forests of NA have been managed through fire to increase nut and berry production or for rangeland or grazing habitat management (Jacke & Toensmeier, 2005). Fire has also been used to prepare garden patches and agroforestry systems. Intercropping and adapting crops to succeeding stages of succession were common practices. These examples show that it is possible to sustain a productive multi-functional landscape and a high degree of biodiversity by maintaining a variety of uses.

Living and knowing the social reality of Nature

NA indigenous cultures developed a complex and sophisticated body of social institutions that guided interactions both within the human community and within the larger community of life as experienced in cosmologies of relationality. Survival of the group was directly dependent on balanced resource use and community functioning. Steward (1936) theorised that social organisation among human groups is a result of adaptive processes by which humans utilise a given environment. Even though traditional systems are locally determined, there are comparable ecological adaptations in comparable areas (Lee and Devore 1968). Many indigenous languages do not have words for resource or management, which indicates a different experience of the land (Berkes, 2008). Both the physical and spiritual dimensions (as we would call it) structured the interactions with the environment. Both played an important role in social organisation, and learning processes (Cajete, 2000). Among NA indigenous culture, community-based territories were probably the primary practice of resource management. Most had systems of land tenure that involved rules for resource allocation within the group and for lending certain resource rights to others (Berkes, 2008). A group would consist of multiple families. However, the land could not be owned as it belongs to the Creator. This means that others could not be completely alienated from use, but rules and agreements among communities regulated the use.

A remaining example is the James Bay area where Cree peoples still hunt and fish. Hunting is regulated at family level and senior hunters oversee each group of families. Hunting pressure is regulated through the population participating in hunting, keeping the resource base stable. Resource territories were organised hierarchically through chiefs. Rules of sharing and reciprocity were actively expressed in customs such as the Northwest Pacific potlatches where surplus of fishing was shared among the wider community as a disincentive to individual accumulation (ibid). However, territoriality and resource sharing are not only management mechanisms, they are cultural expressions of their own right. Land is experienced as an intricate part of the identity and belonging, and generosity as the highest expression of humanness (Cajete, 2000; Four Arrows, 2013). The land is also a basis for spiritual relationship, environmental awareness and learning. A nice example is the use of Coyote stories from the people of the Columbia Plateau (Hunn in Berkes, 2008:6). These are stories usually told by the elders who may know 60 of such stories which each comprise a full evening's performance. They recount experiences and events in the local environment, where encounters with animals, plants and spirits form the stage for a human adventure in which moral precepts and relationships are articulated. Listening to these stories, children and other community members learn to approach their environment with an integrated sense of moral awareness and also sensitivity to the living beings told about.

NA indigenous peoples see humans and other beings in a symbiotic relationship with mutual obligations (Berkes, 2008). As mentioned earlier in the section on worldview, NA peoples who generally consider their wellbeing as dependent on the respectful and responsible treatment of other members of their 'community of being'. The practice of virtues such as humility, respect and reciprocity are therefore central social institutions, both for human-nature and social relationships (Callicott, 1994). This is well represented by Berkes' account of the James Bay Cree. According to the Cree, it is not the people who control the hunt but the animals. Hunters have obligations to fulfil to the animals to maintain a sustainable relationship and a continued proper use is necessary to maintain productivity of animals. The Cree also believe that animals know everything about hunters, as illustrated in the following story of hunter:

"I had a fish net out in a lake and at first I was getting quite a few fish in it. But there was an otter in the lake and he was eating the fish in the net. After a while, the fish stopped coming into the net. They knew there was a predator there. So similarly, game know about the presence of hunters as well. The Cree say, "All creatures are watching you. They know everything you are doing. Animals are aware of your activities." In the past, animals talked to people. In a sense, there is still communication between animals and hunters. You can predict where the black bear is likely to den. Even though the black bear zigzags before retreating into his den to hibernate, tries to shake you off his trail, you can still predict where he is likely to go to. When he approaches his den entrance, he makes tracks backwards, loses his tracks in the bush, and makes a long detour before coming into the den. The hunter tries to think what the bear is thinking. The hunter and the bear have parallel knowledge, and they share that knowledge. So in a sense they communicate" (Berkes, 2008:99).

The human is always considered the passive partner in the relationship. The success of the hunt depends on whether the animal makes himself available. Similarly, hunting does not work well in unfamiliar territory. *"The land is unfamiliar with him"* (ibid:100). Game is not there for the taking, the hunters need to show respect. Success is also not measured by the size of the kill, but by being able to get what you need (ibid). If expected practices of respect are not followed, it is likely that such a person catches few. Even though that person may come very close, something prevents him/her from getting the game. Hunters never get angry at the animals; they rather blame themselves. Successful hunters do share their catch, for sometimes disrespect happens accidentally. Respect is shown through a rich array of ceremonies: the hunter maintains an attitude of humility when going hunting; the animal is approached and killed with respect; the animal is carried respectfully to camp; offerings are made to the animal; the meat is butchered according to rules signifying respect; the meat is consumed according to rules signifying respect; and the remains of the animal are disposed of properly (Berkes, 2008: 103). Boasting about one's abilities is considered disrespectful. With some animals, meat is only consumed in the camp because it is a sacred place. It is said that grey jays hover over the camp to check whether nothing is wasted.

Cyclical understanding of population ecology is common among NA indigenous hunters. The Cree practice resting in their hunting areas followed by heavy harvesting, which keeps the system from a critical point in which food is depleted. It is understood that both overuse and underuse can lead to drop in productivity. This reflects a common notion among northern indigenous peoples: *"when you don't use a resource, you lose respect for it"*(ibid:113). Values of respect, connectedness, concern for future generations and humility safeguard proper use of resources. However, Amerindian groups also practice conservation through deliberate actions. For example, to conserve

fish populations various practices have been recorded to safeguard healthy populations, such as closed fishing areas, closed seasons, allowing portions of catch to escape, ban on taking small individuals, restricting some fisheries for emergency, restricting harvest of seabirds, nesting turtles and eggs of both, restricting fish traps (Berkes, 2008:87).

Uniting the physical, the social and the sacred reality of Nature

Indigenous ways of living, knowing and learning have sophisticated adaptations to the non-linear processes of the environment. In terms of physical adaptation, their management systems would incorporate risk avoidance strategies such as the use of natural environmental variation, multiple harvesting sights and high diversity of crops and species to rely on and the maintenance of reliable backup resources to meet needs should the regular livelihood sources fail (Alcorn, 1990 in Berkes, 2008:95). In their land management practices, there was more attention to ecosystem processes rather than products to sustain systems that can absorb change. In terms of social adaptation, transgenerational knowledge transfer through stories and the position of Elders in the community could help to navigate long term fluctuations in ecological processes, even beyond the scope of one lifetime. In this sense, indigenous peoples of NA were well adapted to the ecological reality that ecosystems are nested systems with complexity of interactions across scales in time and space, fast and slow processes which are hard to predict (Levin, 1999). They would constantly monitor processes in their environment through physical cues such as fat content in animals (Berkes, 2008). Social institutions regulated careful use of resources, as well as individual and collective regulation of birth-rates, harvest-rate, and all socially disruptive behaviour (Berkes, 2008). Social institutions were adapted to change through processes of social learning. Resource crises are an integral part of traditional adaptations, as they foster the renewal of management institutions. Renewal of institutions goes alongside renewal, disturbance and change processes in the landscape (Berkes, 2008).

Among many Amerindian peoples we find stories of uncertainty which supported the mental adaptation to changing circumstances. A key figure in such stories would be the trickster, who took the form of an old man or animal such as the coyote raven or hare (Peat, 2006; Cajete, 2000). The trickster would at the same time be a cultural hero. One example of this is the story of Napi, the sacred figure for the Blackfoot people (Peat, 2006)). Napi created the land out of his body but is also a fool who turns rules inside out and upside down, crosses boundaries and does foolish things. Next to the clown and trickster there is also the 'contrary' who does everything in reverse. This person would ride a horse backwards, wash in dirt or walk backwards to teach about social conventions and inhibitions. Not only in story but also in real life people can take the role of the clown, disturbing the social order in sometimes extreme ways. The role of this is to represent limits by crossing them, to demonstrate the value of order through disorder but also to show contradictory aspects of human nature. It also reminds everyone of flux and uncertainty (ibid). According to Cajete, the role of the trickster is to represent the cosmic principle of Chaos (2000). It acknowledges what in Western thermodynamics is called entropy. When order is created somewhere in the whole, it can only be done by creating disorder elsewhere (Peat, 2006). It reminds everyone that 'irrational' forces cannot be controlled and the futility of control, certainty and absolute power (ibid). The idea of flux, as represented by the trickster, not only refers to social institutions or the uncertainty of the environmental conditions. One could say that it touches on the most fundamental understanding of the world for NA indigenous peoples. An understanding that the world is essentially relational and

transformative, "*the world is movement, and movement of that movement, and movement of the movements of movement.... Relationships, relationships of relationships, and relationships of relationships of relationships*" (Peat, 2006). The visible reality is only an expression of this larger process. Therefore observation and understanding of the world goes beyond what we would call the physical level. Life revolves around living within processes and relationships, with careful attention for balance through limiting disturbance and high sensitivity to change through all means available to humans, the rational, intuitive and bodily senses (Berkes, 2008).

Shamanism, ceremony, storytelling, dreaming and visioning play a very important role in uniting the physical aspect of survival and the existential or spiritual aspect of living. Because nature is both physical and sacred at the same time, humans and other beings have the power to influence the web of life through subtle ways. A good example of this is the role of the shaman. Teachings of plants and the location of animals have not only been gathered through close observation but also through shamanistic practices. An account of an Anishinaabe elder tells how an old lady or man or animal would turn up in their dreams and tell the purpose of a plant, the medicine. Another ceremonial practice called shaking tent would enhance communication with the spirits who come to give knowledge of medicine, but also insight as medicine itself (Berkes and Davidson-Hunt, in Berkes, 2008:104). In Innu culture, a shaman is *"a person who can see through, who can foretell, who has authority, power."* He is also a group leader and respected hunter, he can find the animals with his special powers (Andre, 1989 in Berkes, 2008:111). Shamans also work as the healers in the community. Healing is not only concerned with the health of the individual. Humans are related to the environment to the extent that personal illness is explained through disturbance at the supra-individual level - in all relationships of the individual, community and environment. It is the shamans that can sense this level and act within it. To heal someone the shaman needs to address the disturbed part of the ecosystem firstly, then the actual body of the diseased person. Shamanism also plays a role in the management of natural resources (Reichel-Domatoff in Berkes, 2008:67). In the Iroquois tradition, the grandchildren of the mythical Skywoman are twins, one good one evil. These two forces represent the arena of life, they are affected by man's thoughts, acts and words. The actions of people in nature affect their own fate in direct ways, just like in the hunt. There is no non-nature category. All ways of participating in life, birth and growth, eating, evacuating, procreating, hunting and gathering or voyaging are sacred (McHarg 1969 in Berkes, 2008:114).

The sacredness and connectedness of life is represented in many NA traditions by the breath or wind. In the Navajo tradition, the beginning of time is created by Wind and Light of Dawn who gave birth to life and different breaths of Wind (Cajete, 1994). The breath of life that moves everything. Breath is what creates thought, language and feeling. Breath is what enables humans to express it in word, song, and prayer. All is breath moving. Language and all other expressions are thus considered sacred and creative. They are thought to affect the world in direct ways as sacred vibrations and so require responsible use (Peat, 2006). Also the making of art is a spiritual act with creative power, like the many ceremonial activities and forms performed to interact with the breath of the world. Nature is thus considered as a sacred expression of breath, natural forms and forces are expressions of spirit and can thus be communicated with because humans are equally expressions of spirit. This Great Soul of life cannot be understood by the intellect, it is perceived by the spirit in each person (Cajete, 1994). Personal and direct communication with spirit manifested in forces, elements and beings through rituals, prayer of daily interactions reinforces the connection of the person or group to the

Great Soul. It is from this spiritual communication that understandings of morals arise and so breath provides the people with fundamental orientation in life. Elders or people with shamanistic qualities can facilitate these experiences for the community. Awareness of spirit also serves as a vehicle to reflect on personal weaknesses and 'remember to remember' one's origin and highest possibility (Cajete, 2000). The manifestations of spirit in nature are considered primary teachers that help the individual and community to develop wholeness and balance. This is what is referred to with many recurrent phrases such as 'for life's sake', to find life, to become complete, of good heart. Celebrating life.

This presents an interesting understanding of knowledge. It is not a memorised collection of information but a living spirit in itself, independent of human beings. It is alive and dwells in specific places. The spirits of plants, animals, rocks or the wind are thus important teachers. A person may come-to-know by entering into a relationship with a living spirit of specific knowledge (Peat, 2006). For example, a person may come to know how to do a certain skill, say beadwork, by entering into relationship with that knowledge through a dream or vision. This is also the way someone can be given authorisation or agreement with the spirit of knowledge to use it. Authorization may also be given by someone who already has a proper relationship with the knowledge. These relationships come with agreements and responsibilities. The person is transformed by the knowledge because entering into a new relationship is also a process of personal growth. Some indigenous elders recount stories of language or songs coming back to them through dreams. In this view, knowledge cannot be lost, it can be re-membered.

4.2 Learning and education among North American indigenous cultures

In the view of NA indigenous cultures, the basis for learning and education is the facilitation of subjective experiences related to place through environmental, social and spiritual relationships (Cajete, 1994; Aikenhead & Michell, 2011). These relationships are in reality not separated from each other but expressed together in daily practices. Learning activities are intertwined with daily lives of teachers and learners, both of which participate in learning at all ages, except in different roles. The learning ways supported a livelihood of close communion with each other and the environment. This community provided the context and source for learning and so living and learning were intertwined. Every situation provided an opportunity for learning. Processes of learning were aimed at *"the continuous development of self-knowledge, on finding life through understanding and participating in the creative process of living, on direct awareness of the natural environment, on knowledge of one's role and responsibility to community, and on cultivating a sensitivity to the spiritual essences of the world"* (Cajete, 1994:33). Traditional tribal education involved various ways of generating experience, by doing and seeing, listening and imagining (storytelling), ritual and ceremony, dreaming (unconscious imagery), apprenticeship and artistic creation (Cajete, 2000). Indigenous education sought to be endogenous, to literally 'lead out' the inner self through enlivenment and illumination from one's own being and from key relationships (ibid). The metaphoric phrase 'seeking life' thus includes not only a search for truth, for knowing life, but also for wisdom, identity, completeness and health. To participate in life's creative process in a most generative way. The Nahuatl speaking peoples of Mexico framed this process of as 'finding one's face, one's heart and one's foundation', which expresses the search for one's character and

potential, one's passion and a way of life that supports the fullest expression of someone's self and truth (ibid:35). The process of life-long learning is often referred to as 'coming-to-know' (Cajete, 1994; Peat, 2006). It comes about through watching and listening in direct experience, participation in daily activities, but also being in the environment and the community, listening to songs and stories.

Four Arrows writes that central to learning and living in NA indigenous cultures was the concept of balance: balancing emotional, physical, cognitive and spiritual development within the group and the individual (2013). This idea of balance is strongly tied to the mandate for living in harmony within social and environmental relationships as prevention and health maintenance of the entire living community. It is embedded within the consciousness of both collective and inter-generational survival. When balance is maintained, health and vitality will follow. Various accounts report the incredible health and vitality of the early contact Amerindians compared to the European peoples at the time (ibid). The spiritual dimension of feeling deeply related to place and Nature (the force of life) was foundational to the development of balance, health and vitality. Social values of generosity, reciprocity, humility, courage and attention to conflict resolution were equally important to sustain vitality in the community and therefore played an important role in learning. Cajete expresses this balance as "*thinking of one's self, one's community and one's environment 'richly' - essentially a spiritual mindset in which one thinks in the highest, most respectful and most compassionate way, thus systematically influencing the actions of both individuals and the community*" (Cajete, 2000:276).

Cajete describes five kinds of 'knowing' that contribute to such a balanced consciousness, which are comparable to the 4 layers of knowing medicine in the picture below. It starts in the process of knowing one's place, the home, the village and the village's natural location (ibid:277). It proceeds in concentric rings from the family household, to the part of the village where the house is located, to the whole village, the surrounding land, and then to the sacred mountains or other geographical features that form the boundaries of a group's territory. The second way of knowing concerns the consciousness of relationships with people, plants, animals, natural elements and other phenomena. It is a way of self-knowing and defining the spirit that is based in relationships and emotions. It allows us to feel the differences and similarities in how the spirit expresses itself in all beings. It is based on the ability to hear, observe and feel 'spirit moving' (ibid). The third way of knowing comes from reflective contemplation, speaking and acting. It refers to the capacity to think things through and employ wisdom. It is founded in the integration of respect and other morals. The fourth kind of knowing is one that builds up through experience with all aspects of human life. This is best reflected in the ability to tell stories and hold ceremonies, through which one's accumulated experience can find expression.
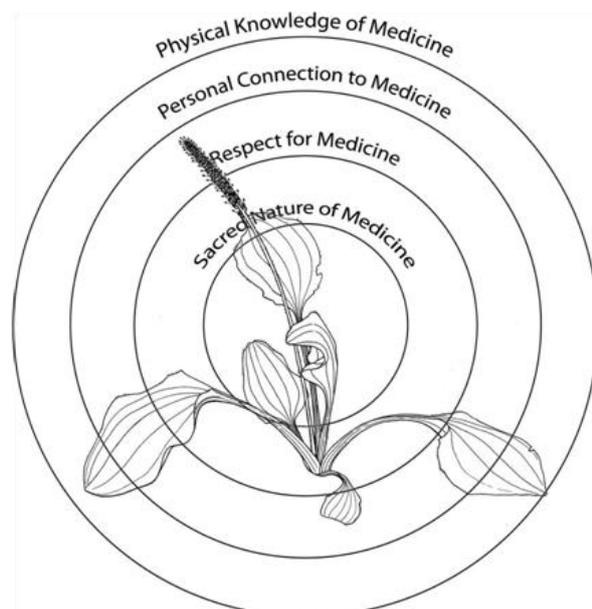
The fifth way of knowing that Cajete describes relates to a kind of multi-sensory   Figure 2:
Four layers of knowing Medicine (Marshall, 2008)
consciousness that directly knows 'the spirit'. It is most closely related to myth and dream, *'the place that Indian people talk about'*, the place of the deepest respect and sacredness, the place of the good life, the Highest Thought (ibid:279). It is often the Elders who have fine-tuned their connection to this level, however it can be achieved at any age. This sequence of states of 'knowing' describes a life-long process of coming deeper and deeper into relationship with Life in all its aspects. This is really the central goal of learning and living.

This process of living in increasingly complex and fine-tuned relationships with the world asks for a sensitive and open way of being. Peat describes how in his conversations with Blackfoot people, he came to realise the importance of silence and listening in learning. Observing the environment and listening to stories is to *"create that silence within ourselves into which knowledge can speak"* (Peat, 2006:74). Also speaking is created out of an active silence, the words speak themselves through the space that is created for them. "*It is their inner silence that allows them to listen to the prompting of the heart and to the subtle resonances that lie within each word of a language and which, when uttered, reverberate throughout the world"*. Speaking is therefore a participatory act; it influences the self and the world. Words are sacred vibrations that evoke and bring in direct manifestation other vibrations or energies. Certain words can only be spoken in particular ceremonies because they have such power that the people present may not be able to contain the energy. For the speakers of Miq Maq language, speaking is not really about describing objects but for entering more deeply into the realities of the world (Peat, 2006). When speaking English, *"Sa'ke'j (Miq Maq speaker) feels that he is being forced to interact with a world of objects, things, rigid boundaries and categories in place of a familiar world of lows, processes, activities, transformations and energies. For Sa'ke'j, the Miq Maq language is itself a world of sounds that echoes and reflects the vibrations of the physical world"* (ibid:231). Words are thus treated with great care. Cooper writes about how the NA indigenous peoples were confused by the European settlers' habitual lying for in their world only insane people, those who have lost touch with reality, spoke in ways that misrepresented reality (1998).

The native language and way of communicating is key to understanding the process of learning in the animated universe that many NA indigenous peoples lived in. It also helps to understand that the way of education was not like the Western way of instructing pieces of information or ways of doing things, but rather creating spaces for the learner to establish relationships and receive teachings. The way they are received and understood is for the learner, there is no prescribed way. Many ceremonial forms are prescribed and exact, but the learner simply participates and receives the teachings that one is ready to receive (Cajete, 2000). Therefore all people keep learning even though they have experienced a certain thing throughout their lives. Many native languages make it clear when you tell an experience whether it was your own or someone else's. Personal experience and capacity to receive knowledge from the land and the spirit are considered the most valuable forms of knowledge. For this reason Elders are respected because they have plenty. However, youth are also respected because they have fresh eyes, a unique personal perspective (Underwood, 2000). Learning takes place through active creation of learning moments, by giving instruction to watch a particular animal over a long period of time, through rituals, ceremonies and stories that provide

different levels of experience. It also takes place through apprenticeship, joining in daily activities of hunting, crafting and gathering. When a person reaches a point of confidence in the task, he or she is given the opportunity to prove the skill in private (Peat, 2006).

Living in close relationship is also a constant reflexive practice of personal growth, or in the words of Four Arrows, building character (2013). In the face of flux, always changing relationships and challenging physical conditions, health and survival depend strongly on the development of what we would call positive psychology (Compton, 2005). Four Arrows describes how fear is used consciously as a character builder as opposed to a controlling device. The overall approach in indigenous education is to steer more towards intrinsic motivation for virtuous ways rather than employing rewards and punishments (ibid). It is at the same time a way to stimulate psychological wellbeing in the individual and the group. Some indigenous writers reflect on Western culture, both in science and organised religion, as a culture of fear, which arises when "*a system attempts to manage fear by fear-based means, thus producing more fear and fostering forms of chronic mistrust, coercion and injustices*" (Ed McGaa & Fischer, 2013:248). This resonates with domination/partnership analysis and conceptualisations of the crisis of connection (Way et al, 2019). It is this culture that seems to be explicitly avoided among NA cultures through the wide diversity of cultural practices that support courage, reciprocity and balance.

McGaa writes that in their view, fear and love are seen not just as emotions but as energies with particular designs/patterns that prefigure worldviews. It is important that neither of these is blocked or perpetually dominant, so they can flow in a self-regulated way (Ed McGaa & Fischer, 2013). This is the basis for individual and social learning, as fear stimulates adaptation to stress but love heals pain and ensures integration and growth. It transforms the experience of duality into partnership or non-duality. The practice of courage and fearlessness has been an important cultural disposition among NA indigenous peoples. "*As the experience of regaining balance by transcending fear occurs over and over again, one matures and feels less and less motivated by fear and more and more motivated by a radical trust in the universe. Such trust makes it difficult for an external force to coerce or disrupt our lives in ways that cause our sense of sacred interconnectedness to be lost*" (Ed McGaa & Fischer, 2013: 248). The fearless person knows fear and listens to its signals but resists it as a basic worldview for it produces violence and disruption of relationships.

4.3 The Medicine Wheel

Many NA indigenous traditions share the symbol of a Medicine Wheel to express the process of growing into relationship and attaining physical, spiritual, emotional and cognitive balance. Medicine wheels are also symbols that represent key understandings of many life's processes. As a non-native, I cannot understand or transfer the full depth and meaning of this sacred tradition. However, it has helped me to bring together the reflections described in this chapter into a whole and translated it into a learning model. The symbol has meaning to me as it resonates with universal understandings of growth and learning in a cycle of first insight, immersion, creation and reflection that are recurrent in many conceptualisations of learning. For this work I have adopted The Great Hoop of Life by Paula Underwood, a native writer and indigenous teacher who deliberately shares this

information with the world (2000). Through the line of her family this Iroquois adaptation of the medicine wheel is used as a learning way has safeguarded the transmission of ancestral ways of learning up till the present.
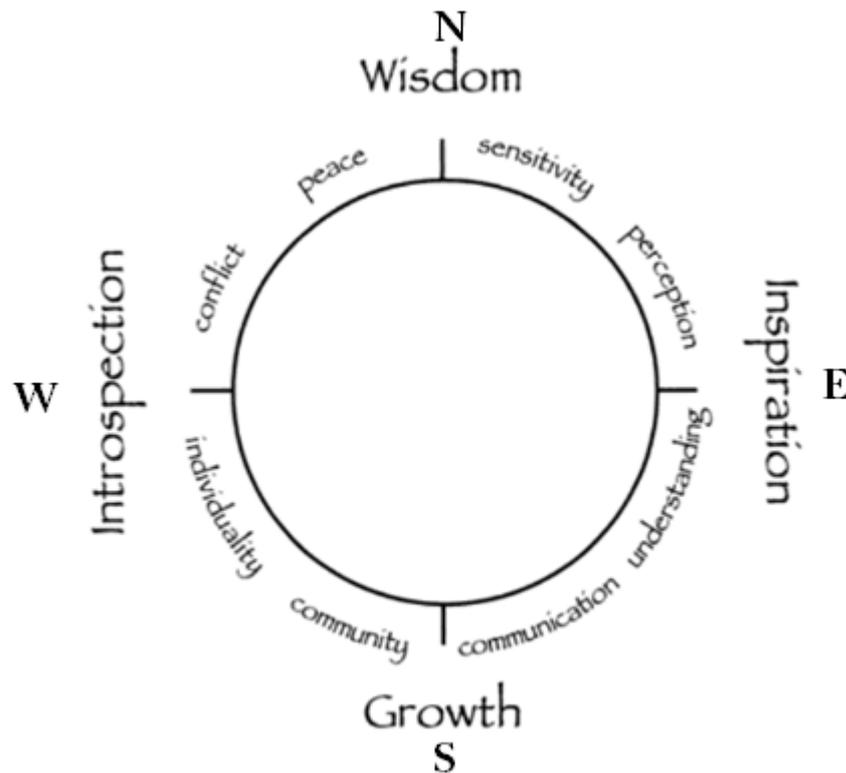
Figure 3. The Hoop of Life by Paula Underwood (2000).

The Wheel represents the processes of living and learning one's place and responsibilities within the creative process of life. Living, knowing and learning are captured at once in this cyclical process as acts of creative participation. It nests in a view of life at large as a process of becoming. It is not linear but cyclical, having no final stage. Truth itself moves and is an expression of balance, as discussed above. The steps involved in attaining wisdom reflect the concept of lived knowledge as referred to above, and the concepts of adaptive management and feedback learning. The wheel is a native expression of wisdom and skilful means, representing the fine-tuning of feedback between conceptual/imaginative and the active/applied aspects of knowing in relation to spiritual, social and ecological dimensions.

The circle can be used to represent any whole and any cycle at any scale. It can represent a small exercise with phases of exploration, understanding, application, reflection and integration. But also any personal or group process. Similar wheels have also been used to represent a person's life, with phases of youth, adolescence, maturity and elderhood. The cardinal directions represent different stages in these cycles and refer also to the seasons. They are foundational orientations in life with particular qualities and have traditionally also been linked to the four dimensions of being, the spiritual (North), cognitive (East), physical (South) and emotional (West).

The Wheel also represents the accumulated wisdom of generations over time. Underwood has developed this as a wheel representing learning or the gathering of wisdom. Medicine is here understood as a process of building towards health and completeness as described above, in the

sense of embodying enhanced wisdom, balance and personal efficacy. It is a sense of knowing how to live in the circumstances one is in, optimal living. This Learning Way is based on the assumption that each person is responsible to learn to understand who they are individually, the unique way in which they learn, what they need from the community and what they can give in return. Finding face, finding heart and finding foundation. It is driven by need and opportunity in the context of survival.

North is wisdom - Learning who you are

The circle starts in the North. North represents winter, the state of rest, integration, stillness and the inner part of being. Historically, the native peoples of America would have spent the dark cold winter months in their winter camps, relying largely on stored foods and having much time to spend together telling stories, sharing views and reflecting on life (Song & Beaver, 2021). It is the time of Wisdom, of sharing and integrating the experiences of the year and connecting them to the stories of the Elders from earlier times. Winter is the time of personal reflection, when the darkness helps to focus attention inside and reach to deeper levels of being. According to Underwood, North also represents the fundamental ability of centring oneself, to sense one's location in the complex reality that surrounds us (2000). It represents an inner place one can go to when experiencing doubt and confusion. It is also the place of silence that Peat describes (2006), and the kind of knowledge that comes from direct communication with spirit (Cajete, 2000). If you choose to let the circle represent your personal Whole then North represents all the Wisdom, all the self-understanding you have gathered, so far. Being in the North.

In any circumstance, there will be a need to be addressed because life changes or the self seeks changes. There is always a new need which creates a longing for learning and adaptation. This longing for something new creates Sensitivity. It is a state of openness. Change invites sensitivity and renewal, in balance with continuity. Also the seasons create sensitivity. One can imagine the effects of increasing daylight, the first thaws, the first greens to appear from under the snow or earth. It awakens the senses and draws the attention outward. It calls for exploration and stimulates longing towards a new beginning, dreams and wishes for the next cycle. This longing is the start of the new experience, of sensitivity for something yet to be explored. Sensitivity is considered the start of knowledge and wisdom, key to the processes of 'coming to know' and building relationships. It aligns with what Cajete calls the first layer of knowing, the surroundings of the household extending to the surrounding environments (2000).

Gradually, as our Sensitivity guides us to explore, we come to Perception. Our sensitivity has brought us to the possibility of perceiving. This resonates with how inputs are processed by the brain, creating images from inputs and thereby creating perception. The path taken by sensitivity becomes a little more formed. Perception is thus understood as constructed; "the only thing we truly know…are the nature and content of our own perceptions" (Underwood, 2000: xiv). It represents the principle that learning is personal for each individual, there is no set 'truth'.

East - Dawn brings a new understanding

The East represents Inspiration. Underwood describes it as an openness to alter one's previous understanding. Like the freshness of dawn and childhood it brings an open mind and renewed vision.

It is often a spark of inspiration that creates this inner movement to question understandings - like the spark of longing stirred the initial sensitivity. It sparks the interest to investigate relationships, the second layer of knowledge for Cajete (2000). Other things belonging to the East are play, infancy, springtime. From the dawn of inspiration there is gradual movement through understanding and communication, towards the high noon of growth in the South. Initial understanding is often wordless, you get something but do not know yet how to place it. It is pre-verbal, still whole and implicit. Languages are based on a series of assumptions. When an understanding is put into language it is automatically framed. Underwood uses the expression *"language predicts the conclusions that we reach therein"* (ibid: 20). Communication does therefore not need to be in language - sometimes oral, visual or tactile forms are more suitable. The separation of understanding and communication makes us aware of how information gets structured in our learning process. The next step on the wheel, Communication, is also important for the process of understanding. Until we have articulated some understanding we cannot be sure whether we have really captured it and stored it in ourselves. Articulation is also a form of manifestation and creation, as discussed above. It precedes the next level of creation, doing. Additionally, communication creates a connection to understandings beyond our own through sharing it with others.

South Gives us Growth - Allowing change

The South represents Growth, the enactment of change in the complexity of reality. It is a coming to know of an understanding by putting in practice. Ideas need to be lived in different versions to get to know them. It gives essential information to be able to make decisions from the understanding one has in combination with specific contexts. Relationship is deepened through practice. It reflects the third way of knowing from Cajete (2000), that comes from reflective contemplation, speaking and acting. It refers to the capacity to think things through and employ wisdom. The South holds the high energy of action and focus, the summer of the circle. In terms of life stage it relates to adolescence and young adulthood, the time of taking one's place in the world.

Community and individuality form the body of context for the experience of a certain knowledge. Any practice is situated in a living community. Practices may have different effects on individual and community level. Community can refer to the human or the larger community of life. The effects become clear through the duality of community and individual. They can be indirect, diverse and non-linear. Practices also become culturally shaped by the community, and vice versa. Without the experience of community, we cannot know whether something is wise. The dialectic of community and individuality brings understanding of what is wise at different levels of the community. Practically, it is the exploration of how an idea turns out in the complexity of practice, where both the social and physical context come into play. Important here is the exploration of how individuality and community work together or create conflict. In many native traditions, community is considered wise when it allows maximum possible learning, growth and development to each individual. Individual freedom may be restricted for the survival of the community. An individual is wise who gives to the community, who understands reciprocity. This part of the wheel also represents the process of habituation, when practices become part of daily life and knowing becomes living.

Sitting in the West - Learning from the experience

The West represents the fading energy of day or the year, the harvest season, the time for rest in the late afternoon, the setting sun and ripe adulthood. It is often a time of sharing and celebration after the high activity of the south. It marks the stage of a process where activity resides and introspection starts. There is space to take inwards the full experience of sensing, perceiving, understanding, articulating and living an idea or need, to digest and evaluate it. Here is where an experience is connected to deeper values and beliefs. It is the counterpart of inspiration, which is a movement of opening up. This resonates with the fourth kind of knowing from Cajete (2000), as one that builds up through experience with all aspects of human life. This is best reflected in the ability to tell stories and hold ceremonies, through which one's accumulated experience can find expression.

Between introspection and wisdom, there is both conflict and peace. Part of integrating an experience is the acknowledgement of where it caused friction and where there was synergy. The previous step of individuality/community has made this clear. It is the role of emotions to evaluate harmony. It is an awareness of how the thought-activity of previous steps blends into inner values and beliefs. This is also a point where one's beliefs might change due to the new experiences and where new paths arise to explore which fuel the next cycle. Like the answering of one question always brings new questions. Conflict and difference bring new energy if they can be integrated into a whole. Conflict and peace represent the dynamic of change and continuity in the system and in the social community. Some people seek change, others protect continuity. The balance of both is essential to wisdom. Wisdom is the capacity to integrate difference, the new energy in community. Otherwise the community shrinks. Peace is the effective inclusion of difference.

Returning to the North - Gathering Enhanced Wisdom

The North represents the total of experience and one's complete being. It is where experience is fully integrated internally, in the deepest place of our being, making a new whole from where to set forth. It represents the fifth layer of knowing from Cajete (2000), the fully multi-sensory consciousness that directly knows 'the spirit'. It is also the mystical place that can be felt inward, *'the place that Indian people talk about'*, the place of the deepest respect and sacredness. It relates to Elderhood, a fine-tuned consciousness with balanced physical, emotional, cognitive and spiritual capacities. It is also the nighttime of telling stories, where experience is integrated in shared metaphor and vice versa. And it represents accumulated knowledge over generations. This sequence of states of 'knowing' describes a life-long process of coming deeper and deeper into relationship with Life in all its aspects. When living through these steps, different aspects of 'coming to know' are experienced and integrated into one's existing way of being. In real life these steps do not follow a clean sequence, yet we can recognise important phases of learning in this cycle. It stresses the importance of different levels of learning. When they are related to the cardinal directions and seasons, it becomes easier to get an intuitive or felt understanding of these processes.

Further understandings of the Wheel

The learning cycle works as an effective mind image that conceptualises and organises complex and multi-layered understandings of being and learning. The full circle represents how living, knowing and learning are one process. Perhaps not only for humans but for any living entity. Through it we can feel ourselves part of a larger evolving consciousness that takes a multitude of pathways of

knowing life through the many life forms. The Wheel symbolises general processes of manifestation and transformation as ongoing movements of spirit through a dialectic of outward and inward movement. The cycle of life and death, of order and disorder, solar and lunar energy, activity and rest. Personal growth and learning are related to medicine in the view described earlier, that people but also other entities can grow toward increased wholeness with fine-tuned balance. Each of the steps is a medicine in the sense that it stimulates growth or brings an essential energy in the whole.

In the cycle one can both recognise the whole as well as sequences at the same time. It represents the Wholeness of Life, the individual steps around the Hoop represent the sequential way we tend to understand it. Life is considered whole and understanding always partial. The Wheel offers a way of integrating sequence and wholeness. Both are essential to learning, where lineal thinking is viewed as a necessary path for exploring an option of reality, but it is always only one path in the whole forest. It contains both a logical sequential path following the steps on the ring, as well as wholeness in the cyclic process. The dialectic of whole and differentiation also represented within each quadrant, sensitivity and perception, understanding and language, community and individual, peace and conflict. It thereby links these two modes of consciousness in a learning process, the logical and the intuitive. The interaction of the two within each quadrant enhances understanding and growth of the thing at hand. For instance, the act of communicating something reveals how it is understood and facilitates better understanding. Understanding the nature of community helps to understand how each individual develops within that and understanding the nature of individuality helps to understand community dynamics (Underwood, 2000).

Underwood writes how these two ways of perceiving and learning have been well understood in Native American cultures. Both aspects are essential for understanding and learning. This was used also in storytelling, using detailed, chronological information about the environment but also rich imagery and emotion as they speak to both sides of the brain, logical sequence and imagination. This information becomes relatable to the personal experience and part of experiential learning. In Underwood's tradition, this was referred to as walking on two legs. According to Underwood, Western culture relies nearly almost on logic, hopping only on one leg. Knowledge and learning then become disconnected from the whole and the whole self. An example of this are the sometimes-meaningless summations of information in Western education. *"Logic only functions to the extent that the database is relevant"* (*ibid*:xviii). Wholeness is the final database - any sequence of information is only relevant if it connects to the whole.

The Wheel also recognises the value of multiple perspectives and stages of learning/living. Underwood writes that *"the only thing we truly know…are the nature and content of our own perceptions"* (*ibid*:xiv). Therefore, many native traditions had not a habit of argument between people holding different perspectives. Rather each person would state their perspective and leave it to the audience to develop their own from the combination things being said. Each perspective is understood as a place within a whole. It represents where you stand in terms of life experience and who you are. The view from the mountaintop is equally valuable as the view from the valley. This dialectic mode of discovering new information and continuously linking it to the whole of human experience creates a deep form of learning. It involves all aspects of being human, which Underwood also frames as the spirit, the mind and body. Each of these 'places' give another perspective or experience and create stability.
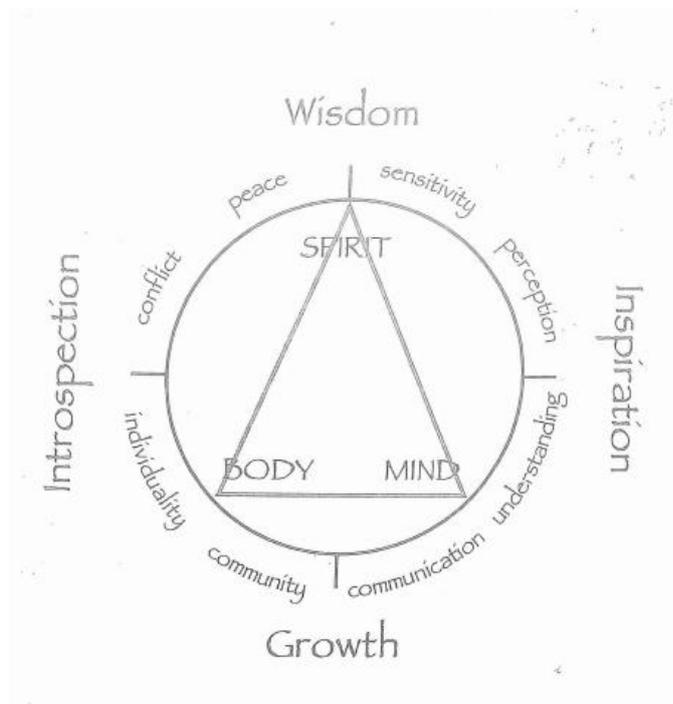
Underwood places Mind between understanding and communication, the energy of the East, a clear view. The interaction of community and individuality provides the Body of our circumstance. Spirit sits in the North with wisdom, the silent and ungraspable. The dream, the mythical, the night. Walking the Wheel can help us to check whether these aspects are in balance within a process.

The balanced interplay of wisdom and growth (action) on the North and South points is representative of the dialectic mode of wisdom and skilful means that is expressed in late Buddhism through the perfection of Wisdom. Wisdom is the ability to perceive the whole while growth is the ability to act within that. This interplay forms the foundation of a productive approach to life as reflected in the worldview of the world as lover and self. The heart, body and mind are our different tools for living this wisdom and growth.

The process of living is also tied to the physical reality of survival through a dialectic of change and continuity. Underwood writes how this understanding has been represented in the Wheel with symbolic animals (2000). The Being of the East is Eagle and represents the capacity for Vision. Eagle flies so high that he or she can see the past, present and future at once. Eagle thus sees the flow of change, the River of Life and senses its direction. Eagle wakes us up to the dawn of change, which is the energy that draws us from stillness in the North towards sensitivity. The task of Vision to the people is to alert for change.

The Being of the South is Mouse. She is thought to be a she, and a great learner. She has incredible sensitivity. Her long whiskers and great ears tell her many things. She can squeeze herself through any crack and knows to find every stored grain. Mouse is a give-away person; she gives to her community. She could give it all away and starve herself. Mouse needs Elk to be reminded of herself (Underwood, 2000:83).

The Being in the West is Bear. Bear is he or she, a Great Experimenter. The Bear is the wanderer, lumbering around deciding each step where to go. The Bear balances Eagle, being on the ground following any path, step by step in the moment, without overview. Eagle sees the change coming, but Bear goes on to discover what to do about it, step by step. Bear is good with details, toying with possibilities until something works. Eagle and Bear combine sky and earth.

The Being of the North is Elk, the Great Provider. He is considered a he and provides well for himself and his direct family. But he tends to forget about the larger community. When the day comes he

needs his community, there might be no one to help. Elk needs to be reminded of community, Mouse and Elk balance each other's Wisdom.

Underwood writes how these symbols incorporate a very fundamental understanding of life and survival. It recognises that life grows on the edge of continuity/stability and change. Continuity is provided by survival, which is the balancing of individual and group needs. Elk and Mouse are two ways of enhancing stability that balance one another. East and West are the change of night turning to day and day becoming night. Eagle and Bear are two ways of coping with change which balance one another. People can feel affiliated to these positions by character but also in a process. Interesting is that the survival strategy of Elk is considered male. Underwood describes how both man and woman can have the tendency of Elk and Mouse, but that men generally tend more towards Elk while women tend more towards Mouse. This resonates with other culture's perceptions of masculine energy as the 'individual' side of being one and the feminine as the oneness aspect of being, as described in the theoretical framework. A similar organisation can be recognised in the bear and eagle - the whole and the particular - although in Underwood's tradition they are not related to sexes. One could say though that Western science has emphasised the Eagle strategy of creating top-down overview, being slightly outside of life, motivated by a sense of risk, while lacking the perspective of being *in* life, the bottom-up approach of Bear. The sexes are not the main focus points, but rather the interplay of two structuring life forces. The Wheel represents how they are equally necessary for life to exist, every being is both an individual entity and an emergent part of a whole.

4.4 Key findings for wisdom-in-action learning in higher education

4.4.1 Summary of North American ways of living, knowing and learning

The foundation for NA indigenous ways of living, knowing and learning is a **worldview of unity and interconnectedness**. From this it follows that the main purpose of living, knowing and learning is to **find one's place and responsibility within the relationships that comprise life.** This is abstractly referred to as 'seeking life' or 'coming-to-know', and more personally as finding face, heart and foundation. This is both a matter of **survival and meaningful participation** in creative unfolding of the mystery of life. **Spirituality** is embedded in the physical and concerns the **sanctity of personal and community relationships** to the natural world. **Living, knowing and learning are therefore situated within an ecological, social and spiritual context**, which are not separate but rather different qualities or levels of interaction in the same reality. Knowledge is lived, translated like 'ways of living in nature'. Living, knowing and learning are processes of **participating in the landscape in lived and storied ways.** Within this view on life, the individual is a creative participant in a social, ecological and spiritual reality in which relationships at all these levels are to be maintained and balanced. This is a mutual **process of co-creation** where **all beings are animate,** and so have their own direction and identity. Humans are therefore just one expression of nature and **non-human beings are considered important teachers.** Through building relationship with all

human capacities **(emotional, spiritual, cognitive and bodily),** this knowledge can be integrated into one's being. This is done through doing and seeing, listening and imagining, ritual and ceremony, dreaming, apprenticeship and artistic creation. From this process, not only knowledge is created but also **morals, awareness of responsibilities, personal growth and balance or completeness. Personal experience is the centre of learning**, and so processes are different for everyone. They are connected through shared metaphors in community practices. Personal views are respected and valued, leading to diversity within the group.

There are no objects and **perception is emergent from relationships,** just like 'truth'. It changes and evolves. **Knowledge is considered a living spirit,** independent of humans, that can be 'known' by coming into relationship with it. Human qualities of **perception, tool making and story making** are foundational to build relationships. Especially **storytelling** forms a basis to link ecological, social and spiritual aspects of relationships. Detailed information about the landscape and its species is connected to the articulation of moral precepts and spiritual relationships. It is also an important community activity, creating a basis for linking each person's personal experience to that of the group, and connecting/contributing to **ancestral memories** passed over generations. **Stories encourage both factual and imaginative ways of knowing**. All human ways of knowing are considered important, including rational, and are optimal when combined. The concept of left/right interactions of the brain are known in some traditions. **Storytelling is also ceremonial**, as it is part of establishing and maintaining relationships. **All activities are considered sacred,** and therefore spirituality is integrated in daily activities. Language is also sacred, as its vibrations are thought to have a direct, creative effect on the web of relationships.

Connected to this deeply relational worldview are v**alues of respect, reciprocity, care, integrity, sensitivity, humility, generosity and concern for future generations.** These values play an important role in maintaining good relationships at all levels. NA indigenous peoples also **used rules and agreements for resource partitioning** within and between communities. Some of these social institutions were hierarchically based. However, **land** was not just considered a territory, it was also the basis for **identity, belonging**, spiritual relationship and learning. Land could not be owned as it belonged to Creation. Indigenous peoples had **in-depth knowledge of the land**, its species, ecosystems, population dynamics and seasonal patterns. **A variety of livelihood strategies,** such as hunting, gathering and various forms of farming were combined to ensure risk spreading, but also as a form of identity and exploring potential. Na indigenous peoples understood ecological processes well and used them to manage **extensive and intensive productive systems**. Various techniques were used to direct successional patterns, such as fire. **Complexity and nonlinearity of ecological processes** were dealt with by using a broad and varied resource base, as well as rules-of-thumb and indication cues for monitoring processes in the landscape. Through these practices, they employed **adaptive management**, which "*takes a dynamic view of ecosystems, emphasises processes (including resource use) that are part of ecological cycles of renewal, and stresses the importance of resilience, that is, the buffering ability of the system to absorb change without breaking down and going into another state of equilibrium"*. **Social learning at individual, community and institutional level** is part of this adaptive process, and is facilitated by community activities. Uncertainty and chaos, as functional parts of complexity, are also dealt with through using **humour and storytelling**. The example of the trickster illustrates this. Humour plays an essential role in learning and community life in general. Human 'weaknesses' of greed, selfishness, jealousy or other socially disruptive

behaviours are recognised as part of humanity, but actively discouraged through positive motivation of the 'highest possibilities' and through restrictive social institutions. There is an intention to **balance individual and community needs.**

The process of living and learning is **organic, place-based and integrative.** Understandings of life as **cyclical and seasona**l work as metaphors for structuring, balancing and understanding different phases of learning and development. Some phases that are recognised are sensitivity, perception, inspiration, understanding, articulating, growing, relating to community and individuality, introspection, conflict, peace and attaining wisdom. This is an organic integrated sequence that can represent processes at any scale. **Learning is considered a lifelong activity.** Learning is understood within life's dynamic of **continuity/stability and change/differentiation.** A balance of top-down and bottom-up responses to change is required for balanced development.
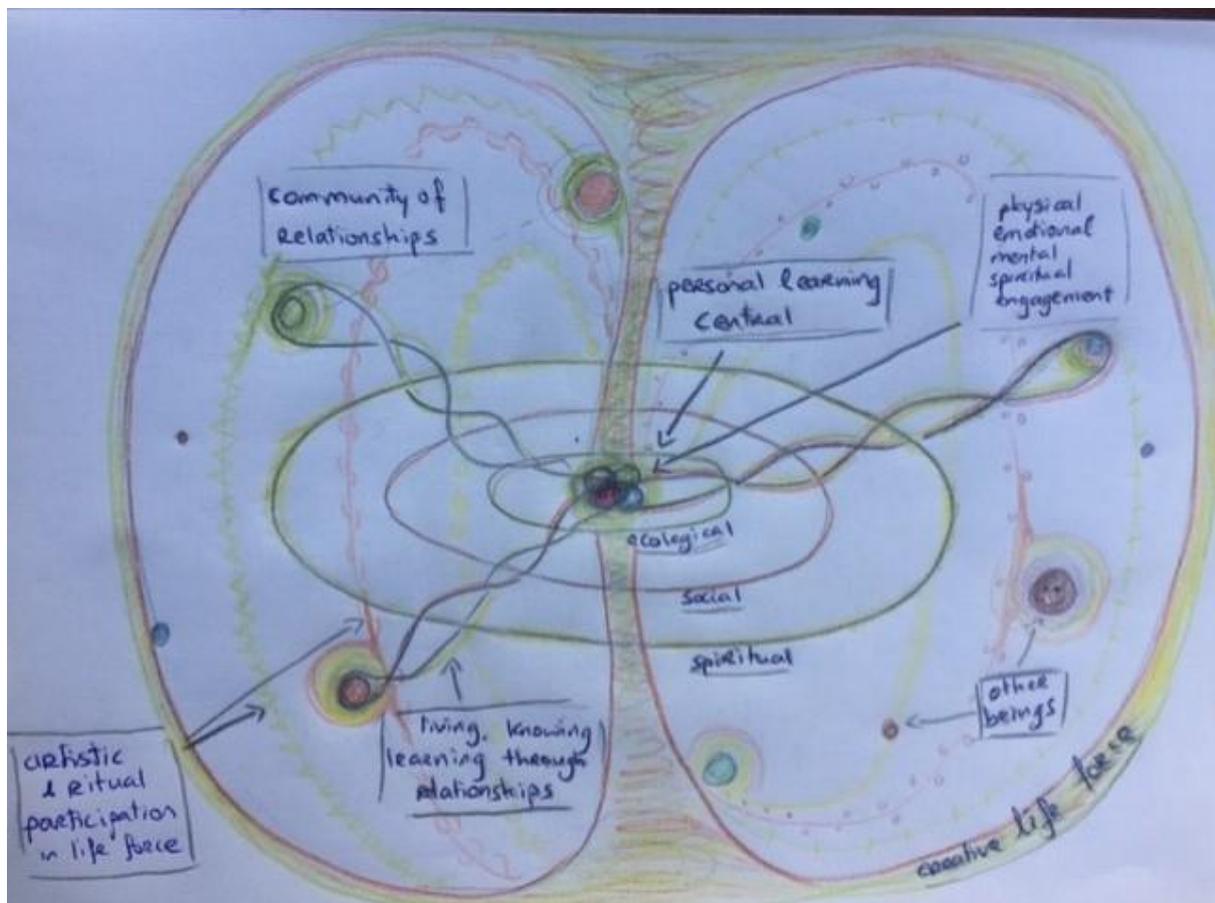

Figure 4. An illustration of living, knowing and learning in NA indigenous cultures.

I have illustrated the findings above in a sketch. Here one can see the learner in the middle, interacting with other beings in the community through layers of relationships. The four colours of the learner represent cognitive, emotional, physical and spiritual qualities of learning. All are

included in the creative process of life, which runs like an eternal vortex around and through everyone. The lines are interactive and constitute relational interactions. Thus everyone creates the process of life. Artistic creation and ritual are exemplified with the decorations on the lines. The rings in the middle designate the discussed ecological, social and spiritual layers of relationships. Everyone interacts with each other through these layers. They build a foundation for life, a livelihood, represented as a flat disc that holds an individual in the middle. In reality all others are included in the rings. I have depicted it this way to take the position of an individual learner.

4.4.2 Linking North American ways of living, knowing and learning to a partnership/domination framework.

The North American indigenous ways of living, knowing and learning as described above generate deeply relational ways of being in the world that expresses a sense of full partnership. I have used the example of NA indigenous ways to create an overview of important partnership qualities as I have understood them from the literature, and from my own experience with 'coming to know'. Below I have depicted an overview of my understanding of NA indigenous aspects of partnership in their living, knowing and learning, as opposed to my analysis of domination in Western culture, as described in the introduction of this thesis. The cycle depicts different cultural aspects, and their respective expressions in partnership (outer ring) and domination culture (inner ring). This depiction is a simplification and does not reflect the complexity within each culture. It works rather as an orientation on the spectrum of domination and partnership, now more concretely expressed in various cultural traits. Perhaps the edge of the wheel is where the two meet in balance. Or perhaps a culture thrives when the outer rind always holds the inner. Here, I take these poles as directions to move between, sometimes it is required to move in, but as a permanent place of being it gives problems. We move back and forth, like breath or like the oscillating movement of a snake around the circle. The snake of life, finding its way of becoming.

Let's go around. At the core of North American indigenous culture is the principle of unity and the idea that meaningful participation is the purpose of life. The other extreme is the principle of separateness which leads to material survival as purpose. This then relates to the centrifugal and centripetal ways of experiencing the world, where the centrifugal is more sensitive to other beings as agents which NA indigenous cultures experience as animism, while the centripetal is more sensitive to the world from needs/goals/ideas of the centred 'self'. The centrifugal leads to a kind of perception that sees relations more than things, and where perception is more open-ended, changing and moving. Perception is part of the creative flow of life. On the other pole, perception is guided more by the instrumental needs of the self, it is more goal oriented and is more focussed on parts, or details, rather than integrating whole and parts in a continuous dialectic.
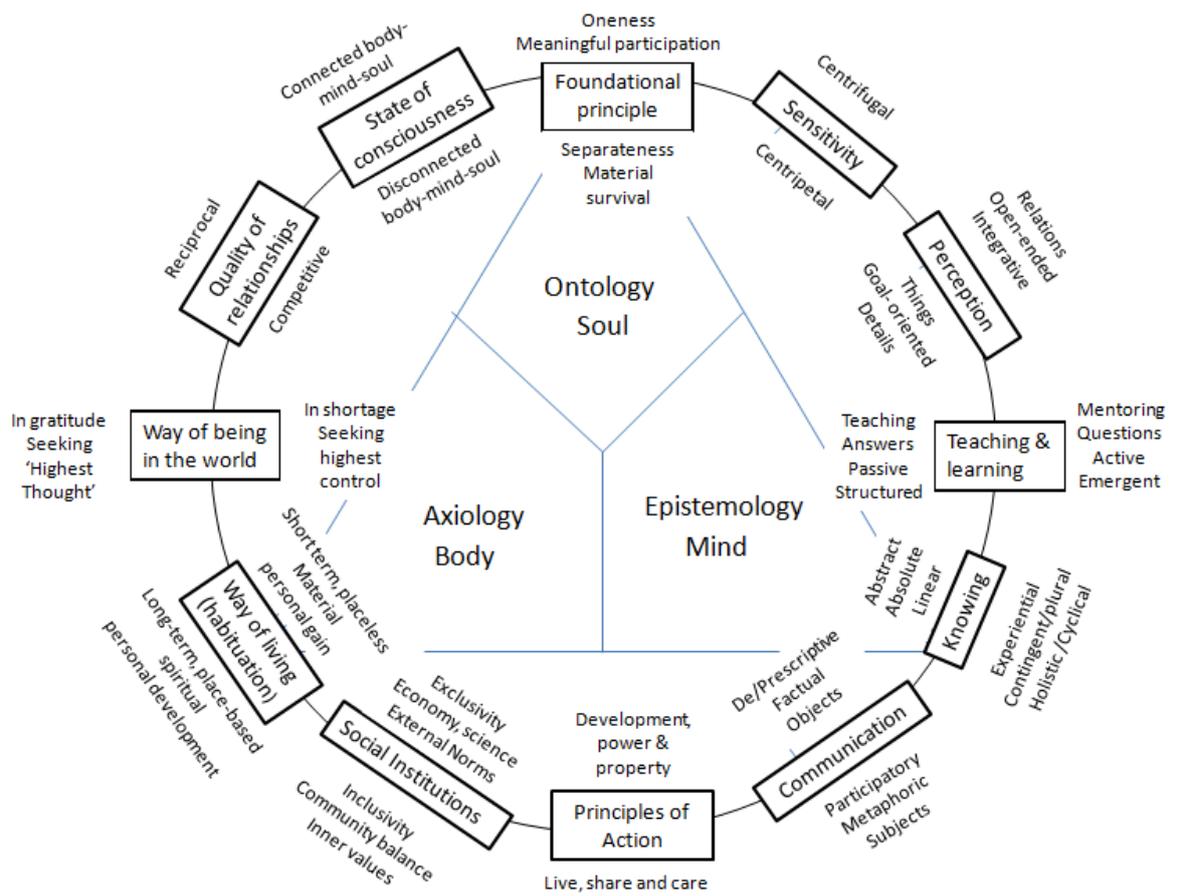
Figure 5. The circle of life living, knowing and learning

This then relates to a way of guiding the exploration of the world, learning method, where mentoring questions is the main activity rather than teaching answers. Each person's experience is the centre for learning, rather than 'a truth' that needs to be taken in. The process is active and emergent rather than passive (absorbing) and structured. The knowing that follows there is rather experiential, contingent, plural and holistic rather than abstract, absolute and linear. Language and communication are participatory in the sense that they are meant to build mutual relationships with subjects. In the case of NA cultures, they are active vibrations that participate in the creation of the world. This is in contrast to more noun-based language to demarcate objects, which is rather de- or prescriptive. Communication among NA indigenous cultures is also more metaphoric than factual, it speaks to the imagination.

The next category I have called the principles of action and relates to guiding values. In North American ways of living, priorities of living in the process of life, sharing resources and caring for relationships are central. On the other extreme we find the idea that society needs to develop towards something, and having power as well as property are important. Also having power over life's process, or nature. In terms of social institutions, these priorities are supported with a sense of balancing community among NA indigenous peoples, inclusivity of individual and community needs, diversity and difference. Although rules definitely have a role in social organisation, it is mostly the practising and remembering of inner values (original instructions) that forms a foundation for constructive behaviour. On the other extreme we find social institutions that differentiate more than

include, and that regulate constructive behaviour through external norms and punishment. Economy and scientific knowledge are two guiding societal pillars that shape social interactions in Western culture, rather than community balance. The overall way of life in NA indigenous cultures is characterised by focus on long-term and place-based existence, where spirituality and personal development are central in life. On the other extreme we find a focus on short-term, placeless survival, with a tendency to value the material side of life and personal gain.

For NA indigenous peoples, this integrates into a way of being in the world in gratitude, which links to seeking the 'Highest Thought' throughout life, expressed in an attitude of humbleness, respect and generosity. On the other extreme is the society that integrates the wheel into a feeling of shortage, which stimulates to seek the highest control. The quality of relationships among NA indigenous peoples is more reciprocal than competitive. And the overall state of consciousness is one where body, mind and soul, or spiritual, emotional, physical and cognitive elements are (attempted to be) integrated. This connectedness helps to experience unity in the world.

The steps on the wheel appear to reinforce each other, solidifying the principles of unity and separateness along the way. This also means that any activity on the outer ring can help to transform a tendency on the inner ring. In the next chapter we will look at how learning elements contributed to the transformation of these cultural traits in the context of the Ecological Design and permaculture course.

5. Education Design Research

Case study: Ecological Design and Permaculture

The experimental design of this research is enacted within the space of an existing 6 ECTs master level course named Ecological Design and Permaculture (ED&P). This course was initiated in 2013 as an applied science course in which students can practise with the application of ecological design for real commissioners with a plot of land. The course initiator and coordinator is a transformative person by character and aims to make science more inclusive by inviting other ways of knowing, teaching and learning in his courses. I have been involved as a student assistant in the course since 2019, initially for assistance in preparations and teaching activities, later also in the content of the course. The initial setup of the course is transformative, however there was a need to make this more specific and thought through in the course content and process. The course coordinator very enthusiastically invited me to use my research for the improvement of the course in terms of its transformative capacity, so I have chosen this course as a case study to test my transformative learning framework. It also offers insight into how transformative learning can be implemented in an existing course, rather than constructing a new one from the start.

The course is already transformative in various ways. Permaculture as an approach to designing human-nature interactions in the landscape is radically different from conventional approaches to farming, landscape architecture or nature conservation. It was formally founded by Bill Mollison in the 1980's, and has grown into a worldwide movement since then, mostly among DIY'ers and off-

grid communities. It has never gained ground in science, despite its relevance for many sustainability issues. It is often framed as a hippy hobby rather than a serious tool for developing more sustainable livelihoods. Many principles and ideas are also found in for example, the agroecology movement which has gained more scientific recognition (Altieri, 2018). Permaculture is in many ways comparable to indigenous ways of living, as it takes a place-based holistic approach to living in nature, with appropriate technology, food production based on ecological processes and a strong focus on community development and ethics of care (Mollison, 1991). However, it is not grounded strongly in ecological theory because it lacks scientific support. Although it proposes partnership as an ethic, it does not provide actual learning approaches for building partnership culture. In terms of learning approaches, the course is place-based in the sense that students get to learn by doing as they are asked to design a system for a real client, which can be a farmer, household, community or other type of land user. However, these are sometimes far away, even abroad. The course could be grounded more in the place where the students live. The approach in the course is practice oriented and integrative instead of merely theoretical and analytical. Some components also address intuitive approaches to place-based design, such as the lecture on 'genius loci' - which in landscape architecture is understood as the spirit of a place. However, the main mode of acquiring knowledge has been to listen passively to lectures and visit a series of example farms. Although the course intends to be integrative of head, heart and hands, the learning activities are not actually designed to support this. Much of the course experience depends on the course coordinator telling stories, rather than providing a variety of learning approaches that independently create a diverse learning experience. With the prospect of this particular course coordinator leaving in 3 years' time, it is important that the course accommodates this.

The course is a relatively easy environment to experiment with the aimed transformative learning approach, as many elements are already in place. My involvement as a student assistant has already given me insight in the course procedures, making it possible for me to oversee the process and design changes. This made it possible to really redesign a whole course, which is a rather outstanding opportunity being a master student. Lastly, I believe that this course can function as an inspiring example for others because of its radical approach.

In the next section I will explain how the course has been initially built, so as to give an image of the starting position of this process.

5.1 Initial set-up of *Ecological Design and Permaculture (FSE-50306)*

An overview of the course is depicted in Appendix 1. The course takes place over a time span of 4 weeks in May, with full time engagement. Central to the course is a design assignment in groups for a real-life client with a plot of land. These can be farmers, hobbyists, schools, neighbourhood groups or other community initiatives. In the first week, the students are prepared for this assignment through a diversity of lectures, excursions and self-study. After taking a content exam, the students start with their design process in the second week of the course. There are several evaluation moments. In the final week the students make a presentation and final report for their commissioner. The course is finalised with a reflection exam.

The learning goals of the course as formulated as follows:
- know the scientific and intuitive interconnection on farm level between the agro-ecological, the socio-economic and the cultural aspects of farming systems
- are able to apply the 10 designing principles of Permaculture on farm level
- are able to assess the sustainability of their (re)designed food production system
- are able to reflect on their own learning process and design capacities

Assessment is as follows:
- Open book content exam (individual) 30%
- Poster/presentation of design (group) 20%
- Design report (group) 20%
- Reflection exam (individual) 30%

The overall atmosphere in the course is open and exploratory. The course coordinator Kees is a gifted storyteller and shows resemblance to a traditional Elder. His courses are never boring as he relates aspects of the course to stories of his previous career living in Uganda or his experiences with many farmers in the Netherlands. Kees speaks more from experience than from theory and aims to stimulate reflection, inspiration and curiosity among the students. He believes learning should be enjoyable. Kees is also humble in the sense that he learns from students and from the people invited in the course. He facilitates a learning process for the whole group rather than being the expert transferring packages of knowledge. In fact, his technical knowledge is limited and he feels that students already get enough of this. He likes to cross boundaries and discover radical propositions. He also regularly brings spiritual stories or anecdotes in his teaching. A famous teaser he often uses is to measure the aura of a banana in class with his dowsing rods.

In the initial setup, Kees would invite many different guest speakers about topics related to landscapes, food or business in the first week of the course. The combination of topics has changed every year depending on the availability of guest speakers and new contacts of the course coordinator. Theoretical readings are assigned about a variety of topics. There is usually plenty of time for questions and discussion, the coordinator stimulates this by asking questions and evoking reaction through making statements. In the first two weeks, students also visit a series of example projects, among which a food forest, an integrated orchard and some smaller CSA (community supported agriculture) or permaculture farms. As reflected in the first learning goal of the course, there is explicit attention for the combination of scientific and intuitive knowledge.

Through the design process students visit their design site at least once but sometimes the students go multiple times or camp at their site. They have to look into the landscape dynamics and social dynamics of the place to make a design. It is mostly a self-guided group exercise with supervision on demand. There are two reflection moments with the course coordinator, who sometimes invites guest speakers in these moments. The focus of the design process is on creativity more than the potential for actual implementation. Usually the groups consist of students from many disciplines, which makes the overall level of knowledge more generalist rather than specialised. The main goal is to open the mind of the land holders towards new ideas instead of providing a precise technical plan.

The plans are presented in a celebratory setting with drinks and snacks, usually in one of the barns at the university farm. All commissioners are invited. The design also needs to be described in a report handed in the next day. The final day of the course is reflection day in the form of a 'reflection exam' where students need to answer both reflective questions about both content and personal learning topics. Up until 2020 this reflection exam was graded.

5.2 Re-Design of *Ecological design and permaculture*

Rooting in reality: creative participation in the landscape through lived and storied ways

The redesign process of EDPC started in February 2021 and involved Kees the course coordinator, and another student assistant Jordy. The three of us also collaborate in a food forest project that is being developed at the university farm and are like-minded in many ways. Jordy supported the technicalities of online learning, but also contributed much technical knowledge.

Based on the theoretical insights from indigenous ways of living, knowing and learning in combination with my personal experience as described in the previous chapter, I started a creative and fuzzy process of change. It has not been possible to integrate every aspect of NA indigenous cultures, because some aspects, like animism, also need proper introduction for which time was lacking. I looked at the program and tried to find spaces for change without taking away fundamental components. We worked through an iterative process together in which I would propose changes which we discussed and implemented where possible and if applicable to the course situation. Working within the boundaries of an existing course, within a relatively short time span of preparation and within a team of people who also have ideas and wishes for the course, it was only possible to bring a selective level of changes. Another added challenge was that the course took place during a peak moment of the corona pandemic. Most classes needed to be given online and bus excursions were not possible. In the next sections I explain how principles of indigenous learning have been translated into the course redesign.

Worldview of unity and interconnectedness, spirituality and storytelling.

This course already addressed a worldview of unity and interconnectedness through the systems perspective of permaculture. However, instead of just learning about it as theory we included course elements that enhanced the sensed experience of interconnectedness. This is also related to the topic of spirituality. In earlier versions of the course, this has been touched upon mostly between the lines through the stories of Kees. One existing course element, the genius loci lecture, was related to sense of place or the spirit of place. In this lecture, a guest speaker would tell about the Greek concept of Genius Loci which is used in landscape architecture. Connected to the genius loci lecture we included a meditative session related to sense of place, followed by drawing and sharing (see appendix 2b). Thus we included an element of storytelling to each other, also a way of ceremony to affirm one's personal connection to place. Instead of being a vague concept from a lecture, it became an actual experienced and shared reality.

In addition to this, I created three reflection assignments. For a full overview, see Appendix 3b. The reflection assignments were meant to bring an element of reflection at the level of personal worldview and relationship to the living environment. The topic of spirituality and animism I found the most sensitive and challenging to bring in, as it is a taboo in the world of science. Because of this sensitivity we considered it best to introduce these exercises in a personal reflection format, because students may not feel safe or comfortable enough to openly explore these topics in a group. The assignment could be completed individually throughout the course with a deadline to hand in at the end. It was presented as a compulsory but non-graded exercise as part of the course and part of my research. The students could give consent to use their reflections as data for the research.

Home assignment 1

In the first assignment the students are asked to read three chapters from the book Braiding Sweetgrass by Robin Wall Kimmerer. Kimmerer is a botanist and NA native descendant of the Anishinaabe who manages to bridge the worlds of science and indigenous ways of living and knowing through various stories of plants and the environment. Her approach is conciliatory and appreciative of both worlds. Her work seemed very appropriate to introduce students to an indigenous worldview while staying connected to their scientific background. Her work is also fitting as it draws the reader into a felt relationship with the world that is full of wonder and appreciation. It reveals the depth of experience of indigenous peoples and the beauty of their reciprocal culture. This exercise links to spirituality as situated in nature, storied participation in the land, belonging, factual and imaginative knowing, non-human beings as animate teachers and values of respect and reciprocity.

Home assignment 2

In the second home assignment we invited students to sit next to a plant for 5 minutes every day and just observe. It invites students also to observe what they feel inside themselves when they do this. This exercise was meant to invite students into a direct, consciousness relationship with a non-human being and see what it would bring them. It addressed aspects of nature as teacher, lived participation in the landscape, personal experience as the centre of learning, balancing different ways of knowing, and sacredness.

Home assignment 3

The third home assignment links to the design project. For the field visit to the design site, we included an audio file that lets students experience the landscape from the perspective of another being. We tried to let them become the other being in their imagination (see appendix 2d). In home assignment 3, they take this perspective again but now evaluate their design from the perspective of a plant, animal or other being. The exercise invites them to really feel into the being, how it moves, what it likes, how it uses the landscape. And then evaluate how their lives would be if the design they made would be developed in real life. For a week, a month, a year, a decade. They are asked to describe this mental journey from the perspective of the being, and also to include a reflection of this exercise in their design report. This combination of exercises addressed the worldview of interconnectedness, nature as teacher, values of respect and care, different ways of knowing, perception as emergent from relationships and in-depth knowledge of the land.

Learning community: meaningful participation through personal experience in diverse ways of learning

In this course, personal experience has already been important to learning but we have made it more explicit and central. This was done by offering a larger diversity of learning methods that address different forms of knowing, and also by providing a wide diversity of perspectives on the topic of ecological design. The course coordinator Kees had already used the narrative of head, heart and hands in the course, but this was made more explicit in the added course elements and literature. We have included more technical lectures but also practical and more sensed/spiritually based approaches as described above. Some of these were theoretical in the form of lectures, but mostly these were people from practice relating to their experiences in story. I see both as forms of storytelling, but the later involves more relational processing. Both the lecturers and practitioners consisted of a diverse group of people. There were no straightforward answers and the students were given the challenge to make sense of their own, through their experiences in the practical's, morning exercises (see below), excursions, the reading and through these stories offered in the course. Discussion was actively stimulated in the online learning space by the teachers through asking questions and offering propositions that invite reaction. The diversity of viewpoints reflected conflicting views and uncertainty, really rendering it impossible to just follow somebody else's ideas. This way we addressed the process of co-creating knowledge and the principle of contingency and truth as emergent from relationships.

Students were challenged to reflect on some fundamental societal beliefs about efficiency/productivity and explore the options of working with ecological processes with controversial speakers who work at the forefront of developing complex agricultural systems. Central to all approaches is systems view on life. We addressed a variety of ways in which humans can manage the landscape, creating both extensive and intensive systems and using a variety of livelihood strategies. We have used the baseline theory of permaculture, with the 10 design principles and ethics of earth care, people care and fair share, but created a broader theoretical base more connected to the concept of adaptive management. We have included lectures on animal and plant ecology. In a lecture on ecological principles of design, we have included a part on indigenous land management systems to show that permaculture is in fact not new. Through these slight adjustments in the theoretical approach, we grounded permaculture in a context of actual survival rather than a hippy hobby (which is the popular image of permaculture). In this way we addressed the principles of survival, complexity and uncertainty that are central to indigenous understandings of the physical world, and in-depth knowledge of the land.

We have also included an elaborate session on the social and economic side of permaculture. In this session, a series of farmers spoke about their ways of dealing with these realities, after watching two informative documentaries together. This session really emphasised the balance between individual and community need, as well as ethics related to social relationships. Here it became clear that rules and agreements are also necessary for resource partitioning, as well as trust. Lastly, we have also included more technical support and skill learning in the course. This related mostly to the use of various design tools, digital, conceptual and practical, as well as knowledge of species and cultivars. These were offered in the form of skills training throughout the design process. This addition really

completed the combination of cognitive, emotional, spiritual and embodied knowing. In this way, we have somewhat addressed tool making as an important indigenous way of learning.

The above-described variation of speakers also created a sense of community. This is also supported by an elaborate introduction session on the first day where the students could get to know each other in a playful way. The course coordinator Kees is very talented in creating a welcoming, safe environment through the stories that he tells and the way he interacts with students. There is room for feelings, emotions and personal observations. Kees also uses plenty of humour to tease people into new perspectives. He does not take a position of authority but is more interested to explore questions together with students, to which he does not always know the answers either. Questions and remarks from students were taken seriously and received with a sense of appreciation. He embodies a sense of humility and respect for every viewpoint. By giving me and Jordy as 'just' student assistants the space to contribute elaborately to the course, we create a feeling of equality and personal value. Community and collaboration were enhanced by organising the reflection sessions for the design together, rather than just speaking with the supervisors. This addresses learning at individual and community level. Through the interaction with the commissioner, the learning goes further. We also created more community by starting a WhatsApp group for students to share whatever inspirations with each other.

It is also evident in the course that you do it for yourself. There is no pressure to hand in assignments or to participate. If students do not want to be there, they can go. Intrinsic motivation is stressed. But you have to do the course requirements to pass of course. In that sense it stimulates students to find their own place in relationship to the world, from a very earnest concern for the well-being of the planet. We made this more clear this year by changing the examinations. The content exam was rather an exercise to integrate the learning deeper rather than to 'test' knowledge. The same counts for the reflection exam at the end of the course, which was no longer graded. The design assignment is graded, but because it is made for real commissioners, the emphasis lies on making a good design for them rather than performing for a grade. The focus on personal development, intrinsic motivation and the fact that ecological design directly deals with the very practical issue of survival in face of our global crisis, makes it very real. This context of actual survival or at least meaningful participation in search for sustainability is the foundation for 'real' learning in this course. Everybody involved in the course is very sincerely engaged in finding solutions for a liveable future. This passion and involvement creates a sense of common purpose and belonging.

Values have already been included in the course as permaculture itself includes a strong ethic of earth care, people care and fair share. The foremost way in which these principles had been addressed in the course before was through the design assignment and reflection at the end, where students would have to assess the sustainability of their design. This year the concepts were also used as reflection tools for the many different farming systems that were discussed in the first week. Reference to the head, heart and hands also added a sense of ethics to the course. These tree concepts also add to integrating social, ecological and spiritual contexts of life. Ethics of care, generosity, humility and respect were mostly fostered by example of the teaching team, in the ways we interacted with one another and with the students, as described above. The literature from

Braiding Sweetgrass has added a level of depth to the aspect of value. Especially by linking it to the design in the home assignments.

Learning as cyclical

The various stages in the cycle of learning as presented by Underwood have informed the restructuring process in the overall course flow, at the level of the entire course, the weeks and the days. The overall course flow already follows a cyclical process of introduction/inspiration in the first week toward understanding and growth in the 2nd and 3rd week through practice, ending with introspection and reflection in the last week. I observed that especially in the first week, most sessions were classroom based in the form of old school lectures. There was also no particular logic to structuring the day.

We changed the structures of the day, as well as the topics and learning formats throughout the week. Every day, the students were invited for a morning exercise. Instead of starting class at 8.20 as scheduled, we sent the students a wake-up exercise. For a full list of the morning exercises, see appendix 3a. I show a selection here to exemplify the course element.

1 Walk around in your neighbourhood and answer the question: does it actually support people and other living beings in their life?
2 Walk around the neighbourhood, where do you see opportunities to grow food?
3 Which animals live in your surroundings? Imagine you are a goat or chicken; how would you experience this place?
4 How does your neighbourhood affect the interactions of people? Does it stimulate community? Why (not)? What could help?
5 Go to a tree, stand next to it. How do you feel? Go to a shrub, do the same. How do you feel? Go to a person, same. How do you feel?
6 Walk around in your neighbourhood, observe the bark of different trees; why are they so different? What could be the reason for that?

Nearly all exercises ask the students to go outside and explore their environment with a question in mind to stimulate sensitivity. In this way we addressed the principle of participating in the environment in lived and storied ways. The course progressed, the observations became more precise and detailed. These exercises were also meant to stimulate a sense of place, personal relationship to the environment and as a form of practising meditation. The combination of these approaches was meant to resemble the indigenous process of learning from nature as a direct teacher, facilitated by questions. The students would discuss their observations in the first 5-10 minutes of class in buddy groups. Sometimes it was discussed in the whole group. Observation of the local environment was also meant to prepare them for the ecological design process. The first 7 exercises are also an introduction to the topic of the day. A few of the exercises touch on ethical aspects or group collaboration.

As described above, we changed the topics of the first week and put them in order of inspiration, deepening of (ecological) understanding, community aspects (social/economic understanding) and spiritual context (sense of place/relationship to the land). For a detailed view, see day to day

changes below. Each of the topics was embedded in a theoretical base of lectures and literature, combined with an experiential element. They supported each other. Unfortunately, we were limited in offering outdoor elements due to corona, but we managed to integrate two afternoon sessions: a bike excursion devoted to observing and understanding landscape dynamics, with different soils, microclimates and vegetation types, and a working afternoon at a diversity of farms. Both of these excursions focused on more bodily ways of knowing. The other experiential elements were online, but were focused on the senses, observing and questioning. We added a day reflection as the end of each day to integrate the topics of the day.

We have also structured the design assignment a little more compared to previous years. The start of the design process is introduced with a new lecture that includes a cyclical design framework, with steps that help the students to deal with the complexity of designing. It guides them through an iterative process with increased level of detail. The process of designing makes the learning organic, place-based and integrative. In the design students need to deal with continuity of the place while adapting it to the changing environmental demands and wishes of the commissioner.

Missing elements

The following elements did not get translated into the course: knowledge as a living spirit, ancestral memories and ritual and ceremony, apprenticeship and artistic creation. We have had ideas about including arts, but the course was already full. The concept of knowledge as a living spirit feels like a topic that needs proper introduction and more time to delve into. It was not suitable to introduce that in the rush of this course. The same counts for ancestral memories. Considering how foundational spirituality is for NA indigenous cultures, its translation into this course was minimal. This was also due to its sensitivity. I feel that after this first trial, I feel more confident to bring it in.

5.3 Detailed schedule

In the next section I explain how each of the sessions in the course was redesigned. In the first week of the course, there is reference to learning processes on the wheel. I have used these steps in the wheel from Underwood to structure the sessions.
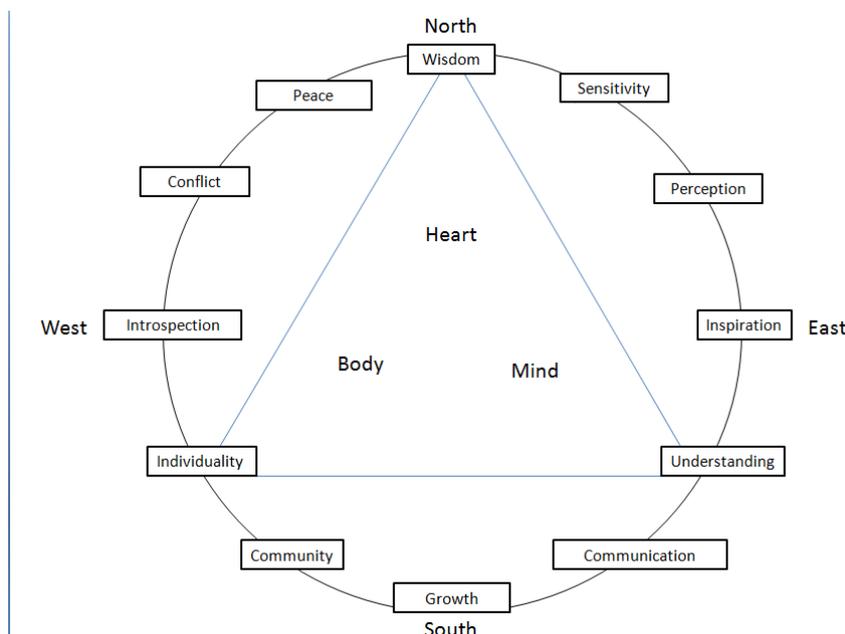
Part I: Introduction to Permaculture

Day 1
Topic: Introduction.
Process: Sensitivity, perception and inspiration
The focus of the first day was naturally on introduction of permaculture concepts. The introductory lecture was left unchanged, as it addressed the process of starting sensitivity, perspective taking and inspiration quite well. In the afternoon the first excursion was planned to Fruittuin van West, an integrated orchard that is rather innovative in terms of ecological and economic approaches. We chose to start with an excursion on the first day to stimulate sensitivity, perspectives, inspiration and starting understandings by visiting a real-life situation. Unfortunately the excursion needed to take place online, which was done by filming the farmer and lecturer and live streaming questions from students. Students were asked to observe how principles of ecological design and permaculture are put into practice. In previous years this exercise would take place in the developing food forest Droevendaal at the university farm. In 2021, there was not much to see yet about design choices, for this reason we changed the location.

Monday		8.20-9.00		
		9.00-9.50	**Part 1. Introduction to PC**	Intro to Programme
		10.10-10.50	Zoom session	Meeting each other
		11.00-11.50	Zoom session	What is Permaculture?
		12.00-12.50	Zoom session	Intro to the 10 Design principles including design sites
	Break	12.50-14.00		
		14.00-14.40		Self Study + Home assignments
		14.50-15.30		Self Study + Home assignments
		15.50-17.00	Online excursion	Online excursion to Wil Sturkenboom Fruittuin van West
		17.00-17.20	Zoom session	Day reflection and closing

We also included reading on the first day of the course. In the previous years, reading had often been scheduled at the end of the day in 'left over time'. But following the energy of the day, I proposed to have reading more centred because it is an activity that requires quite some attention. Conceptual understanding comes in sequence between inspiration and growth, which in this case were represented by the morning introduction and the practical field visit in the late afternoon.

Day 2
Topic: understanding and working with nature
Process: Inspiration and understanding
The second day of the course has previously always started with an excursion to Ketelbroek, the most famous food forest in the Netherlands. This was left unchanged, because an excursion is a good start of the day stimulating sensitivity, perception and inspiration while working towards understanding. Also this excursion took place online unfortunately. However, the lecturer was able to make it very interactive and interesting due to his good communication skills. We took advantage of the time-saving that resulted from the online excursion and planned a theoretical lecture on ecological design of food forests by Wouter van Eck (the main pioneer in the Netherlands) afterwards. Normally this lecture would take a whole afternoon on another day. In this sequence we could address both practical and conceptual elements of learning in one morning, following the entire sequence from sensitivity to understanding. In the afternoon I introduced a new element in

the course, a bike-tour to different areas in Wageningen with the aim of observing and relating landscape dynamics. For an outline of this course element see appendix 2a. Students visited three different areas with different ecological conditions. In each of these areas they had to observe and discuss interrelated aspects such as soil, vegetation, microclimate, energy cycles and land use. They also needed to reflect on human influences in the landscape and how these could be generative. At each site, the students learned to take soil samples for a jar test and use an auger. Relating to the cycle, this course element addressed the integration of sensitivity, perception, understanding and

Tuesday		8.20-9.00		Morning exercise
		9.00-9.50	Online Excursion	Online excursion to Food Forest Ketelbroek with Wouter van Eck
		10.00-10.50		Online excursion to Food Forest Ketelbroek
		11.00-11.50	Zoom session	Lecture Wouter van Eck, start exercise
		12.00-12.50	Zoom session	Exercise
	Break	12.50-14.00		
		14.00-17.20	Biking tour starting at Droevendaal Farm, Kielekampsteeg 32, Wageningen	Biking Tour to 2 locations around Wageningen to recognize the 10 PC design principles and to implement a landscape interview: Soil auger, pH paper, Soil Jar test

communication. It was also an important opportunity to go outside and have real life contact with the students to increase a sense of learning community.

Day 3
Topic: theoretical understandings of key ecological processes
Process: Conceptual understanding and application in practice (growth)
On day three of the course, we focused the attention on theoretical lectures. This created a focus point in the week - connected to the South of the learning circle. The various impressions and inspirations from the first two days were put into various theoretical perspectives. We added two new lectures to the course about ecological processes for design, one of which mostly focused on successional dynamics in soil-vegetation development, but also the influence of (animal) disturbance in these cycles. This theory was exemplified by showing how it is put in practice consciously in the

Wednesday		8.20-9.00		Morning exercise
		9.00-9.50	Zoom session	Ecological processes for design
		10.00-10.50	Online excursion	Case FF Droevendaal
		11.00-11.50	Zoom session	Ichsani - nutrient cycling for farming systems
		12.00-12.50	Zoom session	Ichsani - nutrient cycling for farming systems
	Break	12.50-14.00		
		14.00-14.40		Self Study + Home assignment
		14.50- 15.30		Self study + Home assignment
		15.50-16.30	Zoom session	Animals in permaculture
		16.40-17.20	Zoom session	Animals in permaculture

Droevendaal food forest. The second one focused more in depth on soil and nutrient cycles in the context of farming systems, and the role of animal migrations in large scale nutrient cycles. At last we planned a lecture specifically on the role of animals in the ecology of permaculture systems. This lecture is more practice focused, however connects to the theoretical understandings of previous lectures. This day covered the most important concepts and theoretical understandings of ecological design, building on the impressions of the first days and laying a basis for growth and practical application by the students.

Thursday	FREE	Ascension day	

Day 4: Free day

Day 5
Topic: Social and economic sides of permaculture
Process: Growth, community & individuality, conflict
During this day we addressed the real lived experiences of ecological farming through two newly introduced course elements. In the morning we addressed the socio-economic reality of ecological farming systems. Because of the corona situation, we chose to watch two films together online about different community supported agriculture (CSA) models in the Netherlands. CSA's could be viewed as modern forms of traditional community land use. In some models, the land is literally a commons, owned by the community or even bought off the market, otherwise the land is owned by the farmer or other landowner. The farmer's income is secured by the community through subscriptions. The risk and the gains of farming are shared by the community. Due to the high diversity of crops that are grown, the risk is spread. After the movies, we organised a panel discussion with three leading figures in the CSA movement, each of which found their own way to address the economic challenge of CSA's and build a sense of community around their farm. Through this discussion, the tension between individual wishes and needs of peoples as opposed to community functioning became very visible. It was also evident that there is not one way to go about it, and that values matter in decision making. It was interesting to have one more capitalist oriented speaker, and two more socialist speakers. The issue of gender in agriculture was also raised here.

Friday		8.20-9.00	**Social Permaculture**	Morning exercise
		9.00-10.20	Zoom cinema	Two films: Heerenboeren and CSA film + disccussion
		10.30-10.50	Zoom discussion	Discussion with Gert Jan Jansen former farmer at Hof van Twello
		11.00-11.50	Zoom panel discussion	Panel discussion with Elske Hageraats + Klarien Klingen (CSA farmers)
		12.00-12.50	Zoom panel discussion	and Gert Jan Jansen
	Break	12.50-14.00		
		14.00-17.20	Practical	Just working and talking with a Farmer!
				On a few locations around Wageningen,
				farmers put you on an afternoon job!

In the afternoon the students went to work in smaller groups spread over 8 different farms in the vicinity of Wageningen, including various CSA vegetable gardens, a vineyard, a food forest, a dairy farm and flower/berry farm. The main goal of this course element was to let them experience the practical reality of farming, some students have never actually been on a farm. An additional goal was to speak with the farmer about all kinds of topics, the practical part of farming but also personal motivations behind their farming choices. The afternoon was also meant to give space for integration and reflection.

Day 6:
Topic: Making Sense of place
Process: Introspection, feeling, conflict/peace, being
On the last day before the exam, we addressed the topic of sense of place. The morning starts with an introduction of the concept of Eco literacy, which is one's ability to read the landscape both in material and intuitive ways. Through a small quiz students get to see how their own Eco literacy level

is. This is followed by a lecture about the genius loci, which in landscape architecture is the spirit of a place. It is the subtle impression of a place that is important information for design. All of these elements have been in the course since the beginning and are meant to open a door towards more spiritual and intuitive understandings of the world. The concept of Eco literacy and genius loci are only mildly spiritual, which is functional to the university where more spiritual approaches would not easily be accepted by the students.

Monday		8.20-9.00	**Ecoliteracy**	Morning exercise
		9.00-10.20	Zoom session	Introduction to Ecoliteracy + Quiz
		10.30-11.20	Zoom session	Explanation on the Genius Loci
		11.30-12.20	Zoom exercise	Exercise on Sense of Place
		12.30-12.45	Zoom session	Reflection on exercise
		12.45-13.00	Zoom session	Presentation of Design teams
	Break	13.00-14.00		
		14.00-16.40	Self Study	
		16.40-17.20	Zoom session	Instruction on Content Exam, Question Hours and short reflection Part 1

After these two elements we brought in a new course element focusing on personal sense of place. An external teacher came in to explain the concept of sense of place and guide a meditative exercise in which students had to remember a place from their upbringing that they felt attached to. This feeling was explored in the exercise, after which they were asked to draw their place. The whole exercise was discussed in break out rooms following the question: what makes you feel connected to places? It was also discussed how the concept of sense of place may play a role in permaculture design. The full exercise and lecture material can be found in appendix 2b. The day is closed with the discussion of the design groups, where students can still indicate their preferences. Kees always tries to give students the design site that inspires them and puts great effort in finding the best choice for all. This also counters the usual top-down ways of working in academic education. The afternoon is free to prepare the content exam the next day.

Day 7:
Topic: Open Book Content Exam
Process: Gathering wisdom

On this day the students do an open book content exam on the first part of the course. The exam can be found in appendix 4a. The choice for an open book exam is based on the philosophy of the course that learning should not be focused on pure memorisation of 'knowledge packages' but always include a process of reflection and connecting experiences with information. This aligns with indigenous interpretations of learning. Answers to the questions are marked, although we have discussed the option of making it pass/fail. The experience of Kees is that marking does stimulate students to study more seriously. For the year 2021 a new exam was made in which the new course elements were integrated with theoretical perspectives. The questions also cover the full range of aspects, from practical design to ethics and sense of place. The focus of the exam is on personal perspective based on argumentation and experiences from the course. It really challenges students to integrate the various perspectives that passed by in the course and formulate their personal position. This form of personal perspective-taking aligns with the indigenous notion of multiple perspectives and integration of knowledges into wisdom.

In the afternoon the students are prepared for the next part of the course, this is discussed in the next section.

Part II of the course: Designing

The second part of the course consists of nearly two weeks of designing. In the scheme below one can see both part II and part III of the course, I will discuss them in sequence. In both parts we made relatively little changes, however some important new elements have been added. In this section, I have not rearranged the program according to the wheel, however the elements of sensitivity, understanding, communication and especially growth through the creation of a real-life design are implicitly in place.

Part II	Day		Component	Topic
	7	Af	Lecture	Instruction on Design steps 0,1 and 2 and a trailer on step 3
	8	Full day	Group	Visit design Site - Client & Landscape Interview
	9	Mo	Workshop	Basics in Digital designing & Map making
		Af	Group	Designing time
	10	Full day	Group	Designing time
	11		Free day	Pentecost
	12	Mo	First Draft Design	Individual Design teams reflect live with teaching team in parallel sessions
		Af	Group	Designing time
	13	Mo	Workshop	1. Agroecology and Companion Planting exercise
			Workshop	2. Calculating water/nutrient balance/ earthworks
		Af	Group	Designing time
	14	Mo	Workshop	1. Intro to Species, Cultivars, Rootstock types
			Workshop	2. Question hour with Will Sturkenboom on fruit cultivation
	15	Mo	Group	Designing time
		Af	Second Reflection plenary sessions	Design teams reflect on each others work live in 2 parallel sessions
Part III	16	Mo	Lecture	Instruction for report writing and presentation
		Af	Group	Design time
	17	Full day	Group	Design and report writing
	18	Full day	Poster presentation	Poster - Presentation market in 2 parallel groups of 8 teams
	19		Group	Report writing and handing at Report at 18.00 hours
	20	Mo	Self study	Preparing reflection exam
		Af	Individual Online reflection exam	Reflection exam

Day 7:
Topic: Instruction for the design process
Part II starts with an instruction session for the design process and site visit after the content exam. This instruction session has been improved by giving it a more theoretical basis. The other student assistant in the course had completed a master's thesis on food forest design and created a framework. This was introduced in the course to guide the design process. The framework follows a cyclical process similar to the cycle of learning represented in the medicine wheel which made it extra suitable for the course restructuring. The framework helps to split the process into steps without losing sight of the whole. An overview of the framework can be found in Appendix 1c.

Day 8:
Topic: Site visit
Another element that was added to the course was an additional exercise to the site visit. When students visit the field site for their design project, they need to take a landscape interview and client interview. The landscape interview is much like the biking tour of the first week, where they observe landscape dynamics, microclimate, vegetation, animal tracks and take soil samples. The client interview is much like the conversation they had with the farmer during the working afternoon in the first week. They gather information about the client's wishes and motivations for redesign. In addition to this, we have included a self-guided audio exercise that enables students to take a relational perspective with a (living) element in the landscape. This can be an animal, plant, insect,

microbe or even the air, the soil or the water. An audio guided message guides through a meditative process in which they are invited to feel into an element and how it experiences the landscape and what it needs to live. The students are asked to take this along in their design process. The student handout and text of the audio message can be found in Appendix 2d.

Day 9
Topic: start designing & map making
After the field visit the students make a start with the design process. In the morning they can follow a skills workshop that was newly introduced to the course. Here they learn how to use several digital designing programs and some other tools that help in the process. They have to start communicating their observations from the field visit and their knowledge of design into a first sketch design. The application

Day 10: Design time

Day 11: Free day (Pentecost)

Day 12
Topic: first evaluation
On this day the first evaluation of the designs takes place. This used to be done separately for each group, one by one visiting the teaching team to discuss their design. In the spirit of community learning we changed this to a set of parallel plenary sessions which fortunately could take place live. Students present the observations from their design site and the first ideas for design. A round of feedback is given by the group of students and teaching staff. Another change we made is that we invited experts (either from university or practice) to sit in and give feedback. This was inspired by the community learning in traditional cultures. The students are asked to share their first sketch with the client and receive feedback. By presenting their ideas to an audience of practice, the idea is 'tested' at least conceptually, and therefore growth takes place. Trade-offs of the design for the individual client and community of life in which it is embedded become clear in the process.

Day 13 and day 14
Topic: Designing and skills workshops
To support the students in their design process and make the course more applied, we added some skills workshops. In the first week of the course, there is little space for skills learning and it also makes more sense to introduce these in the moment where they are going to be applied. The skills workshops included topics of agroecology and companion planting in annual systems (e.g. how to make combinations of crops); calculating water and nutrient balances, and calculating earthworks; how to select specific species, cultivars and rootstocks in perennial systems and one session about practical management of working with woody species focused. Students could choose which workshops to follow and share their skills later on in the design group. This was also inspired by the community learning in traditional cultures, where everyone can learn from one another.

Day 15
Topic: Second evaluation moment

This second evaluation moment takes the same form as the previous one in parallel sessions. Students present their improved and more detailed designs.

Part III of the course: Report writing, presentations and reflection

Part III	16	Mo	Lecture	Instruction for report writing and presentation
		Af	Group	Design time
	17	Full day	Group	Design and report writing
	18	Full day	Poster presentation	Poster - Presentation market in 2 parallel groups of 8 teams
	19		Group	Report writing and handing at Report at 18.00 hours
	20	Mo	Self study	Preparing reflection exam
		Af	Individual Online reflection exam	Reflection exam

During the last week of the course, the students can finalise their designs and work towards a final report and presentation. The course is finalised with an elaboration reflection.

Day 16
Topic: Instruction for report writing and presentation
The students are given short instruction on the report writing and poster presentation. They need to include the stepwise process of gathering information from the design site, translation into a sketch design, an explanation of how they have applied the permaculture principles and eventually the details of the final design. A good report gives a clear overview of the integration of principles and needs into the design.

Day 17
Topic: report writing and presentation making

Day 18
Topic: presentations and celebration
The poster presentation for the course always takes place in a celebratory way in one of the barns of the university. There is food and drinks, and the commissioners are invited to come. In a carousel style, all posters are presented simultaneously over several rounds. This gives a diversity of feedback and discussion.

Day 19
Topic: Final Report writing

Day 20
Topic: Reflection exam
On the last day of the course, the students have a free morning to relax and integrate their experiences of the course. In the afternoon there is a reflection exam. The name reflection exam was left unchanged, because it also included some content reflection questions on the design (which were graded). The rest of the reflection was in the form of a survey (see appendix 4b). The survey offered me essential data for educational design research. In the questions I asked the students to link course elements to important learning steps in the course, using the circle of courage and fear (figure 2). For example, I asked them if they found certain elements of the course to be inspiring, and if so which ones. The survey was also meant as a last learning element that stimulates the

integration of the course with the students' personal viewpoints, values and ideas about life. Through the survey questions they are invited to reflect on their worldview and how their learning experience has contributed to any changes.

6. Results

Due to the corona restrictions at the time of giving the course, it was difficult to get insight into the experience from the students apart from the survey at the end. The course was offered in hybrid form, which meant that most sessions were online but the two excursions could be taken offline in the first week. Later on in the course it was possible to host the reflection session in a live classroom setting. Some students were not present in Wageningen and followed the entire course online. This has created a different learning experience for this group. There is no free space to interact due to the online setting. Due to illness I was not able to attend the two outdoor excursions in the first week, which could have been an opportunity to mingle. The enthusiasm of the students for the course topic was noticeable in their involvement during the online lectures and guest sessions. As we progressed through the first week, the discussions in the zoom chat intensified and students asked many questions. The morning exercises were not always discussed due to time constraints, but when we forgot to send one exercise to the students one morning they were clearly disappointed. It is not sure however, how many students eventually participated in all the exercises. For the home assignments, we know that 41 students complete the first one. The home assignments and the morning exercises were introduced to the students as part of my thesis research. It was mentioned that they were compulsory for passing the course, but that they would not be graded. We also did not keep check of whether we participated in the morning exercises. Eventually, the students made up their own mind about it, some participated fully and others only partially.

6.1 Profile of the students

In total 67 students took the online reflection survey at the end of the course. About 60% of the group identified as female, 47% male and 3% other. Most students came from the study backgrounds Organic Agriculture, Plant sciences, Forest and Nature conservation and Biology. Most students grew up in the Netherlands, followed by Italy and Germany. There were a few students from Asia, Africa and North America.

Study background

- Organic Agriculture 43.3%
- Other 23.9%
- Plant sciences 16.4%
- Forest and Nature conservation 9%

Country of upbringing

- Netherlands 46.3%
- Italy 16.4%
- Other EU 10.4%
- Germany 9%
- Asia 7.5%
- Africa 6%
- North America 4.5%
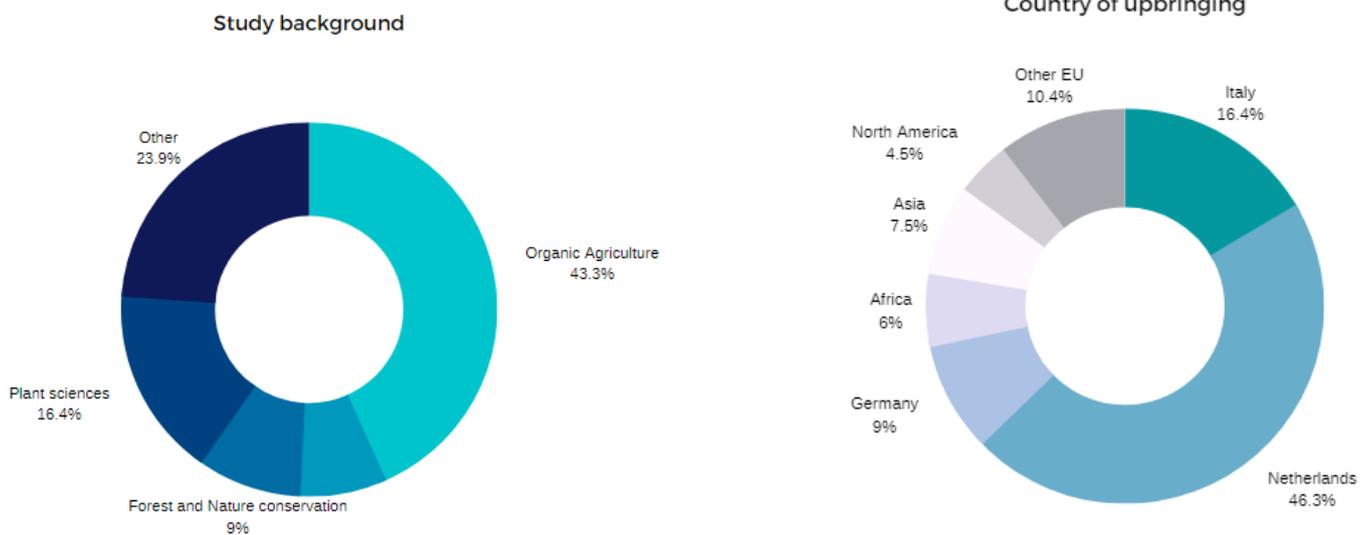
Motivation

The students described a variety of motivations to join this course. Most often mentioned were the **general interest to discover permaculture** and **the practical focus of this course**. Many students **already had experience with permaculture** through working on farms, documentaries, books, regular permaculture courses or other study activities, and wanted to deepen their knowledge and grab the opportunity to apply it in a real case. Many students had heard of permaculture and were curious about **the academic perspective** on the matter. For many, the general **holistic and environmental approach** of permaculture was appealing. Others were triggered by the **recent societal interest** in alternative farming systems. Many students mentioned **Kees' inspiring way of teaching**, which some of them had already experienced in a preceding course. They appreciated his intuitive approach, diversity of perspectives and the fact that he treats students as equals. Some students came for the fun and ability to do something creative. A few individuals named specific reasons such as understanding perennial systems, working with animals, curious about indigenous knowledge, the local focus, reconnection of people with nature and the search for viable systems in today's economic and societal structure that can create grassroots movements in changing our food systems and capitalist consumer mentality. Some students also indicated career motivations.

Relating to crisis

The vast majority of students express that **they are affected by the global crisis in various ways.** Only 8 students state that they do not feel affected, but with this they often mean that their physical lives continue unchanged. Only a few indicate that they are emotionally also not affected. A small group of around 5 students is affected by the crisis in very direct ways because they come from a family farm. For the rest students are more psychologically affected and alter their life's choices.

About half of the students say that they experience **emotions of sadness, anger, anxiety or hopelessness** in relation to the global crisis and their future. Some explain how they struggle with the **immensity of the problem**, the amount of brokenness and ignorance or greed. Many feel pressure in various degrees to contribute toward change. There are more or less 4 groups: **those who do their best to make sustainable choices wherever they can, those who consciously alter their consumption behaviour, those who are actively engaged in change making initiatives and those who devote their life's purpose to a sustainability** transition. Each of these groups held around 10 people. The global crisis informed the study choice for 8 people. Another such group describes what they see happening in the world but does not explicitly say how it affects their life.

The overall impression is that the students have a **high level of awareness and feeling of involvement in the crisis,** with serious anxiety for the future while struggling to be a young person with wishes to enjoy life, travel and have fun also. Many students express how they **struggle with making the right decisions**. Five students explicitly mention their doubt to have children. The question brings up many personal stories.

The students express that it gives them hope to see many people are trying to make a change, especially young people in Wageningen. **It also gives them hope to learn about alternatives.** The permaculture course is mentioned several times as a source of hope. One quote touched me: *'The lectures were mostly full of appreciation of agricultural elements and the many functions they can perform, has changed my attitude gradually a bit from being anxious towards being full of gratitude, inspired and I sometimes even feel moved by the things I learn".*

6.2 Overall experience of the course

How did you experience the course overall? What contributed to this experience?

From the total of 67 students, 60 students describe their experience as positive, ranging from **enjoyable/liked** it to **amazing/wonderful/excellent/best** course so far. A variety of things are mentioned that contributed to this experience, mostly the design exercise, the community learning, the ambition and passion of the teaching team/guest speakers/commissioners, the positivity and diversity in the course content and the diversity of teaching methods**.** Five students say they needed to get used to the course, due to the controversial lectures, the teaching methods or the teaching style from Kees.

From the remaining 8 students, 2 explicitly state they are quite **disappointed**. They mention that they hoped to get more lectures based on plant studies and how systems work, and then discuss with peers and commissioners what to do with it instead of hearing the opinionated perspectives from all the practitioners. One feels the teaching methods are not fitting, *"all those 'walk-out/observation exercises' are indeed interesting, but they don't seem to fit in a master level course".* One student says that he *"rather stays close to science, because science helps convince people that are 'relevant' to stop being idiots".* The other students mention that the online setting hampered them from enjoying the course or that it was too hectic and intense for them. For two students this was also related to personal circumstances.

About 12 other students who did enjoy the course mention that the **intensity of the course** was tough. This quote captures that: *"messy and intensive (due to lack of consistency and predictability) but interactive and inspiring (because of a variety of lectures, guests and practical exercises)".* The density of content is too big for four weeks, some say it could easily fill a 12-credit course. About 4 students mention that they were already overworked. It went by too fast, and some say they are sad that there was no time to take everything in properly. The working days from 9-5 are mentioned by some as heavy. One suggests putting lectures in the morning and design time in the afternoon throughout the whole course.

In contrast to this, about 10 students mention **the lack of pressure** in the course as positive and different from what is normally experienced in courses. Although the course was intense, the atmosphere was experienced as relaxed. One student says: *"I love the lack of pressure and the trust we were given by the teachers. I still had a steep learning curve because this way of teaching sparked my natural interest and the feeling of comfort was beneficial for my energy levels. Putting pressure can cause stress and takes away so much energy. So I think this approach is very effective and everyone is allowed to decide for themselves what they want to take from it and what they can give."* This observation was mentioned multiple times. However, another student mentions that *"the lack of pressure felt a bit weird sometimes, I think I became a bit lazy at some moments, but at the same time it allowed me to implement the lessons a bit more in my personal life".*

In describing the things that have contributed to the students' positive experience, most often mentioned is the **design exercise.** It was valued a lot that they could apply their knowledge in practice for a real person. About 20 students explicitly mention how the group work enlivened them, especially in times of corona. They built strong connections throughout the process and were happy to meet other passionate people. *"Meeting my course mates and seeing their ingenuity through their design has been incredibly inspiring.* About 6 students explicitly mention how inspiring their commissioner was to them. Students also mention the strength of learning by doing. One says: *"although I had a lot of courses about soil and atmosphere, I seemed to have forgotten at the moment we had to put it in practice."* In total 4 students explicitly disliked the group work. For one this was related to losing a sense of social safety in the course, for one this was due to a dominant group member, for one this was because the assignment was too restricted and group dynamics, and one mentioned no reason. Two students mentioned that the course objectives were different from the commissioner's expectations, which caused frustration. They missed supervision in this matter.

The community of learning in the overall course was mentioned by many students as well. They were deeply inspired by the passion and positivity of everyone involved in the course, teachers and students. They enjoyed the open setting with many discussions and the diversity of opinions. *"There was much more focus on our opinion and just a much healthier outlook on learning".* Many students experienced it as a community of friendship, which was very meaningful to them. *"It made me feel very at home and the overall atmosphere was relaxed, friendly, inviting and encouraging".* One student says that *"it was the first course where I actually wanted to put on my webcam and ask or answer questions because I felt comfortable".* One student mentions the mutual respect she felt in the course as valuable and motivating to learn. Many students mention the outdoor excursions as important moments of connecting to peers.

The ambition and passion of the teaching team is explicitly mentioned by 10 students. They appreciated how the content was presented in an open and critical way. *"I find of extreme importance the opportunity I had to interact and get to know people who have dedicated their lives to permaculture principles, love for nature and for each other". "The teaching team really brought the content to life."* Appreciation was also expressed for the original solutions sought in relation to covid constraints.

The feeling of positivity and inspiration was also experienced in **the course content.** The lectures, guest speakers and excursions are all mentioned often. Overall the diversity of approaches and perspectives on permaculture throughout the course represented by different people was much appreciated, in combination with the space to discuss. This process of questioning and continuously adding new sides to the story captivated many students. The overall topics were considered interesting and many students indicate that they learned a lot, some say more than in merely theoretical courses. One student says that *"permaculture should not only be about looking outwards as if someone else has all the answers, but also about looking inwards to see which answers you may already carry around by yourself".* About 5 students mention that they missed some technical knowledge. One student felt unprepared for the design assignment. The others just would have liked to see more of it. More material to read and structured theory, a lecture about soil, or detailed information about permaculture history, philosophy and practices. One student who did not enjoy the course was frustrated with the contradicting opinions of guest practitioners and would have wanted factual information.

The teaching methods are also mentioned a lot as a main contributor to the course. The diversity of methods, including lecture, excursions, guest speakers, morning exercises, journaling, reflection and the design exercise really cover a full range of knowledge, experience, practical application and personal growth. Many students explicitly refer to the head, heart and hands philosophy as a nice approach to teaching and learning. Some students experienced it as a *'fresh breeze'* in their otherwise strictly scientific education. Some state that they appreciate that non-scientific knowledge is taken seriously. Others refer more to the freedom and creativity they experienced. One student mentioned that *"I do not follow courses like this all the time, because sometimes it was a little vague."* Two other students mention 'vague' and 'uncoordinated' as criticisms. Two students explicitly refer to the word spirituality as positive, it felt holistic and they found the science/spirituality mix interesting.

The **morning exercises and journal exercises** are mentioned explicitly by 10 students. Overall they appreciated it as a reminder to connect with nature and a method for personal growth and reflection. One student is continuing it after the course, and one says that "*the attention to intuition and observation were outstanding to me, I wish for all students outside the course to learn these lessons".* Two students mention that they found too much focus on intuition or spirituality in the course.

Many students describe what the course did for them in terms of **personal growth.** These takeaways can more or less be divided into groups of **hope** and positive feeling, changed **mindset** and new **career perspectives.**

"very positive and eye-opening course"
"it gave me hope for a better future"
"added a lot of value to my life, not only in knowledge, community, music (song), self-reflection"

"brought a lot of knowledge, opened my heart, head and mind"
"learned a way of thinking"
"this course really changed my perspective on a lot of things and at the start it was really quite terrifying as a lot of my beliefs were challenged (but I am actually really happy about that!)"
"I gained a lot of life philosophy"

"The course added something to my personal baggage, not just knowledge. This course gives value to the people, to personal opinions and personal growth".
"I discovered myself through the course, learning by experiencing my surroundings instead of cramming knowledge for an exam"
"increased my level of self-confidence in terms of feeling capable to implementing a design in the future"

"after this course, i feel more certain of my future at WUR and am in fact quite keen on starting my internship and thesis while keeping permaculture principles in my mind"
"take the practical knowledge in my career and the philosophy as well"
"I am grateful for the drive this course has given me to make an impact through agriculture"
"it reconnected me to the initial motivation to start MOA"

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"These people have strongly inspired me to try to understand what motivates me and to decide to take risks in the life choices that I consider important and suitable for me. For example, I would love to be a part of a CSA and seeing two young women who have made it successfully, despite challenges, encourages me."

"Now I can see myself research and keep working towards this direction"
"I will not stop sharing permaculture principles, and always give something back to people and nature"

6.3 Inspiration

Did you experience the way of learning in the course to be inspiring? If so, can you give some examples of course elements that inspired or did not inspire you and why?

Many students indicate that they found the whole course to be inspiring, however most students do indicate specific course elements and examples. The most often mentioned element was the **design project**. Students enjoyed working on a real case in which they could make a contribution to society and help their commissioner achieve their dreams. They express a big relief in **finally doing something practical and real** as opposed to merely theoretical and explicitly mention the value of combining theory and practice. It inspired them because they experienced through the process that

there are possibilities to take care of people, the earth and share fairly. To enhance biodiversity and create socially inclusive systems. They also enjoyed the feeling of **responsibility** and this motivated their **intrinsic wish to learn** more and study more seriously after the course in order to make a contribution to the world. They also enjoyed the **freedom** of the exercise, which in contrast to usual restrictive guidelines gave them a chance to dream and open their mind. It was important for them to be able to brainstorm, problem-solve and create their own ideas. They were inspired by the **many different designs** and types of commissioners, representing many different pathways to sustainable food systems. Some mention how they were touched by the interaction with their commissioner, because they were real people with real dreams trying to apply it in complex reality.

The second most often cited course element was the literature from **Braiding Sweetgrass.** Students felt inspired by the author's spirituality as situated in nature, and specifically in these chapters, food. Through reading it, students felt they could connect to their own spirituality, intuition and natural instincts. They also gained insight in our societal relation to nature and different ways of living in nature. Some students indicated that they had missed time to discuss with others. One student would have liked to learn more about indigenous 'permaculture' systems.

The third most often cited course elements were **the excursions and many guest speaker sessions.** Although they had taken place online, the students enjoyed **seeing a diversity of systems** and **hearing the stories** of these pioneers. Their interest was triggered by the different ways of organising the farm and connecting to the community. They were caught by the combination of **wild ideas** and **practical constraints** in the farms. One student mentioned how she was touched by a farmer's remark that he is content with not understanding his system, that it takes care of itself. It gave a sense of **trust in nature**. Another student mentioned how the fact that these were external people really helped to engage her, because a lecturer to her has become a person that you just repeat but who does not actually say interesting things. The **working afternoon on the farm** is explicitly mentioned by many students as inspiring. Talking with the farmer, relating and discussing with other students as well as mixing of head and hands were mentioned as valuable. They found it daring to include an excursion with no particular intellectual aim in the university.

The overall way of teaching and **the holistic way of thinking** was mentioned a lot as being inspiring. The students appreciated the head, heart and hands integration in the course especially in an academic context. They understood how this is part of a transition to sustainability. One nice quote exemplifies this point: *"Many of the issues that permaculture tackles prevail in the way science is being done, treating students like abstract knowledge-absorbers instead of co-creators that experience feelings with the subject matter and can bring it back on a level that is meaningful for one's personal life and body".* It helped them to learn and they felt the value of observing, going out, using intuition. It allowed students to be creative and think deeper. *"It made me feel smarter because I was listening with different parts of my brain than just the critical one, as well as different parts of my body and overall perception abilities."* Some students explicitly mention the examinations as inspiring, because they are reflective and engaging by linking concepts. Many students mention how grateful they are for being treated as an equal, that their perspectives are appreciated and that their experience is central to learning. One student indicates that: *"University is meant to make you a critical person, but this is one of the first courses that actually did challenge me".* Some students experienced the way of learning as spacious, giving time to slow down and

reflect. Just sitting and observing meant a lot to them and gave important insights. It helped them to connect to their intuition and their environment. One student mentioned she learned how to be silent and listen to nature and people. The spiritual aspect is considered quite revolutionary in academia. One student states that she finds the spiritual important but is afraid that permaculture loses credibility because of it. Some individuals experienced it as overwhelming and too busy to address the learnings properly. Some students missed time in the schedule for doing the home assignments.

The **teaching team** played an important role for many students. The energy and passion of the team, as well as kindness are often mentioned. The mingling of science and non-science was interesting to them. They experienced the willingness to really debate and discuss, also being critical of permaculture as very valuable. Some of the stories of Kees are explicitly mentioned as inspiring. Again, the students mention that *"many courses make you feel almost like a product, a number that needs to be pumped full of knowledge. In this course I actually felt like me and my teachers were equals and I was treated as a human person."*

Similarly, **the conversations with classmates** are often mentioned. Although a number of students indicated that they actually missed such interactions due to the online setting, many students found it in parts of the course such as the design discussions, the farm work and during some lectures. They appreciated the community feeling in the course, a sense of like-mindedness but also a large diversity of ideas and opinions. One girl noted how it inspired her that we would "just listen to other people's opinions, without answering them".

The **home assignments and morning exercises** are also mentioned often. They supported creativity, open-mindedness and a way to connect learnings to one's personal life. The students valued the morning exercises, because they learned from observation and could connect their learnings to the living world. They felt space to slow down, take time for themselves and felt a relief from pressure that is crucial for learning. Some indicate that they could connect mind and heart through the exercises. The most often cited home assignment was Braiding Sweetgrass, but also the other assignments were appreciated. Not all students found time to do all three assignments. The assignment of following a plant throughout the course was very inspiring for some students. It opened their mind to the life of a plant and its connections to the surroundings. It raised a lot of questions. The exercise of putting oneself in the position of another being is only mentioned once.

The **sense of place exercise** was also regularly cited as inspiring, they enjoyed the meditation in class and experienced the importance of place attachment. One student indicated that she would have rather spent her time otherwise.

A handful of students specifically mention **content of the course**, such as permaculture principles of multifunctionality of elements, relative location, intrinsic characteristics of elements, or opportunities to work with perennial species, or the concept of the guild. The topic of working with animals in permaculture is also mentioned several times.

The **skills workshops** were also mentioned once as a useful way of offering knowledge in comparison to yet more theory.

The **Genius Loci** lecture was considered not so inspiring by two people, one who felt it was not important and another who did not understand the message.

One student criticised **the bike excursion**, which could have been organised better by connecting the questions to a discussion/feedback session. And one disliked the **Eco literacy lecture**, which felt redundant. Some students express their frustration with online learning.

6.4 Different ways of knowing

In this course learning was not approached as a pure cognitive process, but for a large part also as an embodied, experiential and intuitive process. Do you feel that through this diversity of approaches you experienced that you can 'know' and learn things in different ways? If so, could you explain how some course elements made learn/know in a different way and how that affected you?

The vast majority of the students express a positive response to this question, however in different ways. Some explicitly affirm the question and continue to describe elements, others describe more generally how the learning approaches in the course are valuable. Many students find this course an important addition to their program. One student summarises well what is reflected in the overall responses: *"I'm used to learn data, concepts, definitions. Here I learned how to develop a personal opinion, how to design a place does not have specific rules, that it is important to listen and observer people, landscape and imagine."*

The students affirm in different ways that they have experienced 'knowing' in a new or different way than usual. Many students compared the effects of this course to more theoretical ones, and that through applying concepts in a diversity of practices **their learning was deeper and more effective** than in purely theoretical courses. It was **easier to remember the content** from the course and some concepts were understood much better through the combination of lectures, observation and intuition. Some students express that it feels more **natural** to learn this way**,** *"it complies better with who we are."* Several students also affirm that this way of learning feels more **meaningful** in a life context, "it is *more than just getting an answer right, it's understanding, learning, trying, experiencing".* About 10 students affirm that for them **true understanding only comes from practical and real-life experience**. Many students express that through the diversity of approaches, they felt **more connected to the material** and could learn more easily. It increased motivation to learn, as they felt more directly involved and the activities felt closer to life. Three people explicitly refer to an emotional connection to the topic and people in the course.

From the answers it appears that this course triggers many students to **reflect on knowledge and their relation to it**. They reflect on the experience that theoretical knowledge is problematic in practice**:** *"A lot of it is **situated knowledge** and some things can only be learnt by experiencing it in reality".* Many students affirm that **personal experience** is very important for knowing: *"To really learn something I need to experience it myself"*. One student mentions that the engagement with a farm was important because *'it's easy to become detached from farmers and forget they are real people with real needs and problems".* One student expresses that it is soothing to *'embrace **the fact that you just don't know everything** and you probably never will'*, and inspiring that many farmers

can give into this. Another student also recognises an **appreciation for complexity:** *"It made me realise that what you read in a book is always different from reality. Every place is different and every place is different in time, this is where intuition and experiments really come into play".* The overall responses from the students reflect that they understand the **function of intuition** as a source of knowledge when facing complexity and the unknown. *"In our design we frequently had to think of stuff we could not find online, we had to use our intuition".* This gives intuition a valid place in academia. Several students note that this course made clear to them that *'it is important to be able to distinguish scientifically proven facts & opinion or intuition, without discrediting personal experience and observation".* Another says, *"intuition cannot replace cognitive processes of researching and learning, but an intuitive self can help to focus on nature in a way that guides us through conscious and effective learning".* One of them expresses some caution that **intuition should be treated critically,** just like science, as it can also lead to false ideas when left unquestioned.

Other students relate more to a change in how they **experience the environment**. Many students felt that through the diversity of approaches they could **explore new ways of being and observing.** *"For example, now I observe my environment in a different way. More holistic and looking at links between elements".* One student explains that it *"helped me to be more aware of my surroundings, effects of my actions on this world and use more my intuition."* One person describes an *"awakened sensitivity towards the living world, although I can feel how deeply conditioned, I am to the usual cognitive and theoretical way of learning".* Another student describes how it *"helped to develop more sensed awareness of what makes plants/cows/etc. happier and healthier".*

Other students relate more to aspects of **personal empowerment**. Several students state that they feel more confident after the course in general or specifically to use their **intuition or personal insight as a valid form of knowledge**. *"This course gave you the opportunity to think for yourself while providing a foundation on which to base these thoughts."* Another person says that **it gives strength**, *'it is more something of my own, not just a fact'*. One student says, *"I recovered my ability to think, which was lost due to years of cramming education".* Several students indicate that this way of learning or being in the world was not new to them, but they enjoyed that there was finally a course in which they could **combine both their intuitive and scientific interest**. One student says she always felt alone in this and found great support in a university teacher who actively encourages other ways of knowing. Several students say they feel more prepared for a job after this course. One student mentions that it is **important to include different ways of learning,** because different people have different learning styles. This course is in that sense more inclusive to different people, but also to different ways of learning within one person.

About 7 students express that they could not work with the intuitive/embodied approaches, one simply states it **did not work for her**, one would have like a **more cognitive approach**, one felt that due to **study pressure** in previous years she could not open up to the approaches and 4 express that this was related to the **online learning environment**. There were 3 students who say they are already used to embodied approaches due to their upbringing or life on the farm, therefore it did not affect them much, but they appreciated the approaches as part of a university course. A few students indicated that they needed to get used to the approaches. *"At first I didn't get the heart part - but throughout the course I noticed my perspectives had changed by meeting people, seeing*

different places, trying out new things, your heart can change and open up to new possibilities". One student explains that embodiment, experience and intuition can be **deeply personal,** therefore she felt resistance at first but opened up throughout the course.

Many students mention **the design project** as an important course element in which they experience another way of knowing. Quite a few students tell how they had made nice plans on paper which turned out unfitting when visiting their site. *"It struck me how some ideas make sense in maps, tables and figures but not while looking at the land".* They also mention that **embodied way of knowing their site** was important for the design. "*Physically going to the design site, learning about the organisms that live there, walk where you want to change, feel how it will and feel the spacing".* One student stresses the social learning aspect as '*the collective knowing with the bodies and minds of her group being re-enacted in the design process".* In one group, the **Genius Loci concept played** an important role in the design, their commissioner really wanted them to find it and feel the right places for paths and meeting points. This created a lot of space to discover intuition as a meaningful source of knowledge. The design assignment also stimulated personal empowerment for several students. They express more **confidence in knowing and doing** after the assignment. "*I do not need to know everything to make a good design, I knew more than I thought, and if I do not know I can do some research and find it."* Responsibility is also mentioned as empowering.

About 20 students mention **the outdoor excursions** (bike tour and farm work) as moments where they experienced a different way of knowing. Many do not specify how each of the two contributed, but several students do. Working on the land and talking with the farmer mostly let the students **experience labour,** working in the full sun and doing repetitive work, brought them a different way of 'knowing' farming. Some students mention it brought a more realistic image than the popular idealistic one. One student experienced that farming feels natural to do, as intrinsic human behaviour. The bike tour brought a more **sensed understanding of landscape dynamics** and triggered students to observe relationships between elements. One person says '*being on a field observing, touching, seeing and experiencing the landscape'* made it different from just hearing about it in a lecture. One student mentioned the visual soil analysis: *"I read many descriptions of soils, but now I know what the smell, taste, texture is like".*

The reflection assignments and morning/observation exercises are mentioned by around 20 students as important elements to explore different ways of knowing. Many students do not clearly distinguish the morning exercises from the assignments. **The practice of observation** was mentioned most, '*being somewhere, looking around and questioning other things than usually'.* One student was touched '*to observe nature with inquiring eyes'.* For one student, the morning exercises really became a practice to be continued after the course. It also helped to become aware of **personal growth** throughout the course: *"Coming back to the garden allowed me to get feedback on my process, way of thinking and how it's changed".* Overall, several students say that the observation exercises in the course brought **new ways of experiencing the world/surroundings**. *"It shaped my perception of the systems that surrounded me and gave me tools to see things differently".* The permaculture principles also played a role here.

Several students specify that reading **Braiding Sweetgrass** brought a new way to experience the surroundings/the world. One student tells how the different way of knowing the world as expressed

through the verb rich language of Potawatomi really struck her and formed a basis for understanding all other activities in the course. She has started to view the world as a gift through a lens of **gratitude.** Several students were intrigued by indigenous perspectives and are curious to learn more. Several students mention that **observing a plant everyday** was special to them. *"Observing a plant everyday made me more aware of the interconnectedness of living things".* One student mentions that she tried to listen to the plant but it didn't work. For one student the **exercise of being another organism** helped her to experience knowing more inside her body. Also the **sense of place** exercise helped her with this. The genius loci/sense of place exercise is mentioned by 5 other students too.

A group of about 15 students refers more generally to the **head, heart and hands** approach as bringing them different ways of knowing. By taking this approach into the design process, they felt it was easier to *'assemble conceptual, material and strategic components.* Also **bringing practice to the class** was helpful to create different ways of knowing the theory, especially because exemplar cases were presented along with the theory of the day. Also **the exams** are mentioned 3 times as contributors to a different way of knowing. *"It wasn't just knowing things by head but about system thinking and connecting things, reflecting on yourself"* and it gave one student *"self-confidence in my own reflection and intuition".*

6.5 Course community

In this course we tried to create an open, safe learning environment with a diversity of perspectives and room to formulate your own vision. How did you experience the learning community in this course? Please also elaborate on how you felt in relation to teachers, assistants and other students.

The vast majority of students found the learning community to be **open and/or free/welcoming/comfortable/safe**. About 10 students reacted with less than outwardly positive responses, 2 were explicitly critical. Overall, the students felt that the open atmosphere created by the teaching staff **encouraged learning, discussion and criticism**. There was space for expressing opinion, for funny and serious moments and some felt free to share ignorance. *"The open environment to be able to listen to other lecturers, guests and students made me always increase understanding I had about something and be able to understand it fully and embody it".* Many students mention they felt a **strong community of diverse and passionate people.** *"Finally finding peers, people who care about nature. Wish we could stay in touch".* The **introduction session** on the first day is mentioned by several students as an important moment to connect. One student notes that this was nice, but also a danger because of becoming a bubble. One person finds that permaculture was idealised.

Students felt **valued** as a person and **respected** in their views and questions. *"I could ask many questions, nothing would be wrong or right"*. One says, *"everyone is important".* This sense of **equality** and **respect** is mentioned by many students. *'There were disagreements (e.g. inclusion of animals or viability of food forests) but there was a sense of respect that elevated the discussion".* Many students mention the efforts of the teaching team to create this atmosphere, and mention that they found the teachers kind, approachable, enthusiastic, knowledgeable, helpful and patient. Some students say this is general at WUR, but extra in this course. Several students mention how

important this was for their learning: *"Instead of generating pressure, they have stimulated us from the beginning to think outside the box and share even the most extravagant ideas"*. However, three students mention that two guest teachers came across as condescending or dominating during the last reflection moment.

Many students mention that they enjoyed sharing and **learning with peers** the most. The open atmosphere in the course facilitated this and the different study backgrounds. They mention how the activity in the zoom chat, discussions in the group work, during the live excursions and after lectures contributed to a lively learning environment. *"Nice to feel free to say weird things in my group or say philosophical/spiritual things and have people respond positively"*. Some students share how they are genuinely touched by the **generosity** of both peers and teaching team, to help and support each other, share knowledge and fun things. Several students mention the course WhatsApp group where people actively shared articles, knowledge and adventures.

Many students refer to the **diversity of viewpoints** that are presented in the course in a positive way. Many felt that through this they could sharpen their mind and feel what their own position would be. *"It made it so that you did not get the right answers but that you got many answers of which you had to decide which one was right for you"*. Many students appreciated the **honesty and humbleness** of this approach, as it is close to reality: *"I loved that they contradicted each other, because that is a very fitting representation of reality and of the complexity of the matter. I liked how people noticed and praised this as opposed to wanting a clear solution to solve all problems"*. One student suggested improving this by inviting a conventional farmer.

The students also had some criticism of the learning community. Some felt that the environment was too free, they missed clear instructions in some cases or got confused by the fact there was no right answer. Several students indicated that due to the variety of (controversial) perspectives, it would have been better to include more time for discussion.

About 10 students felt that due to the **online learning environment** they did not experience the learning community as much. Many of them followed the course fully online. There was not much space for free interaction in the breaks, and space for discussion after lectures was limited. One student suggests including a forum in the course for further discussion. However, the zoom chat was used well these students say, the teachers were always available. It was more difficult to get to know people, which for one student was an obstacle to share personal things in the exercise of sense of place. However, another student actually felt connectedness during this particular break out session and cried. One student felt socially excluded because she could not join the live excursions, but also understood the situation.

Some students experienced some **unsafety in the group work.** One student thought the commissioners were part of the grading process and felt this unsafe. This student also experienced the **expectations too high,** which led to stressful confrontations in the group. A few students expressed that they **needed more guidance** during the design. And one person says their group got too much involvement because their assignment concerned the food forest run by the teaching team. This hampered their creativity. Two students suffered some **usual group dynamic challenges**. Some students who did enjoy the group work also noted that it was **intense.**

Did you experience internal conflict (friction, resistance) with viewpoints or methods in the course (maybe compared to what you're used to)? If so, can you give some examples of course elements that elicited such conflict within yourself and could you try to explain why this resistance was there and how you dealt with that?

This question elicited a variety of responses from the students. 14 students indicated that they experienced no friction or conflicts. For 5 students, 'normal' university courses were experienced as more conflicting with their views or ways of learning.

Friction with the **spiritual aspects of the course** is mentioned 9 times. Two students mention specifically the **Genius Loci lecture**, which was not clear. One student found a way to understand it later and another student says, "*I don't really want to connect to a spirit in nature but with nature itself, and I don't think I need to connect with spirit in order to connect with nature.*" This was also related to a Christian background. One person felt uncomfortable sharing her experiences of **the meditation exercise.** Three students say they **feel no connection to the proposed spirituality**, it is not clear from the answers whether the students refer to particular exercises or two the personal philosophy of Kees the teacher. One of them feels like "*I was being induced to experience something I wasn't experiencing on my own accord*" and one says, "*Attributing all this value to a certain spiritual belonging might result in an over simplistic understanding of the world*". This student did enjoy exercises as physical contact and observation of elements in nature. One person feels that the course proposed a **one-sided view of spirituality** - just feeling - while it is the combination of feeling, knowledge and practical experience to her. One student felt a bit challenged but found it a good change of perspective in the end. One student just would have preferred more space for technical information.

The morning exercises and home assignments only elicited some practical resistance, being in the morning, or not being discussed in class enough.

The feeling that the course was **'unscientific'** was mentioned 7 times, however all these students **appreciated other perspectives on knowing and learning after the course.** "*Later I noticed that I was a little indoctrinated with scientific education, it opened my eyes that current education has many flaws. there is much more to learn and being in touch with your feelings and trying to force yourself to take a different perspective is incredibly valuable*". And "*I still have some trouble accepting that sometimes your head does not have to be in charge of a decision, but now at least see the value of the other two (heart and hands)*". One student found it an interesting challenge that the whole course is in conflict with the university system.

Four students experience friction with viewpoints from their **earlier study background.** One was related to **multi species planting** in permaculture, one came from **quantitative approaches** to sustainability and one says that "*especially my ideas on annual vegetables and **traditional European***

diet was challenged. *The course taught me that there is value in looking at traditional and modern knowledge and practices".* A student from horticulture experienced a value conflict with industrial approaches but says *"it has given me deeper insight into what I want to get out of my career and life, and I think that **more futuristic styles of farming** still have a niche place in the future of farming but having people that have broad perspectives on topics such as regenerative agriculture is key to create and use such systems in a way that benefits society".* An anthropology student notes a **dichotomy between science/indigenous** and assigning mystical, exotic and supernatural to indigenous as a homogenous group, denying a variety of cultures and histories.

Five students **missed specific knowledge** in the course, specifically about business models for permaculture, the use of Qgis, the contrast between intensive and non-intervention systems, and clear history and definition of permaculture. These latter two topics could have been discussed more also. One student indicates the knowledge in the course is general and overlaps with the farm experience internship.

Four students note a **bias in the course towards permaculture as the 'right' system.** Two students mention the guest lecture by Wouter van Eck as the main element: *"reducing non-permaculture practices to people's ignorance misses the whole historical and cultural context of farming."* One student found other students too idealistic: **"***Even though I believe permaculture has great opportunities, I do think we need to be realistic about the scale and time in which our society can change".* One student was annoyed by *"the united force against capitalism".*

The topic of **animals in permaculture** elicited conflict for 5 students. Three of these had trouble with the proposition to use animals for meat production for ethical reasons. Two students felt resistance to the opposite view that animals have no place in food production.
Two students mention how the story of a dying cow elicited a lot of frustration because it is *"a dangerous example of how people can confuse intuition for false ideas of connection. People should be aware that animals do not perceive people the same as they do them"*

The design case or **interaction with the commissioner** brought some frustration for 7 students, because the commissioner was too spiritual, too business minded, did not actually own the land for the design or there was some other conflict in the process. One student just felt insecure to do this task but was glad she did.

A list of other points of resistance is mentioned: that the course was a leap into the unknown, that there was some chaos, that the course was intense, a tense moment during a panel discussion, that Bill Mollison is considered the founder of pc rather than indigenous peoples and some specific opinions from students/lecturers/guest speakers that did not come across well.

6.7 Sensitivity

Do you experience that your sensitivity to the world around you has changed? Could you describe which course elements affected your sensitivity and how?

About 45 students indicate that they noted a change in sensitivity, mostly in relation to their environment but also other aspects. The elements that contributed to this are very diverse, but the main ones are the **permaculture principles and concepts, the observation exercises and the design work.** Around 10 students indicate there was no change for them. For 7 students, the course supported/legitimised/increased their existing sensitivity. Others are not sure or give mixed answers. This story nicely summarises a combination of answers from the students: "*My small terrace in my apartment was riddled with a bundle of baby garden spiders. I decided to observe these spiders over time and tried to create small climbing walls using sticks for my vetch plants in my pots. I noticed how the spiders slowly migrated towards them over time (while some simply moved elsewhere), and made webs wherever they could find an opening between different branches. These spiders now feed on the aphids which are starting to disturb my plants (I also feed them some insects if I find them). I enjoy watching them fulfil their role while at the same time providing a benefit for myself (by catching mosquitoes), and to my plants.*

Many students mention that they have become more **observant or sensitive towards the environment/the world around.** For many students, this is firstly related to **plants** and some include also animals. They focus more on trees and plants when walking outside. Some focus more on **sensation**, others on **species** or on the **inter-relationships of plants** and the dynamics of natural communities. *"I hear most birds and see most plants, now it was the first time I tried to really capture the smell of surroundings".* Exercises where one had to look for relations and reflect on experiences and observations played a major role. The **concept of the guild** (a plant community) has played a major role for many students as a tool for observing their environment and seeking how elements are related. *"I'm looking more at systems and their relations".* Also the concept that every species has **intrinsic characteristics** which play a role in the system is often mentioned *"Biking along paths I'm now trying to identify every tree/plant and imagine the intrinsic characteristics".*

Several students describe how the **permaculture principles** have altered their experience of the environment *"the principles gave me a kind of structure in what ways I can experience and observe the world around me, and I started to recognise possibilities for principles even in my urban area".* Some students say they see principles everywhere now *"looking at things with principles in mind, seeing edges and guilds everywhere when going for a walk".* About 15 students indicate that they **habitually observe their environment** now when moving around. "*I get distracted by plants and animals when I walk with friends".* Some students continuously see possibilities for implementation of principles. One person went by bike to the design site, *"constantly analysing the landscape around me, recognised design principles and lack thereof, triggered me to change something."*

Several students describe **a changed relationship to the world** due to a mix of course elements**:** "I *know more species, which makes the world more alive"* or *"I feel more connected to the landscapes and its life"* or *"I imagine what it would be like to be a tree in the forest when I walk there"* and *"I am more sensitive about each living organism, that is has its intrinsic behaviour and function within an ecosystem, should be treated with respect".*

"I started to look differently at the plant, being curious to how they behave and feeling more responsible for watering and taking care of them. I realise how much they are alive. I also want to go into the field more and just look at all the vetch, buttercups and other plants"

"I learned which weeds I can eat, scanning for edible plants makes me notice more the development of different species. Since eating the plants from my surroundings I feel so connected, on a metaphysical level even. They energise me in a way vegetables don't. I can't explain that, but I love it. I can now smell the plants in the air! And I noticed a distinctive bird sound, when looking it turned out to be owl babies! Now I stopped walking my dog there because I saw owl mom hunting. All that because of this course"

*With my academic background not being about our natural environment at all, everything was new and magical to me. The guilds, for me, emphasise that interactions in nature are about cooperation with one another to create a resilient and thriving community, which moves me sometimes when I think about it, as it suggests that **nature is designed to be cooperative.** I experience the world much more as a whole after than I did before this course".*

For 7 students, the course **just increased existing sensitivity towards the environment**. Some report a changed understanding of plants and trees, or experience that they could train and enhance inner ability to observe details in nature *"detail with which I observe nature around me has improved, identify more plants, what species tell about soil, looking for guilds, closer attention to animals, characteristics, needs, behaviours. It makes me feel more at home in the Netherlands".*

Several students describe a change **in relationship to other things.** For some it changed the way they look at farming *'regenerative is feasible and the importance to share the land with different species".* Two students describe feeling sad when seeing monocultures. Two describe a change in relationship to food, one now leaves weeds growing in the veg garden, one became more sensitive toward animals. Some others say: *"the course gave me an extra chance to slow down, think and see more things."* One person felt that *"By inserting spirituality into the academic world I felt fulfilled. Kind of having a right to feeling things in this way again, a part of the whole, after years of separation between different compartments. Now I can say: I have the right to feel like this, no matter what".* Some specific moments in the course were impactful for some, like Kees saying that things have value just by existing, the guest speakers sensitising the context of permaculture, the lecture on soil or the interaction with a goat farmer and his affection for animals.

The **home assignments** are mentioned 13 times as elements that fostered sensitivity, especially the **exercise of watching a plant over a longer time**. *"Making time to look, describe and being excited to come back and see what changed"* and *"there are all the time things going around me which easily go unnoticed".* The chapters of **Braiding Sweetgrass** are mentioned 7 times. These students describe being more aware of different ways of being/interpreting life. *"Whole new appreciation for mother earth"* and *"It really made me think about many things that I took for granted, actions that I underestimated and to which I now give greater weight and sensitivity. Often when I do grocery now I think about the honourable harvest".* For one person the language of elements as movement or being was impactful: *"I talk with all of nature now, not only trees and animals, but also with the dike and the wind".* One student mentions the assignment of **taking another being's perspective** *"I naturally get into an animal perspective now".*

The **morning exercises** were mentioned by 8 students. Most describe being **more sensitive to seeing vegetation** as they move through the world. Some reactions are "*I have been noticing little things out in nature more and appreciating them for just existing*" and "*I want to know each being, what do others call you, how you smell, when you bloom, where you like to live, if I can eat a bit of you*". **The Genius Loci/sense of place exercise** is mentioned 2 times, for one person this was "*enlightening*" and suggests that university should focus on the rational and spiritual side of the brain.

Seven students say that mainly the **design work** changed their sensitivity in a variety of ways. Selecting species increased relationship to the world, for another it was more the creativity and imagination concerning landscape management. Others had more positivism towards the future, or got intrigued by social permaculture in the diversity of roles within the teamwork, one reflected on how to manage sensitivity in relation to others.

For 10 students there was no change, 8 of them indicated that they were already very sensitive to the environment. Others mention obstacles like covid, the speed of the course or that change needs time. Other sensitivities are mentioned though: "*More space in my head again to think about the future and to explore possibilities. I remembered what I want to do in life*" or '*Light in Kees' eyes and other teachers made me feel really good*".

6.8 Interconnectedness

Permaculture is strongly rooted in a perspective on life that emphasises interconnectedness. Were there any elements in the course that affected your perception of yourself and/or humanity in relation to the rest of the world? Could you explain what elements in the course (if any) contributed to this?

In answer to this question, 8 students indicated that nothing has changed for them. For 10 students, the course had reinforced existing worldviews of connectedness. The other students gave a variety of responses.

A group of 13 students refers to the impact of reading **Braiding Sweetgrass** in their relationship to the world. It stimulated students to **practise reciprocity or kindness** to other organisms more in daily life, one adopted the principles of Honourable harvest. They felt reminded of their **responsibilities** to other beings. They were touched by stories, and some were intrigued by getting to know indigenous cosmologies as examples of living in interconnectedness. I found this a notable quotation: "*it has touched me very deeply and gave me chills. It explicates in words a feeling that was rooted inside. The Christian story on Adam and Eve and the guilt surrounding human existence on the planet seems to be a story that is engrained more deeply in our culture than I was aware of, and the book made me even more aware of that. The alternative story of the falling woman is very powerful and hopeful and has made me reconsider some of my deepest conceptions about the world; how much do I see human presence in relation to the story of Adam and Eve? Do I see humans as the cancer on this planet or as stewards of nature?*" One student also became more aware of how disconnected society is.

The **content part** of the course played an important role for several students. *"The lectures made me even more realise that we are part of nature and an ecosystem"*. Several students were already familiar with a **worldview of interconnectedness** but found **tools** in this course to work with it. *"I started looking for relations between various elements and how they benefit each other or interact with each other. I saw many possibilities of promoting these interconnections."*. Two students were struck by the lecture on global nutrient cycles and the original role of migrating animals, (including humans). One other student was struck by the role of animals in the whole. For some other students, the diversity of perspective in the course contributed to a view on human society as an ecosystem, where diversity is important. *"When we perceive society as an ecological community, we should strive for diversity of people to create resilience and to coexist instead of compete with one another. This new perspective is an example that we can learn so much from plants, animals, and the soil and that there is so much more to investigate. This way of thinking has only expanded during this course, as the focus on permaculture has given me tools to experiment with looking at society even more as a 'guild'. This generates a radically different idea of humanity."*

For many students, it was the whole course that made some change for them. This change related to different aspects. One student realised that humans play an *"important role in the world and an important power that we need to use in the right way. The relation that I feel is respect for each element, for each type of knowledge and for feelings''*. Seven other students gained a more positive view of humanity, as being part of the solution rather than just the problem. Especially the examples of the farmers in the course contributed to this, and the design case. For some students it has helped to see how things could be when the view of interconnectedness would be applied. Some students reflected on agriculture as human-nature interaction. One student felt after the course that not every person involved in agriculture should have as a main goal the one to feed as many people as possible. Another says *"it became evident that humans have a primal desire to work with their hands and amongst nature and people. When these things work in harmony (e.g. you only take from the land what is available, and try not to overindulge, but always return something so that you may have the same, if not better in the future), the heart automatically finds itself cradled by sense of agency and well-being."*

The more **sensory/experiential exercises** in the course were also mentioned. Most mentioned are the morning exercises as a tool for feeling/creating a sense of interconnectedness. *"I managed to embody my surroundings and felt strong ties between myself and the surroundings"*. The outdoor excursions and sense of place exercise are mentioned 2 times, the journal assignments (other than Braiding sweetgrass) 4 times. *"I feel more connected to the plants and other living things surrounding me."* Hearing other people's experiences of connection had an impact, also the practice of observation, feeling and experiencing. The reflection in class was important for sharing and solidifying ideas.

The movie **My Biggest little farm** that we watched in the course has changed the perspective of 4 students. *"I realised a farm could be connected with the rest of the world, not only by providing food for our society, but also by offering habitat and food for other species like insects and birds"*.

The **design exercise** also fostered a sense of connectedness, but in different ways. One describes that *"We wanted to bring more diversity to the garden of our clients so we had to think of ways to*

attract native insects and other animals like owls, rabbits and martens. I felt connected to these animals and it helped me look for ways to help them out, so that they can in the future help the clients out as well.". Another describes the social connectedness *"No longer was I one of the few with an interest in living in harmony with nature, but there were others".* And for another it was finding the genius loci *"Our commissioner challenged us to find the connection with the genius loci of the site. I closed my eyes and had my face in the sun in the morning after we had camped there. Suddenly I heard a million sounds of which I hadn't been aware the 2 other days we had been there".*

6.9 Values and ethics

Permaculture also contains a strong ethic of earth care, people care and fair share. Were you stimulated to consider your personal values and ethics throughout this course? If (not) so, could you explain which course elements stimulated this and how?

About 36 students indicated that the course did stimulate them to investigate/change their values. About 20 students say that the course reinforced or confirmed their values, and 9 students feel that they missed something in the course related to values or ran into a value conflict.

For many students, the course offered a **set of tools** to actually implement the values of care. The **discussion session with farmers** and **the design work** were important elements that highlighted the complexity of combining earth care, people care and fair share in reality, sometimes resulting in conflicting choices. The design work and interaction with the commissioner stimulated students to reflect on their ethics/values and how to apply them. The combination of all elements in the course offered a base to work with the values and fine-tune them.

For many students the course was a boost to **take values of care more seriously** and apply them more in life or reflect more on their personal role in relation to sustainability. All course elements contributed to this. Two students mention how they share more with others due to the course. Some became aware of how important their role as consumer is, and made changes in their choices. *'The lecture in which different farmers were talking about possible solutions to achieve these ethics, especially on the economic side, made me reflect much about the difficulties that small scale farming and permaculture will have to face to establish as a feasible alternative in our farming systems. What comes out is that much is up to the consumer to acknowledge the virtuosity of certain farming and to support them. As a consumer, I felt very much a responsibility in this sense."* Three students indicate they started buying more local food. The overall vibe of the course was also important.

For several students, it has been new to consider **farming as an important social care system** and that social sustainability is important. One student mentions the intrinsic value of livelihood over production. Several students were triggered by the intrinsic value of other species in farming systems. *"I had never given much thought to the fact that insects, birds and animals should also have access to the resources that we, like them, want to draw from".* A variety of course elements contributed to this, excursions, braiding sweetgrass and lectures. One student does not consider silkworm production as good anymore due to the cruelty of boiling larvae alive. The exercises of putting yourself 'into the shoes' of another being were important for perspective taking.

From the nice students who experienced a conflict of lack of something, 3 mention a conflict with the use of animals in permaculture systems. One mentions the extreme opinions of farmers which caused conflict with her personal values. One missed the fair share principle in the course, two people missed space to reflect on values due to course overload or lack of platform (mostly in the design).

6.10 Trust and confidence

Did this course contribute to your personal feeling of trust or confidence in that you can address the big sustainability challenges we find ourselves in? Which elements of the course contributed to that and how?

To this question, 28 students reacted with a straight **yes,** 6 students were **not sure**, 11 students felt a **partial yes**, 8 students reacted with a straight **no** and 9 students felt **neither** yes or no to this question but got something positive from the course.

From the students who reacted with a straight yes, many felt **hope or confidence** from the **tools of permaculture** and the **real-life examples** in the course for alternative solutions in farming and land management. The l**ectures, excursions and many designs** played a major role in this. Several students mention the **unexpected power of small scale** and **local initiatives.** Having the tool of permaculture gave several students the confidence that they can **use it in their personal life.** The **design** process played a major role in this. Another big theme that gave students hope was to **meet other people** (staff and students) who were passionate about change and capable of coming up with creative designs. Especially making a design together, also with the commissioners, worked empowering. It was important to several students that the teaching team is deeply involved in the theme of the course through various practical initiatives. Several students indicate that it was **the whole course** with all the elements of personal development, technical knowledge and practice that gave them hope and confidence.

The students who felt a **partial yes** felt inspired by the course in the same way as the yes group, but also felt that **societal change is challenging**. They mention the many forces working the other way, the stupidity and stiffness of society, that permaculture is just a bubble, or that the issues cannot really be solved anymore.

The students who were **not sure** had similar responses but were not inspired as much by the course to give a partial yes. Some felt other solutions are necessary, that the problems are just two large or located in areas (politics/mentality shift).

The students who felt that the course had not contributed to any feeling of trust or confidence, indicated similar concerns. One person says the course worsened it because there was no agreement between practitioners about how to address problems.

The students who did not clearly respond with yes, no or not sure did indicate some positive things they took from the course, which could be interpreted as an increase of hope or confidence. These are related to confidence in bottom-up approaches, creativity of people, the impact one person can

have, a glimpse of possibilities, motivation to pursue one's own path, options to change consumption patterns and the many viewpoints in the course.

6.11 Staff evaluation

In a joint evaluation with course coordinator Kees and student assistant Jordy, we have reflected on the new course flow and elements. The course flow was experienced as functional to structuring the course. The sequence of topics felt natural, starting with experience and introduction, grounding in theory and then building towards social/economic and spiritual layers. For this course, it seems that the ecological dimension is the right basis to build further on. It creates a bottom-line to relate to for all students, independent of their study background. It is also the main space in which social, economic and spiritual relations take place. The order of addressing plants,

We reflected that within university, nature is a good entrance for spirituality - as we can offer exercises like the home assignments - where students can go outside to experience something. These are concrete exercises without a pre-set expectation of spirituality, while they offer the opportunity to explore a sense of interconnectedness. The combination of theoretical lectures, practical stories of guest speakers and hands-on activities created a dynamic learning environment in the first week. As a teaching team we experienced that students could make connections between the course elements quite well and they felt immersed in an exciting learning environment. The introduction of morning exercises contributed much to this excitement, as one morning we forgot to send the exercise around and were met with disappointment from the students. The home assignments seemed to have disappeared to the background during the course. In the reflection, they are mentioned often, so they did play an important role. However, we evaluated that they need to be included actively in the course process. The centre of learning really sits between the students' personal experience and the moments of sharing those in the learning community. These moments need to be fostered and balanced with the rest continuously. This insight really clicked in the evaluation of the course, that putting personal experience central to learning requires effective community management. This is a new way of teaching the course that requires adaptation.

We also evaluated that the diversity of perspectives in the first week of the course has created more depth than the previous format. Since the topics were structured and built on one another, there was more interaction between the elements which created depth. This however, also led to more learning questions from the students. In previous years, the content of the course was less contextualised in real life examples. Therefore it appeared more straightforward and less conflicted. This seemed to help students in applying the content to the design task, because it felt less complex. The complexity and depth created by the redesign seemed to result in more struggles with the design, and a bigger demand from students for technical knowledge to resolve their design conflicts. Also quantitative tools are lacking. The call for technical skills and knowledge was recognised by all of us. We evaluated that the skills workshops are a valuable addition to the course in this regard, but it requires better integration in the design task. The skills offered are not the ones the students seek. It also appeared that the design cycle offered in the course is not used in the report writing. We need to get better insight into the design process in future years. However, the reports of the design

sites reflected more felt reflection on the topic of sustainability rather than the usual analytic evaluation. The field exercises seemed to have contributed to more felt expression and reflection.

We evaluated that the bike excursion needs more attention. The students found it difficult to relate the questions of the excursion to ecological design. This has mostly to do with creating more depth and challenge in the assignment and capturing their attention for the details in the landscape. We discussed that it is important to guide the students through this exercise. It needs to be guided by someone who takes them into the landscape, into a new way of looking. The farm work on the other hand appeared to be very functional for learning a variety of things. We did not find any points of improvement from the teaching side on this matter.

Another point of evaluation is that ceremony and artistic creation could have taken place within this course, which was not felt beforehand. Since the learning community manifested strongly during the course as the centre of learning interactions, we evaluated that ceremony and artistic expression could strengthen the sense of community that was valued so much. We also felt that this could also strengthen the intrinsic motivation to participate. The topic of how to stimulate intrinsic motivation has been a big point of discussion. We all feel that we do not want this course to feel compulsory, yet we experience that it is necessary because students are used to this external pressure. Especially in bringing in more 'non-scientific' course elements, we notice that students do not take it as a course prerequisite, even though it was stated as such. We reflected that by emphasising intrinsic learning and learning community, we can create a setting where it feels natural to participate in all activities.

7. Discussion and conclusion

Let us explore how the course redesign has contributed to partnership qualities in this learning community. In the first section I will go through an evaluation of the course elements and in the second I will discuss how they relate to partnership qualities as proposed in the cycle of living, knowing and learning.

7.1 Evaluation of new course elements

Home assignments
The home assignments seem to have been an effective course element to foster a sense of interconnectedness with the world and let students taste NA indigenous spirituality. The chapters of Braiding Sweetgrass resonated well with the students and seemed to have a transformative effect for many. Literature seems to be a good way to introduce other worldviews, it is gentle. A diversity of writers could make the topic of indigenous spirituality more accessible.

The assignment of sitting next to a plant for 5 minutes every day was also effective. Many students who did the practice recount how it caught their curiosity and how they built a relationship to the plant and to their own feelings. What struck me from some responses is that students thought they needed to experience some grand revelation. This might need some attention in the future, that this

is not necessarily the goal of the observation. I feel there is much work to do around the topic of spirituality and some of its cliches. It also struck me that such a simple exercise can have a major effect.

The third assignment of taking the perspective of another being and evaluating the design from that perspective was not mentioned very often in the reflections. It may have been due to time pressure at the end of the course that students did not do the assignment. We are considering to include the exercise in the reflection 'exam' at the end of the course as a way of evaluating the design.

Morning exercises

The morning exercises have also been an effective course element to let students participate more in their direct surroundings, create a sensed understanding of the land and to link concepts of the course to the real living world. Because it was a morning routine, it seems that several students have caught the habit. From the responses in the question on sensitivity it appears that many students remain engaged with the landscape outside the course setting. Again it struck me how such a simple practice has major effects. In combination with the course topic of ecological design, the exercises were included in a larger goal. I feel this is important when introducing sense exercises, so that they are not just 'nice' but actually meaningful. The exercises could have been more powerful if they had been given a more central place in the course. I wonder how students would experience them if they were compulsory. In this way, it was experienced as a gift for them. What also would have strengthened the exercise is more time for sharing experience. This is the most powerful tool of indigenous learning, is to experience the land and share it through story.

Sense of place meditation

Although the sense of place meditation was not mentioned by a very large group of students, it does seem to have been a valuable part of the course. Especially since the Genius Loci concept is already part of the course, it is now more complete with an experiential exercise included. For some students it was very meaningful. It would again be more powerful if it is more clearly linked to the site visit and the design process. The group of students who needed to find the Genius Loci for their commissioner, recount this experience with excitement. It appears that when some concept has meaning in the reality of the 'real' commissioners, the students are much more excited about it. This is an important insight for me generally. It aligns with indigenous learning in that everything is central to survival and meaningful participation. Whatever we teach, it should be possible to experience the meaning of it in a larger context. I discuss this further below, in **Points of resistance.**

It is not clear how many students have done the visualisation exercise upon their first sight visit. Similar to the last home assignment, it seems that these should be included more explicitly in the design process. I am considering to make a nice booklet for the students that helps them to go through the design process, with the cyclical framework explained with nice images, some links to important information sources and space to brainstorm/scribble. This could then include the visualisation exercise and last home assignment. Another option is to make a storytelling moment, but it may also feel uncomfortable. It does appear that embedding such exercises in a sense of community is important. Here a tension comes up between providing a safe space of individuality

and a safe space of community. How to offer these forms of learning in a way that feels attractive is another point of discussion I discuss below.

Bike excursion

It is not clear from the responses to what extent the bike excursion has fulfilled its goals. The idea of it was to explore the landscape through questions and experiences, in order to get a better feeling for landscape dynamics. Some students mention it as an important exercise that increased their sensitivity to the land, but not many. It played an important role for the social processes in the course, doing something together outside. My impression is that the excursion needs a more applied set-up in order to fulfil its goals. It should be more connected to indigenous stories of living of the land.

Farm work

The farm work seems to be an effective element for the course. Many students refer to it in their reflections as a valuable moment to connect to the land, to the farmers and to peers. The corona pandemic may have played a role here, offering students a moment out with peers. I have considered giving some guiding questions on little pieces of paper in a jar to the students to deepen their conversions in a playful way. Especially about the topic of connectedness to the land, which farmers might not talk about automatically.

Social permaculture

The session on social permaculture where we invited various guest speakers was very effective. This session elicited many practical and ethical aspects of farming. The diversity of opinions really challenged students to think for themselves. An unexpected outcome was that the topic of gender and patriarchal values systems related to gender found a place in these discussions. This is in fact an important topic we had not anticipated. The reason this came up was because the speakers included an older man with more typical masculine expectations of farming (high production/good income) and two younger female farmers with more feminine values (community, biodiversity and fair wages).

New lectures

The new lectures on ecological principles of design and nutrient cycles have been important additions. They have grounded the course more in theory. It remains a challenge to provide theoretical depth while relating it to practise. This requires a different approach from guest speakers who are usually either academically focused or practically focused. My impression from the responses is that we could use the concept of adaptive management more clearly and bring in more examples of indigenous management systems. Several students indicated their interest in this.

Learning cycle

The new learning rhythm in the course appears to be an improvement. It offers a structured way of working through different aspects of permaculture, and the ecological, social and spiritual layers involved. It also brings focus in the day. It is also more enjoyable to teach this way. The combination of learning methods used in one day to address a topic of the course turned out very positive. However, it could be improved by linking the learning approaches more explicitly to another. A

reflection moment at the end of each day to integrate the learnings together is very important and was not always secured in practice. The integration of ecological, social and spiritual dimensions seems to have been integrated more explicitly in the discussions and design reports due to the variety of learning approaches.

Skills workshops

The skills workshops are also a good addition to the course, although the content needs to be more catered to the needs of the students in the design process. There is a call for more technical knowledge and tools for calculations. There is a potential to include much more skills. It could be organised in different workshop rounds, where each design group can split up and come back with knowledge to share.

Exams

The way the exams have been redesigned has been an unexpected learning outcome. Several students indicated how much they appreciated the exams. Instead of just being tested on knowledge, they were actual learning moments in and of themselves. Using questions to link concepts and experiences of the course is a good way to integrate knowledge. What remains is the question of assessment. The exams were difficult to grade because there were not 'right' answers. The general problem of assessment is discussed below.

7.2 Assessing transformation towards partnership

In most of the responses from these students it becomes clear that the combination of course elements together has had an impact on their learning experience. The questions of the reflection survey were largely based on the qualities of partnership as reflected in the framework below. Through this framework we can evaluate whether the course elements have contributed to these qualities and in what ways.

Sensitivity

Starting in the early spring of the circle, it appears that various course elements have contributed to increased sensitivity for 52 students. The sensitivity they describe is diverse, related to species, relationships and sensations of the environment. The respondents give the impression that they are more engaged with the living world and perceive it more from the side of the species/system. The course elements that contributed to this were the concepts from such as guilds and intrinsic characteristics of species, but also the home assignments and morning exercises. The combination of these seems to have worked very well. To go outside and apply these concepts to places close to the house, seems to have stimulated a new way of relating to the home environment. Some students use words like awakened or enlivened to describe their sensitivity. I have added the latter to the circle.

Perception

Perception was not a direct topic in the survey, however several students indicated in the sensitivity question that their perception of the world has changed. Especially the concepts of guilds and

permaculture principles have stimulated students to see more relations in the environment, rather than things. The systems perspective also helps to see things as part of a whole. In their responses one can also read that their perception is more goal-oriented, in that they are searching for permaculture possibilities in everything they see. Their perception is guided by personal need, but this need includes needs of other species. Many students share how their perceptions on farming or future society has changed through the course. There is also an element of hope in this perceptual change, which I have added in the circle as Possibilities. Also seeing many different alternatives has changed students' perception of permaculture. The diversity of perspectives also caused some confusion.

Teaching and learning
The way of teaching and learning in the course was indeed experienced as active, emergent and inspiring. The main elements that contributed to this in order of mentioned frequency were the design, the excursions, the home and morning assignments, Braiding sweetgrass and the head/heart/hand trio. The students also experienced that they were mentored with questions rather than taught answers. Overall, this way of learning was experienced as enriching and engaging. It led to better, deeper and more meaningful learning, and real critical discussions. Several students missed answers though, in the form of specific knowledge. There is a tension here in how much knowledge transfer fits the goal of this educational strategy, and how much it is just a point of friction with what students are used to. I find that in this course, there could be more technical knowledge provided to support the design process especially, however I also feel the strength it gives to students once they find their own way. The challenge is to provide what is needed but avoid the turning point into passivity.
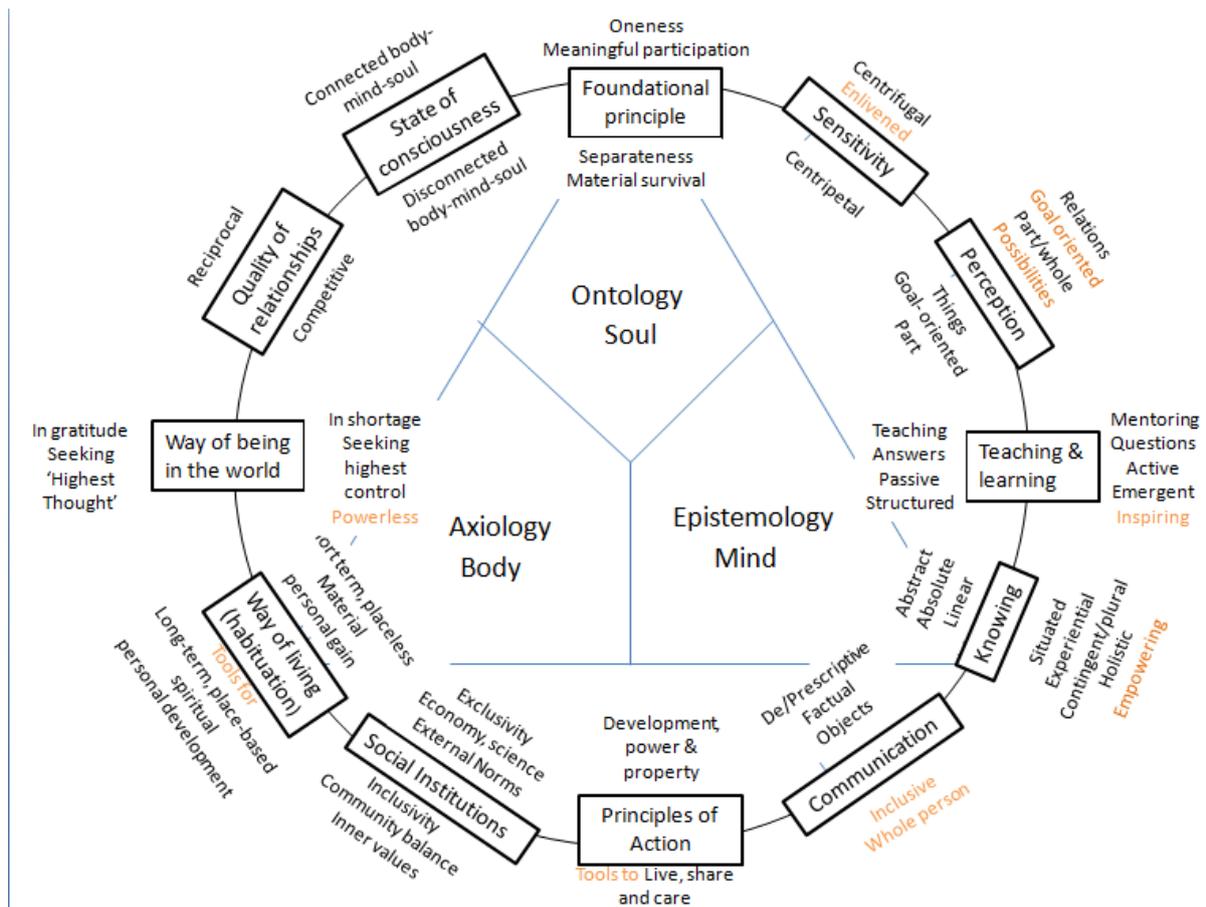
Figure 7. The adapted Wheel of living, knowing and learning.

Knowing

The way students experienced diverse ways of knowing closely aligns with the qualities of situatedness, experiential, contingent/plural and holistic. The combination of theory, observation and intuition was clearly mentioned to create more holistic knowing. Many students experienced that the knowledge gained through the design made it situated and experiential. It was interesting to see that students reflect on what knowledge is and how to deal with it. More attention could be paid to the role of intuition, since it is mentioned in the course but most of us are not familiar with using it in a formal setting. Questions arise as to how intuition stands in relation to other forms of knowledge, is it equally valid and how to use it appropriately? These are important questions if we are to use intuition as a key source of knowledge in daily life and in academia. Intuition can, just like science, lead to false ideas. An unanticipated outcome of the diversity of learning styles was that students felt personally empowered. I have experienced this myself also when I gained confidence in other forms of knowing, however, I had not included it in the circle. I have added it as personal power. It was also unanticipated that the exams would contribute to this. Simply making exams more interactive and personal already has an impact in education.

Communication

At the level of communication, there is little sign of change. The use of factual, descriptive language was normal in the course, and not reflected upon. The only change was perhaps that in discussion students felt more support to share feelings or non-factual thoughts. There was more place to be a

whole person, rather than just a scientist. However language was also not a focus point in the course. Only in assignment 3 there was reference to indigenous language use. It feels that within the space of this course, there is little room for these relational explorations.

Principles of Action

On the level of values, or principles of action, the course offered important tools for the students to actually apply their values. I have added **Tools** to the circle. This is a nice example of wisdom-in-action. This also marks a difference between having values and knowing how to apply them. In the context of the course, it turned out that earth care, people care and fair share can get in conflict with one another. The students were also confronted with this during the design. These values became clearer through practice. Important course elements were the design, the social permaculture lecture and the online excursions. The course offered a way to fine-tune or deepen values, as well as share them with others. A community practice is important for connecting to values and keeping them alive. It seems also that it is important to ask about values in the reflection, so that students can reflect on the process in the course.

Community

In the question about community, it is very clear that the students valued the open and safe environment where intrinsic motivation stood central. Several students describe how much energy it costs to perform under strict regulations and pressure. Only one student lacked pressure and felt lazy. There seems to have been a good balance between community and individuality, where there was a sense of togetherness through exchange and mutual help, as well as space for personal opinions and growth. I was touched to read how some students are deeply affected by this experience. Some have never experienced sincere community throughout their studies. The importance of this could not be stressed more. It does matter who you are and how you behave as a teaching team. It seems to be the simplest element to bring in, just be open, friendly and curious yourself. Mixing different study backgrounds is also important. For a few students it was too free. From the organisation side, I can imagine that it has come across as chaotic at times. Organising the course in a new format in a corona crisis was certainly an organisational challenge. An important note is that when strict regulations are not employed there should still be clarity for students about what to do.

A few students raised the point that conventional farmers were excluded from the community through judgements. This was mostly done by guest speakers from excursions. This brings the note that the space holder of the course should be aware of keeping the discussion space open for all perspectives and staying relatively neutral. Some students also experienced unsafety in the group work. This is not new in course work; however I do reflect that group work should be actively supported by staff. This was at times lacking in this course due to the relatively chaotic course process. Another point of attention is how to include everyone well in community in an online or hybrid learning environment. There could have been more space for engagement in between sessions, and more creativity in facilitating this. However, overall there was a strong sense of inclusivity and community balance supported by a mutual support for intrinsic motivation and inner values.

Ways of life

I had included a question on what students take from this course for their personal way of life. Due to time constraints however I chose not to process these answers, since many students had already responded to it in another way. Through the other questions, students indicate a variety of responses. In the question on overall course experience, students indicate they feel more hopeful, gained a new mindset and some feel more confidence in their career choice for farming (research). Many students experience personal growth during the course. The philosophical/spiritual part of the course played an important role in this. For some, the course played an important role in finally integrating science and other ways of knowing. A few students indicate that they feel more serious about sustainability after the course and changed some consumption habits. It seems that the aspects of long-term, place-based and personal development are already important in the students' way of life. Spirituality for some. Similar to values, the course has given tools to apply in life rather than a change of way of life. I have added **Tools** to the circle. The lure of society to fall into placeless, short term personal gain was at least tempered through the course.

Way of being

One could say that the students participating in this course were already in search of possibilities for 'the highest thought', or well-being of life on earth. The course contributed to the belief that this is possible in some forms, and that there are many alternatives. The aspect of gratitude was expressed indirectly in the outwardly positive experience of the course and the passion of the teaching team. Although students do not say it literally, their answers expressed a sense of heartfulness. Most students indicate that the course has contributed to their trust, although for many the problems of the world are too big to say that they really feel more trust. Many continue their journey with more hope and belief. In contrast, for some students, the course increased their feeling of powerlessness or shortage, because the course made clear how disconnected society is. (I added **powerlessnes**s). This may seem like a minor outcome, but I find it important to provide more care for these students. It is an unforeseen and otherwise invisible outcome. We are not aware that by focusing on positive societal change in this course, we also touch upon the pain. I wonder whether we should include a practice that addresses the pain and anxiety students feel in relation to the future. This needs proper space and time. The strength of the community that is experienced in this course could contribute to some healing.

Quality of relationships

In the question that relates to the learning community, many students refer to the constructive atmosphere of mutual support in the course, both among peers as among staff and students. No one refers to an experience of competition. Collaboration is an important part of the course process, also with the commissioners, and is an integral part of permaculture principles. This collaborative aspect could be emphasised more clearly by guiding the group processes. As indicated in the part of resistances, there were also problems with the group work and in their interaction with the commissioner. I deal with this in the section below.

State of consciousness

I left out a question directly relating to this aspect. Students do reflect that through the head, heart and hands approach they felt more connected in themselves throughout the course. This is also expressed as feeling more human. Several students express a relief and joy (sense of peace) with the

inclusive approach of this course, and how conflicted they have sometimes felt in the university system that over emphasises cognitive, high-pressure input of information. Several students indicated earlier that the inclusion of multiple ways of learning made it easier to remember and integrate the material.

Foundational principle

The answer related to a worldview of interconnectedness gives some insight in the effects of the course for the students on this matter. A sense of unity with the world seems to have been stimulated through the variety of learning approaches. Some students refer to Braiding Sweetgrass, some to the permaculture concepts, some to the observation exercises and some to the design. In all these activities, a sense of unity has been prominent and it appears valuable to engage through these diverse ways. Some students feel more, others reflect more practically on interconnectedness. Diversity of approaches is important here. Interconnectedness can be experienced in a variety of ways; it is not necessarily the more spiritual way that should be achieved. For several students, the approaches generated more meaningful participation in life. I wonder whether more cognitive experiences of interconnectedness equally contribute to this. Again, it is also important to work with interconnectedness, to learn how to apply it, do it and make decisions with it.

Overall, it seems that most qualities as identified on the wheel of living, knowing and learning have been touched by the course. The inner ring has come more into balance with the outer ring. The variety of course elements has contributed to this. For as much as one course can have an impact, it seems it had an impact. However, there have also been points of resistance and disappointment.

Points of resistance and conflict

The topic of spirituality was the most frequently mentioned point of conflict, although still only for 9 students. The number of students who expressed this may have been fewer than the ones who experienced it. What seems important is that students do not feel pressured to experience something. Only one student indicates this. Others indicate that they do not identify with the proposed spirituality. There is tension here with introducing exercises as compulsory and giving a safe space for students to set boundaries. The trouble is that students are so used to only doing what is compulsory, that it is hard to propose exercises in another way. Here lies a challenge for change within the system, how to make learning an attractive invitation again. For other students, the inclusion of spirituality has been deeply valuable. I propose that spirituality is an important topic to bring into higher education, especially because it challenges the secular fence of knowledge and makes way for different ways of being. But it requires careful conduct in the way it is introduced. In this course, this is a challenge because there are many elements and the design exercise takes most of everybody's attention. Kees has always addressed spirituality, but rather by telling stories. To include it in the form of a structured exercise with a certain level of compulsion, brings some friction.

This reflects a general concern of the place for these alternative learning forms in formal education. How to stimulate them in a proper way? I found this especially challenging in course form where other parts are compulsory. In another course I teach, the entire training is experiential and has no 'coursy' elements. Students just participate in the whole program, which feels nice and attractive. However, in an existing course form, the compulsory elements need to be there. Adding new elements without making them compulsory makes them 'just extra', which then does not really have

the impact that is sought for. Here I also feel that we need new conceptualisation of course work. If we can make it felt how certain activities are meaningful in a larger context of life, this changes the atmosphere of learning. This effect was clear from the design assignment, which was real and important for a real person in real life. Learning activities need to be embedded in this realness to come out of the fake reality of 'compulsory' exercises for grades.

Another way is to integrate exercises as group activities. This triggers the motivation to now miss out on what peers are doing and exploring something together. However, the tension here is in providing enough Individual safety and community safety. Especially concerning sensitive and personal topics, there needs to be enough safety for an individual to set boundaries to the experience and enough safety in the group to share sensitivities. I realised through this course that we are in need of new social structures. The majority of the course was still taught from an old-fashioned way, with a teacher/coordinator and some other staff. What is needed is a learning community, like a tribe. With different social roles and flexibility for the learners to choose their mentors. If we are mentoring questions more than teaching knowledge, we need more mentors.

Most students seem to have enjoyed the diversity of perspectives in the course, but it also caused some friction. Again, what is important here is that good mentoring is offered to guide the learning process. This is a challenge with 67 students. Again community plays an important role. I believe that community structures could more actively be created to make a bedding for personal experience as the centre of learning. For example, creating peer groups with each one member of the teaching team as mentor. There could be sessions dedicated to feedback and peer exchange, which was indeed missed in the course. This way of learning elicits a lot of discussion, which should be mentored actively. It also elicits a deeper, more personal form of learning for which it is important to create a community for support. It is not practical that one coordinator is responsible for the wellbeing of the whole group. We need roles of elders, aunties and uncles in the team as well as peer support. Community management is a whole new thing compared to top-down teaching. I realise now how important this is.

Another main disappointment in the course was a reported lack of technical knowledge. What these students do not know, however, is that the course included much more technical knowledge in this version than the previous ones. But this was not explicitly mentioned. However, I do recognise that there is very little factual input in this course. Perhaps during the design process there could be more skills workshops. The criticism that the course is unscientific has two sides, because eventually students also experience the positive side of this. The main takeaway is the question of how to interrelate scientific and non-scientific knowledge within a course setting. Validity of knowledge is a big philosophical question that cannot be addressed within this course setting. It needs to be addressed more formally though if we are to use multiple forms of knowledge seriously.

The topic of study load was recurrent in the responses. There were 12 students who experienced the course as overwhelming due to the workload, while 10 other students experienced it as more relaxed than other courses due to the lack of pressure from the teaching team. The issue with this course is that the study pressure depends much on how the design case goes, this is a somewhat unpredictable and varied part of the course. Students often run into practical issues of getting to the site in time, despite the fact that we make clear appointments with the commissioner beforehand.

Or they run into a problem with the design which leads to lack of time in the later process. There is overall little room, so any loss of time in the process immediately leads to pressures. The main message here is that introducing new forms of learning and applying more real-life learning does need time. It would be valuable if this course could be extended, but it is unlikely that it will. If other courses introduce more relational learning, then not everything needs to be in one course.

The corona pandemic has also been a point of friction and has surely affected the results, however not clearly in one direction. For some students the online learning environment inhibited full participation in the course elements. It is important to plan informal time together online and activate interaction in these moments through play. It is also important to acknowledge the emotion of the situation and include everyone in the sense of community. The overall aim to introduce more sensory and experienced learning may have been hampered for all students due to screen time. On the other hand, it seems that the online situation made the home exercises and outdoor excursions more impactful and appreciable. It may also have influenced the experience of group work, which appeared to be a surprisingly positive experience for the students. At Wageningen University, many courses incorporate group work, with various levels of success due to group dynamics and intercultural differences. The result that group work in this course had a deep inspirational impact may have resulted from social isolation of the students in other courses. In any case, this example shows that indigenous inspired learning can be effective even in an online setting. The combination of letting students experience things and discussing together online creates space to link the living world to the online classroom.

An unexpected outcome for me was the importance of the teaching team. I had never realised how inspiring we were for the students and how much this positivity about permaculture affects students. Also the kindness and helpfulness which are really normal for me, are special. That one student mentions the light in Kees' eyes is quite special. I feel that within the framework of this thesis of oneness and Oneness, the way of interacting with each other as people is one of the most important things. When we relate to each other with a sense of Oneness, this automatically draws others into it. In this we indeed work from an underlying worldview of trust in life and in each other.

7.3 Evaluation of research methods

The course redesign inspired on indigenous ways of living, knowing and learning has worked rather positively for the students and teaching staff. Although there were a few students who were disappointed, the vast majority appears to have noted positive effects from the elements in the course in terms of teaching methods, the content and the learning community. The course is being continued in the present format, and it is experienced that the redesign has contributed to the variety of aspects outlined above. A main question remains is whether the outcomes are indeed due to the course redesign, or just the original template of the course, or the students themselves. The vast majority of the students indicated a high level of awareness of the global crisis and various levels of involvement with better futures. Many of the concepts and practices in the course are not new. The permaculture course has been rated positively by students consistently in the past years before redesign. We have no in-depth measurements of the course before the changes were made

unfortunately. It also shows that the design assignment which has always been the central part of the course, consistently came out as the most often mentioned course element that contributed to the overall course experience, inspiration and diverse ways of knowing. It is also consistently mentioned in the other aspects. It is the main element of the course, and integrates several activities of connecting to the land, to each other and connecting content knowledge to practice. It is also the most tangible exercise through which students experience their own learning. However, in the results it also shows that the other elements have contributed to aspects of the learning wheel. My impression is that the diversity of learning approaches has contributed to the design assignment, but also the overall learning community of the course. Although not everyone has immersed him or herself in the full set of assignments, the topics of spirituality and connection to land were prominent in conversations and discussions. The learning approaches have made the course more alive. It appears that the diversity of approaches has strengthened the integration of ecological, social and spiritual layers, both for students and staff. I do see a challenge in this course to deepen these layers, because the task of designing is rather overwhelming in such a short time span. This element of haste is counterproductive to the ways of learning we are actually aiming for. It makes it difficult to make other elements than the design important. I see improvement in linking course elements to each other and integrating assignments into the design process. This is a level of improvement that requires experience with the course.

Another question is whether the survey has managed to clearly bring out the experiences of the course. I noticed that it was difficult for the students to pinpoint the exact elements that contributed to particular aspects of their learning. Therefore we only partially measured the effects of the course elements. The survey works better at measuring the effects of the overall course on a variety of topics. However, we also cannot suppose that each element has separate effects. The overall experience with various elements created the learning environment. I considered to host a focus group right after the course, but due personal circumstance this was not feasible. This could have given more in-depth insight into the interaction of course elements.

It is a problem in general in our educational system that we hardly know the effects of the learning environment for students. In an indigenous community setting this would have been observable. I feel a tension in introducing learning methods that are personal and may affect students more deeply while we cannot provide the personal attention to mentor this. It also changes the relationship to the staff to a more personal one, which brings totally new ethical questions to teaching in higher education. Nonetheless, I believe we should continue to explore this fuzzy route because the current ways do not create what we need to care of the earth and each other.

7.3 Conclusions

The process of this research has contributed to my personal understanding of what 'regenerative culture' can mean and how to bring it into a curriculum. The spiritual understanding of sustainability that I employ has taken me much effort to bring on. Even to the last moment a voice in my head told me it's not founded on anything. I have felt the secular fence of knowledge all through this thesis like an invisible hand pushing me back and denying everything I feel inside as true for me. I feel that by writing this thesis, I have broken its effect on me. Hopefully it supports others to deal with the fence

too. It has also contributed to a healing process, uniting what I experienced as polarities in the beginning into functional layers of being in the world. This research has consolidated many of the concepts I intuitively understood before starting. The two cultural systems that I frame as opposites on the Wheel of living, knowing and learning are not opposites, but layers of being, both of which are functional in different circumstances. Wisdom-in-action is the wise use of our capacities in context. When they collaborate well, a more complex and 'generative' being emerges. This has become for me the core of regenerative culture. The collaboration of our two ways of being one: one the individual and One - the whole. When they collaborate, a unique one emerges: not just another physical body, but an enlivened, vibrant one. A physical body that is a temporary expression of the mysterious self. It is the edge of continuity and change. Wisdom and skilful means in Buddhism, wisdom and growth in the medicine Wheel. The one alone just wants to survive, the One alone cannot live or die, the unique one emerges from the two and participates in both. This is meaningful participation. It is based on a worldview that life is generative. Through the awareness of One, we participate in a larger whole. A regenerative culture allows the Oneness back into oneness.
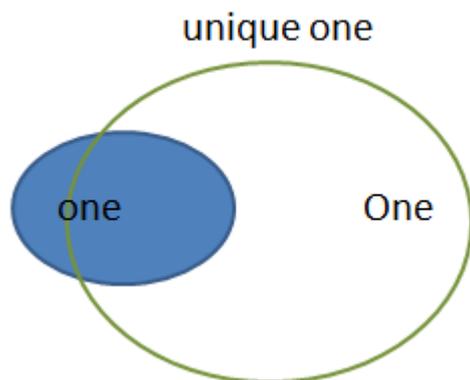
In academia, this is a process of dropping the secular fence of knowledge that sustains "*human capital models of education, where knowledge and human learning is seen as tools of material capital and profit*" (Shahjahan & Haverkos, 2011:17). Shahjahan and Haverkos write that Indigenous knowledges are important for interrogating the various ontologies that are transmitted and validated in higher education and *"legitimising ways of knowing that include intuition, emotion, oral traditions, language systems, body and interconnection of human and non-human, seen and unseen spirit"* (ibid). Through this study, I feel some pathways have become clear to work with indigenous cultural influences in the context of higher education. The permaculture and ecological design course has been ideal in some ways, integrating meaningful participation in life with appropriate forms of survival and resources use. However, due to the course focus on practical design, some of the above aspects have not had the main focus in the course. Still it does appear that above mentioned human qualities have been explored and legitimised. In this course we have not performed rituals, nor have we reconceptualized notions of time or slowed down (Some, 2003). The awareness of not just being an individualistic social being but a spiritual being, interconnected with others, was only gently touched upon while it is so central to indigeneity and the above interpretation of regenerative cultures. And yet, the answers of the students do reflect the vibrance and passion of this spirituality. Going to back to the properties that Banuri and Marglin assign to indigenous knowledge (the embeddedness of knowledge in local cultural milieu, the importance of community, lack of separation between nature and culture, subject and objects, attachment to the local environment as irreplaceable place and a non-instrumental approach to nature) I find the indigenisation of this course to be successful (1993). The students express in their overall responses that the knowledge they gained throughout this course was embedded or situated, that they felt the

importance of community in the course, that humans have a place in nature, that species are important subjects in the landscape and that they care more about the land, whether it directly provides for them or not. I feel hopeful that our work is effective in fostering partnership culture and that our own wisdom-in-action has grown and deepened thanks to this research work.

8. Recommendations for similar educational projects

Make personal learning central

Balance a variety of learning approaches and link them around topics/themes. Let them collaborate.

Cycle themes and learning approaches in an order that fosters layered integration, for example using the hoop of life. Adjust it to processes of exploring, employing, reflecting and integrating.

Create a safe and strong learning community among staff and students through equality, respect, openness, honesty, humility, friendliness, generosity and care.

Try to create different roles similar to elders, aunties and older brothers/sisters that students can relate to.

Invite non-human nature as a teacher.

Bring a diversity of voices and perspectives into the learning environment, but also actively create spaces to integrate these perspectives.

Create an open, critical, humorous, reflective, sensitive atmosphere

Make it real. Apply what you learn as much as possible in a real-life context

When bringing in spirituality, nature and silence-based approaches seem appropriate in the context of academia. Provide an open, explorative view on spirituality. Make sensing the point of departure and do not force or induce any experience. Explore together. Link it to the wider context of ontological change in relation to capitalist modes of production.

Realise that many students have feelings of anxiety concerning the future. This is especially important when talking about sustainability issues in class. Create ways to honour grief and explore hope.

Use artistic creation and ceremony as much as is appropriate to the course.

Use stories and storytelling to integrate factual and relational knowledge. Let students tell stories and include their whole being in the creation of knowledge.

Do practical things with the hands.

Reflect on the validity and appropriate use of different forms of knowledge in different contexts.

Have fun

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Appendix

1a: Course overview 2020

	Program	Lecturers
	Program	Lecturers
Monday	Intro to Permaculture: programme, assessment	Kees van Veluw
	Meeting each other, 10 design principles, bean exp.	
	Design Principles at Food Forest Droevendaal	
	Design Principles at Food Forest Droevendaal	
Tuesday	Excursion Ketelbroek **by Bus**	Wouter van Eck, Food Forester Ketelbroek
	Excursion Ketelbroek	Wouter van Eck
	Reading/Self Study	
	Reading/Self Study	
Wednesday	Food Forest Design	Wouter van Eck
	Assignment	Wouter van Eck
	Permaculture, Nutrition and Carrying Capacity	Corne van Dooren, Staff Voedingscentrum
	Examples + Steps in Designing + assignment black walnut	Kees van Veluw
Thursday	Eco-literacy: theory and test	Kees van Veluw
	Discussion with Floor de Kanter: Organic Farmer	
	Commonland	Matthijs Boeschoten, staff of Commonland
	Genius Loci; the spirit of the design site	Gabrielle Bartelse, staff of WUR Landschaparchitecture
Friday	Design Sites for Part 2	Kees van Veluw
	Heleen Verbeek and and Marjolein Lommen	Graduated WUR students presenting their experiences in setting up an urban farm
	Reflection on first week	Kees van Veluw
	Reading/Self Study	
Monday	Agro Ecology and Biodiversity+ Edge-experiment Droevendaal	Dirk van Apeldoorn, staff member Farming Systems Ecology
	Assignment	
	Canvas Business Model applied on Food Forest Ketelbroek	Idco Duijnhouwer, Independent consultant
	preparing exam	
Tuesday	Exam on part 1	
	Exam on part 1	
Part 2. Designing	Steps in Applying Design Principles at Droevendaal FF	Kees van Veluw
	Steps in Applying Design Principles at Droevendaal FF + Formation of design teams	
Wednesday	Excursion to Nieuwe Ronde and The Creative Garden	
	Excursion to Fruittuin van West Amsterdam **by Bus**	
	Excursion to Fruittuin van West Amsterdam	
Thursday	Visit own design location; start with design steps 1-3	Farmer
Friday	Designing in groups; first steps	
	Designing in groups; first steps	
Monday	First Reflection with individual groups	Kees van Veluw
		Louise van der Stok
Tuesday	Continuation Designing in groups step 4-6	
Wednesday	Continuation Designing in groups	
	Continuation Designing in	
	Free Ascension day	
Friday	End Reflection on Designs (all groups, plenary)	Kees van Veluw
	End Reflection on Designs (all groups, plenary)	Louise van der Stok
	Guidelines on Poster Presentation and Assessment	
	Preparation of Poster of Design and Report	
Monday	Preparation of Poster of Design and Report	
Tuesday	Poster Market and assessment of Designs	Kees van Veluw
	Poster Market and assessment of Designs	
	Poster Market and assessment of Designs	
	Evaluation of Designs	
Wednesday	Report writing	
Part 3. Presentation		
Evaluation		
Assessment		
Thursday	Report writing	
	Hand in Report	
Friday	Preparation exam	
	Preparation exam	
PC 0713	Exam Part 2 and 3	

Appendix 1b: Content exam 2020

Name:.........   **Registration number:.....................................**

Content Exam ED&PC 2020

May 19; 9.30 to 12.00 hours

Please answer question 1 to 5.

In brackets the number of points you can score for the questions,

This exam counts for 30% of your overall mark. You have to score more than 5.6 to pass this course

Answer each (sub)-question in not more than 250 words!

Read first all 5 questions before you start.

You are allowed to use all your lecture notes and all Bright Space documents and internet, but....

I hereby promise that during this exam I do not discuss or chat with my fellow students or other people through any digital means!

We will assess your answers on:

- is your answer consistent?

- do you include/apply a system thinking-approach?

- do you use references for your statements? Preferably references from the compulsory literature and

lectures. By this you can show that you have studied the literature and the lectures.

- Is your answer to the points and without irrelevant information?

- Is your answer creative?

1. Upscaling? (25 points)

The farms which we have visited by video-excursions are quite small. Especially CSA farms.

What fits better in the 3 Permaculture ethics and the 10 Design principles and also the lecture on Ecological processes: 1000 farms of 1 ha or 1 farm of 1000 ha? Give at least 7 sound arguments for your assessment!

2. Guilds and design. (25 points)

Design a small scale guild in the Dutch climate zone

- Needs
- Functions
- Elements

-What (genes)

-Where (space)

-When (time)

150 cm

150 cm

N

2 meter high living windbreak
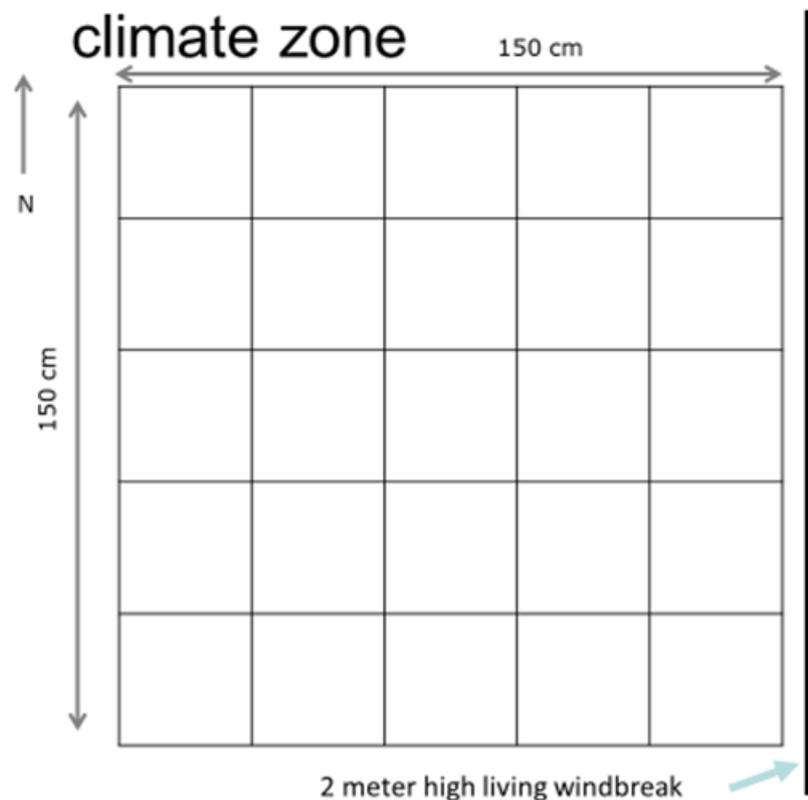
Observe the adapted slide 49 of the ppt of Dirk van Apeldoorn (May 15 agro_ecological_Design2020):

Design a simple annual vegetable garden with information in the same ppt, for example slide 32, 41 and 42 and, of course, all the knowledge learned in the past week.

You have 1 small farm of 1.50 m long, 1.50 m wide and 1.0 m deep, with excellent soil. Use the 10 Design principles as much as possible. You may use the design as in the ppt slide with 25 small plots; you may also decide to make it one plot of 1.50 by 1.50 meter.

3. Eco-literacy

a. How are you defining Ecoliteracy? (5 points)

b. Which elements/concepts/ideas did you hear back from you definition in the lecture of Gabrielle Bartelse on Genius Loci and in the lecture of Jordy and Louise about Ecological Design in Agri-food systems? (20 points)

4. Tips for Ketelbroek Food Forest. (25 points) (Inspired by Anna Minke Roodhof)

Here you see the design of Wouter van Ecks Foodforest Ketelbroek:
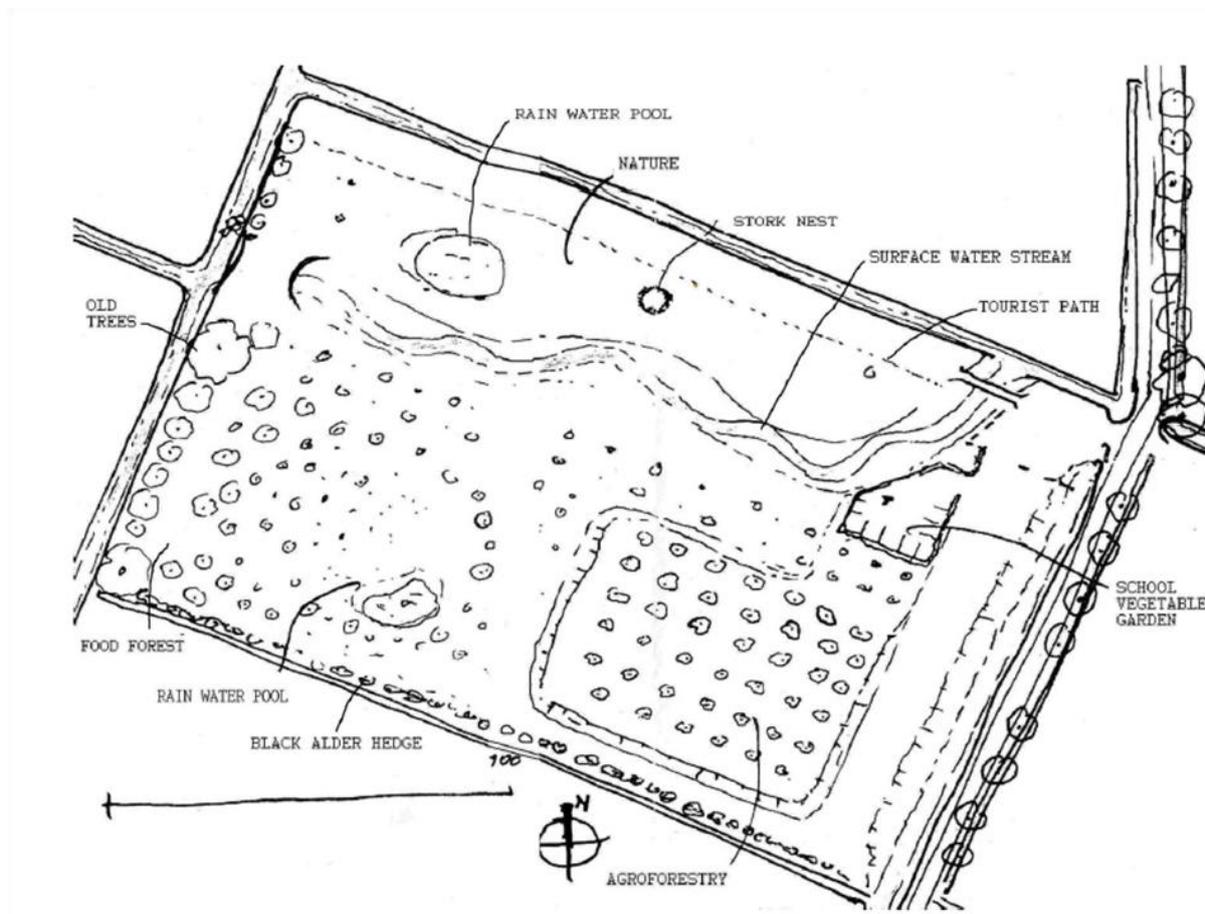
Give at least 5 sound tips/improvements to show the limitations/challenges of the PC design principles. Give arguments for your tips!

5. Animals/Livestock (25 points)

Wouter van Eck was very clear in his presentation and vision: livestock do not belong in a food forest, even chickens are not wanted in his food forest since they need every day care and most probably foxes will snatch them within a short time. On the other hand, Mark Shepard includes on purpose livestock in his farm and Ichsani Wheeler mentions that only with larges animals we can create real mineral cycles, locally and worldwide.

What now? Should we include animals in our Designs? Why and How? Give sound arguments!

Appendix 1c. Reflection exam 2020

Online & Open Book Reflection Exam Ecological Design and Permaculture

FSE 50306

Friday June 5, 2020

14.00 to 16.30 hours.

Support as much as possible your reflection with scientific arguments / reasons / proof / experiences / drawings / pictures in and from this course! This exam counts for 30% of your overall mark.

I hereby promise that during this exam I do not discuss or chat with my fellow students through any digital mean!

Mail your answers at 16.30 hours today to me: kees.vanveluw@wur.nl

Be sure you put your name and add page numbers in the word/pdf document.

Put in the subject box: 'Your Name' and 'reflection exam PC'

Please answer all questions (Between bracket the maximal score for each question)

These are essay questions with room for elaboration using references, drawings etc.; answer each (sub) question with maximum 250 words!

I will assess your 5 short essays on the following indicators:

- is it a consistent and scientific story?

- do you have relevant/sound arguments to support your reflection?

- do you use examples (from the course) to explain your reflection?

- do you use (scientific) references to support your statements/reflection

- have you used pictures, graphs, illustrations, schemes etc. that explain your reflection?

PLEASE ALSO FILL IN THE DIGITAL COURSE EVALUATION WHICH HAS BEEN SENT TO YOU TODAY!

If you have questions during the exam: mail me! I am fully stand by!

I also have opened the usual zoom link so you meet me there!

QUESTIONS:

1. Looking back (3 x 10 points)

When you look back to this course:

a. What, in this course, was your peak concept/idea/insight/experience/moments? Why? What did you do with it?

b. What was the worst concept/idea/insight/moment/experience in this course? Why? What did you do with it?

c. What gave you energy and what took energy from you in this course? Why or Why not. Please support your opinion with examples

2. Home assignment (20 points)

Did you sow seeds at home? If yes-> What did you do and what did you learn from that? If no-> why and what did you learn from that? Take the three Knowledge dimension (Head-Heart-Hands) in consideration in your answer.

3. Optional Literature (10 points)

Which optional literature/documentary/podcast did you read/watch/listened besides the compulsory literature? Give title and describe how it contributed to achieve the 4 learning goals of this course

4. Assessment of your own design (20 points)

Take your own design in your mind. Is your design sustainable?

Hint: give first your definition of sustainability and after that assess if your design is sustainable. Give sound arguments and examples that support your assessment

5. Assessment of Permaculture (20 points)

What are weak points of Permaculture as a design method and what are you doing to overcome these weak points?

Appendix 2a: **Field practical Bike excursion – Reading the landscape**

(Preparation for design site landscape interview)

Date:

<u>Please bring:</u>

Notebook

Two bottles of jars

Your bicycle

Time slots	Group 1	Group 2
14.00 – 15.30	River flood plains	Wageningse Eng
15.50- 17.20	Wageningse Eng	River Flood Plains

During this excursion you are going to focus on reading the landscape. When you make a permaculture design, you need to understand the ecology and natural fluxes of the area. This excursion is a preparation for the landscape interview that you will do at your design site next week.

You are going to visit two areas with different soils and different microclimates. The purpose of this exercise is to train your observation skills of soils, landscape patterns, species, in and outputs of energy (wind, water, sun) and human participation in the landscape. Through the questions below, you are stimulated to understand the implications of the landscape if you would start a permaculture there. Fill in your thoughts and observations and hand in the paper at the end. We are curious what you saw!

Soil sampling

At each location you will take two different kind of soil samples.

1) Checking the soil horizons and groundwater level with an auger. In case you do not know how to use the auger, you can ask the assistant.

2) Do a jar test: take some soil from the top 15 cm and put it in your bottle or jar. When you come home you add water and shake the jar for 5 minutes. Then you leave the jar, and check it after several hours, and again the next day. What do you see?

Observation exercise

Walk around the area in groups of 4 people. Go through the questions below and discuss with each other.

Look around, what is this landscape like?

- Is it wet or dry? What influences the temperature and moisture here? What is the effect of the wind in this place? How deep would the ground water be?

- What kind of vegetation do you see? Do you recognize certain indicator species?* Or do you recognize a certain vegetation pattern?

- What does the vegetation tell you about the soil? Humidity? Fertility? What is effect of the vegetation on temperature/humidity/wind speed/light conditions?

- What is the soil like? Dig up a sample with the auger – go as deep as seems interesting to you. What do you see? What can you tell on the basis of this soil? Put some in your jar to take home.

- What kind of animals live in this landscape? Do you see signs of animal life? Maybe tracks? Think about the animals which are probably here but which you cannot see immediately.

- What do these animals need to live in this landscape? Is life here abundant or scarce? What effect would they have on your permaculture if you started one here?

- What kind of humans activity do you see in this landscape? How do people follow the logic of the landscape in terms of their movement (paths)?

- Do you see examples of people using the opportunities of this landscape for their needs and goals? in the ways that make use of the natural vegetation, the soil type, the water availability?

- Do you see examples of people forcing their will onto the landscape? Do you think this adds value to the landscape and it's living beings or not?

- What are the needs of this landscape to be healthy and productive in the short and long term? What are the needs of the species that live here?

- How could a permaculture project/human activity add value to this landscape?

Take 20 minutes at the end of the excursion with your group to reflect on your experiences of today. Can you connect the lectures of yesterday and today with this exercise? What did you learn? What questions come to mind?

Appendix 2b: Sense of Place visualization exercise in class

Introduction myself & whats's up for the coming hour

Sense of place

Fig. 1. The relationships among key sense of place concepts.
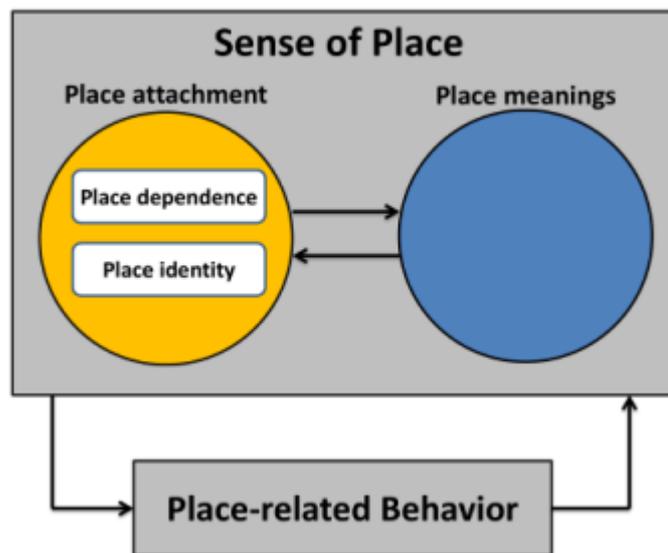
Visualization exercise:

Sitting: Make sure you place yourself in a comfortable, upright, sitting position on a chair or on a cushion on the ground. Tuck in your chin slightly, so that the top of your head points towards the ceiling. Gently close your eyes and notice how this changes the experience of the sitting. <> Notice what you hear around you and then gradually turn your attention inwards.

Breathing: Start observing your breath. You don't have to change anything to it, just observe. <> Follow the air moving from your surroundings inwards through your nose and thereby becoming your breath, becoming part of your body. <> Follow the breath on its way through your body. Notice how your belly or your chest, maybe both are moving on the inhale. <> Also follow your breath on its way back through your body, leaving via the nose into your surroundings. Notice the temperature difference of the cold air coming into your nose on an inbreath and the warm air leaving the nose on the outbreath. <> Then try to elongate your inhale by breathing deep into the belly. Feel how first your belly and then also the chest expands while doing this. Try to keep your neck and shoulders relaxed. <> Try also to elongate your exhale. As long as the inhale or maybe even longer.

Visualization: Now go with your attention to a place in a natural or semi-natural surrounding that has special meaning to you. <> A place to which you experience a special connection. <> Maybe multiple places pop up into your head now. That is fine. Observe them, and then just choose one of

them. There is no right or wrong. <> When you have chosen a place, try to visualize the place as clearly and detailed as possible. <> How does the place look like? <> Are you in this place now yourself or are you observing from a distance? And are you your present self or a younger version? <> Can you distinguish different elements in the landscape? What is the landscape like? <> In what season is the place? And how do you distinguish that? <> Are there specific sounds related to this place? Try to experience these too. <> And are there any smells you associate to this place? Can you experience these now as well? <> How do you feel at this place? Are these comfortable or uncomfortable feelings? Try to experience these feelings. <> Be in this place for a little while longer and experience it as it comes to you <> Look at all the elements in the landscape surrounding you <> Then gradually let the visualization vade away and come back to your breathing.

Closing: Come back to the present moment. Notice the environment where you are sitting. Listen to the sounds around you. Then gently open your eyes again and let them adjust again to the light in your room.

Drawing

Stay silent and in the moment and grab now your paper and colored pencils. Draw the place you have just visualized as detailed as possible. You can also draw yourself in it if you want. Try to capture your experience in the landscape by using colors and expressing the associated sounds, smells and feelings as well. You can also write these down if you find it difficult to express it visually.

Sharing (15 min):

Breakout rooms of 3.

Start by sharing your drawings. Take 2 minutes per person to share experiences guided by the drawings. Also reflect on the exercise. How did you experience it? Then reflect on the following question:

What makes you feel connected to this particular place?

Discuss how the concept Sense of Place may play a role in your permaculture design.

Explanation field exercise

Closing

Appendix 2c: Cycle of design
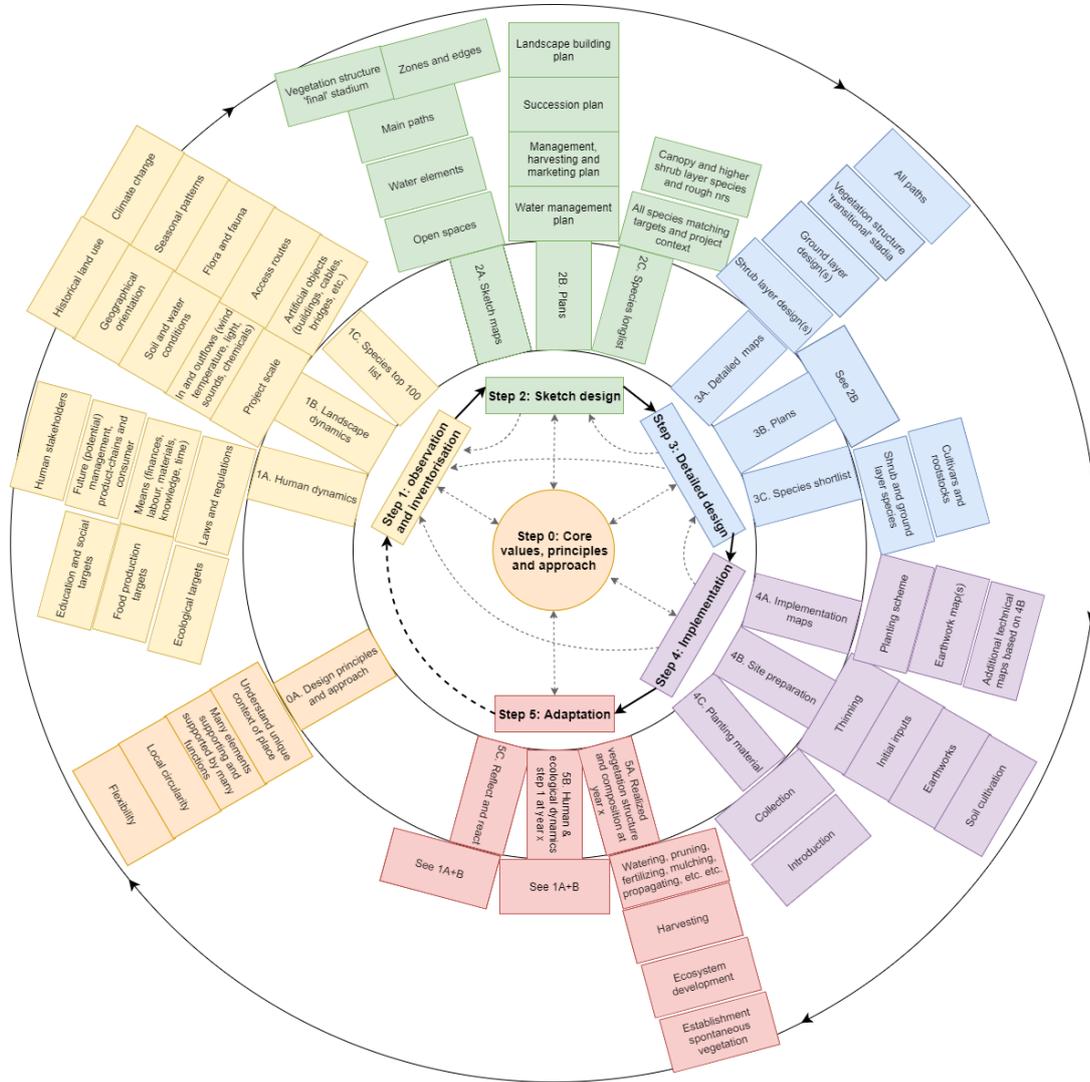
Appendix 2d: Field exercise – design visualization

On site activity (if this is not possible, do this exercise in another landscape)

In this exercise you are guided in about 15 minutes through a visualization of your design. You can download the recording of the visualization exercise on Brightspace. Do the first two parts of this exercise individually (visualization, drawing). In the last phase you share your visualizations within your group and reflect upon your design collectively.

Needed:

- A downloaded recording of the visualization exercise

- Your phone + headphones

- Paper and pencils (or anything else) to draw

- An open mind

Part 1: Visualization

If possible, find a place in the landscape you are designing. If this is not possible for you, find another place to sit or lie down for about 15 minutes, preferably outdoors. If you have some, use headphones for this exercise.

Start the recording and let yourself be guided through the visualization exercise.

Part 2: Drawing

Follow the instructions given at the end of the visualization exercise. Draw the place as detailed as possible. Take about 10 minutes to do so.

Part 3: Sharing

Now you've all visualized the place and drew your designs individually, start sharing your experiences and designs within the group. Start from your drawings. Let each group member explain what he or she has seen and/or drawn. Together reflect upon the exercise and ask yourselves some questions. Are the landscapes you drew very different? Are there any common elements that you drew? Is there any inspiration you can take with you for the actual design? Make notes of your ideas and save your drawings for later.

Enjoy the rest of your day!

Appendix 2c: Field exercise - visualization (text).

Starting: Hi there. Welcome to this field exercise. In the coming 15 minutes you will immerse yourself in the place you are designing. The exercise works best when you wear headphones. To start, find yourself a comfortable place where you can sit or lie down. If possible find a place on the site that you are designing. If not, find another comfortable place, preferably outdoors. *You can pause the recording here to find a suitable place.* When you found a comfortable place for yourself, close your eyes. <> First of all listen to the sounds that are around you. <> Can you hear birds around you? The wind maybe? <> Very likely there are other sounds as well. Maybe cars, machines... Just notice all the sounds that are there and then shift your attention away from them <> Shift your attention to what you smell around you. <> Maybe you smell fresh or dried grass. Flowers possibly. Smells of animals around you or any fertilizers on the field. <> Just observe all the smells <> Notice whether you are enjoying these smells or that they are rather disturbing to you <> <> When you've noticed the smells, shift your attention to what you are feeling <> Can you feel the wind? Maybe you feel the warmth of the sun or a drizzling rain. <> Feel how you are seated on the grass or on anything else <> Feel how the earth is carrying your body <>

Breathing: Then shift your attention inwards. Start observing your breath. You don't have to change anything to it, just observe. <> Follow the air moving from your surroundings inwards through your nose and thereby becoming your breath, becoming part of your body. <> Follow the breath on its way through your body. Notice how your belly, your chest, or maybe both are moving on the inhale. <> Also follow your breath on its way back through your body, leaving via the nose into your surroundings. <> Notice the temperature difference of the cold air coming into your nose on an inbreath and the warm air leaving the nose on the outbreath. <> Then try to elongate your inhale by breathing deep into the belly. Feel how first your belly and then also the chest expands while doing this. Try to keep your neck and shoulders relaxed. <> Try also to elongate your exhale. As long as the inhale or maybe even longer. <> Let the focus on your breathing go.

Visualization: Now visualize the place you are designing <> Imagine your design is already done <> How does the landscape around you look like? <> What zones have you designed? <> Place yourself in a place in the landscape you like the most <> What plants and trees are around you? <> What animals do you see? <> Try to imagine how the place would smell like <> Where do these smells come from? <> Apart from yourself, do you see other people in the landscape? <> How are they using the place? <> What elements in the landscape are attractive to these people? <> Now imagine the atmosphere of the place <> How do you feel in this place? How do other people feel in this place? <> What is in in the place that creates that feeling? <> Then imagine you are a bee <> You fly around the landscape <> Do you feel home in this place? <> What elements in the landscape make you feel welcome? <> If you do not feel comfortable as a bee in the landscape, what would you need to feel home? <> Add these elements to your landscape as well. <> Now take any other non-human perspective <> How do you feel now in the landscape? <> How does the landscape look like from this perspective? <> How do you feel? <> Is anything there you would need to live a happy life in this landscape? <> If not, try to imagine what you would need and add these elements to the landscape <> Then go back to your own perspective <> How do you feel now in the landscape? <> Zoom out and imagine you are flying as a bird over the landscape

<> How does it look like now? <> When you have a clear image you can slowly let it fade away.

Closing: Come back to your breathing. <> Notice how your breathing is different now then when you started. <> Become aware again of your surroundings <> Feel how you are lying or sitting in the grass or on something else <> Become aware again of the sounds around you <> Gently open your eyes and let your eyes adjust to the light

Drawing: Now grab your paper and pencils and start drawing what you just imagined. Draw how the place looked like from above. Draw all elements you added to make yourself, other people and non-human beings feel comfortable.

Sharing: Now share the drawings in your group. Are the landscapes you drew very different? Are there any common elements that you drew? Is there any inspiration you can take with you for the actual design?

Appendix 3a: Morning exercises

1 Walk around in your neighbourhood and answer the question: does it actually support people and other living beings in their life?
2 Walk around the neighbourhood, where do you see opportunities to grow food?
3 Which animals live in your surroundings? Imagine you are a goat or chicken, how would you experience this place?
4 How does your neighbourhood affect the interactions of people? Does it stimulate community? Why (not)? What could help?
5 Go to a tree, stand next to it. How do you feel? Go to a shrub, do the same. How do you feel? Go to a person, same. How do you feel?
6 Walk around in your neighbourhood, observe the bark of different trees; why are they so different? What could be the reason for that?
7 Go for a little walk and see if you can find a nice spot in your home area, a place that is not far from your house and is kind of interesting to sit and observe. Sit there for a while and relax your mind for the exam. What sounds can you hear?
8 For this exercise, go to the sit spot that you picked on the day of the exam. If you didn't manage to, just pick one today. Find a place close to your house that you can easily walk to, where you can sit for a bit. It is nice if there are some things to observe, especially living things. If you are surrounded by buildings, that's okee too. Find an interesting spot that appeals to you. **I Wonder** . . . with your attention on what is around you, say to yourself, 'I wonder ... ' I wonder why lichen is growing on that side of the tree, only? Don't worry about answering your questions; just notice what questions you can generate. As much as possible, keep your questions focused on physical reality.
9 Observing Energy Ask yourself, 'How is energy coming into this system? How is it being exchanged?' There are many different sorts of energy you might observe: sunlight, heat, energy generated by motion of air or water, food, even psychic energy (but take time to focus on the physical before you jump to the psychic.) Also, you might try sketching your spot, or a plant in it, purely as a pattern of light and

shadow. Don't worry about producing a 'good' drawing; just let it become a meditation on how light energy is intercepted by form.

10 Observing Flow

In your home base, observe flows of all kinds. How does water move through this system? How do wind and airflow affect the area? What intercepts the flows? What marks do they leave on their passage? What is the source of these flows? How is that source replenished?

11 Observing Communities

What is growing together with what in this area? Which trees with which bushes, which groundcovers? Are there patterns you can discern? What insects, birds, and animals seem to be connected with what plants? Are some plants serving as 'nurses' for the young of others? Do some plants seem to stay distant from each other? Are some plants always found together? (Note: such questions can generally be answered only by many observations over time.

12 Observing Patterns

What patterns can you see there in your spot? Textures, patterns of growth, distribution patterns, stress marks, all are examples of patterns. What patterns are repeated, on what scales? Can you find spirals? Pentacles? Branching patterns? Patterns based in fours or sixes? How many times does a tree branch from twig to trunk? What functions might these patterns serve? Why are certain patterns repeated over and over again in nature?

Again, you might wish to take a session to draw patterns or forms. Put your thoughts on paper without worrying about producing a work of art, but simply as a meditation to sharpen your ability to see and focus.

13 Observing Edges

Where does one system meet another in your spot? As we saw earlier, edges — places where forest meets meadow, or ocean meets shore — are often the most diverse and fertile parts of an ecosystem. Is that true here? How does the edge differ from the centre?

14 Observing Limits

What limits growth here in your spot? Shade? Lack of water? Soil fertility? Other factors? How do these limiting factors make themselves evident? What is succeeding in spite of these factors? What seems held back? How have the plants and animals adapted to these limitations? What characteristics do the successful adapters have in common?

15 Observing from Stillness

Just sit still in your spot for at least fifteen minutes — longer is better. Notice what you can see, and how that changes over time.

16 What can you observe in this spot that can tell you about its past history, and how it might have changed over time? What can you observe that tells you something about the future of this place?"

17 How would you redesign the place that you have been visiting based on what you learned?

18 Today is the poster market and celebration of your work. Think of your team mates, you probably got to know each other's up and down sides. Write a little note for each of your group mates with what you appreciated about them, what you think is their personal quality. It can be something small!

19 Go for a walk and imagine what you would like to do with what you learned in the course. Did it inspire you in any way?

20 Go to your spot that you have been visiting. How does it feel now to be there? Take some time to reflect on this course and the morning exercises. Did you like it? Did it give you something? Is there something you are grateful for? Is there something you are unsatisfied about? You can say goodbye to your spot if you're not going to return.

Appendix 3b: **Home reflection assignments**

In this course we have included some exercises that stimulate reflection on your relationship to the living world. This is based on the head, heart and hands approach that we include in this course. Permaculture and ecological design can be approached as a merely technical skill of designing efficient, nature based ways of living. However, when one starts to interact with the landscape and other beings in direct ways, one has to make constant decisions that involve ethics. For this reason, peoples around the world that lived and live in close relationship to the natural environment have cosmologies and elaborate ethical systems that shape the relationships they have with one another and the wider life community. In modern life, these traditional ways have been or are increasingly replaced by economic relationships. Although many people have their personal ethics when it comes to food for example. Throughout this course, we will invite you to reflect on your worldview and explore the ethics of interacting with the living environment. Many assignments are inspired by indigenous ways of learning, which can help us to question common western assumptions and explore some new ideas.

Every morning before coming to class you will be given a small exercise. This is meant to wake you up for the day and start your thinking in a playful manner. The exercises will usually ask you to take a little walk and observer something. You can share your experience in the forum on Brightspace. You can be honest!

We also composed 3 small home assignments that you can complete at your own pace throughout the course. They are mostly meant for you to make your learning more interesting and to stimulate your personal development in relation to sustainability issues. We would advise to do one every week. Some of them require reading that is provided. You can write down your reflections on these assignments in this file. Some of them might be quite experimental for you. Do not worry, if it does not work for you that's fine. You can also write about that in your responses. This journal needs to be completed and handed on the last day of the course.

We also advise to note down some personal reflections regularly in this journal to support your learning process. This will lead up to a final reflection moment at the end of the course in which you are asked to integrate the various experiences of the course. This is graded with a pass/fail, you just need to demonstrate that you have reflected on the course to pass, this journal will help you do that. This journal can be printed or handwritten and may be brought along with you when you write the final assignment on the last day of the course. The reflections are reviewed to gain insight into your learning processes and to improve the course.

For questions contact louise.vanderstok@wur.nl

Good luck and enjoy!

Home assignment 1: Braiding Sweetgrass

For this home assignment we would like you to read three chapters from the book Braiding Sweetgrass by Robin Wall Kimmerer. She is a professor in botany and also a descendent of the Anishinaabe people, an indigenous lineage from North America. She brings these two worlds together; indigenous wisdom and modern science. Kimmerer herself forms the third strand in the braid, the ones who weaves the two cultural perspective "*It is an intertwining of science, spirit and story – old stories and new ones that can be medicine for our broken relationship with earth, a pharmacopoeia of healing stories that allow us to imagine a different relationship in which people and land are good medicine for each other.*" (Kimmerer, 2013: x)

The aim of this assignment is to reflect on Western culture and how it plays a role in our sustainability crisis. At the moment, our society is facing many urgent sustainability issues – while most people continue to consume resources at high rate and take little care of the environment. Some argue that the fundamental problem lies in the Western worldview – where humans are seen as separate from and often more important than nature. These stories invite us to reflect on this viewpoint and consider our personal relationship to the living world.

We have selected three chapters for you to read. We hope you will enjoy them! In case you would like to listen to them instead of reading – you can get a free subscription to Storytel for 14 days. This is highly recommended, because the stories are beautifully told by Kimmerer herself.

Chapters: Skywoman falling - The three sisters - Honourable Harvest

Please reflect on the following questions in your reflection journal

> Feel free to make a drawing/poem/other creative expression if you like. For practical purposes, please do not write more than 400 words per question.

How is it for you to read these stories? What triggered you or touched you?

Does it affect in your view of the living world?

Does it stimulate you to make different decisions in your life?

How is this relevant for permaculture?

Home Assignment 2 – Plant exercise

Meeting with a plant

In the Western world we are used to observe only the physical reality around us. Since the Enlightenment period, Western science and philosophy have understood the world as mechanical, consisting of moving, interacting parts. However, in most cultures around the world people also experience more implicit, energetic level of reality. The world can be experienced in a physical way, but also through our emotions and intuition. In many parts of the world, nature is considered sacred and imbued with Life force or a living energy. Even in Europe, up until the 17th century this was a common way of perceiving our surroundings. People held worldviews similar to ones of many indigenous peoples elsewhere in the world, of *"an ultimate unity and a reciprocal penetration of nature and mankind, organically organised with each other and interactive,..., i.e. direct participation in the cosmos. People assume that they can have immediately magical influence on the world"* (Gurevitch quoted in Knippenberg, 2010:34). Key understandings of life to these peoples was spiritual, based on interrelationship and complementarity. All has life and is interlinked (ibid).

The image below represents a view of plants that is quite common among indigenous traditions. Plants are considered medicine; not only because they have certain chemical compounds which have beneficial effects in our body, but also in other ways. Each plant (or animal/element) has a certain wisdom you could say – something to tell. Through regular interactions or ritual one can get to know this wisdom. You can experience this wisdom in different ways: physical, emotional, cognitive or spiritual. In this exercise we would like to you to explore this for yourself by doing the following:

-        Go for a walk, take paper and pencil with you and choose a plant, shrub or tree in your personal environment

-        Sit close to it. Relax, forget everything that occupies your mind, close your eyes for a minute and then open your eyes and observe your plant for 10 minutes. Now turn around and try to draw it from memory, you are not allowed to look!
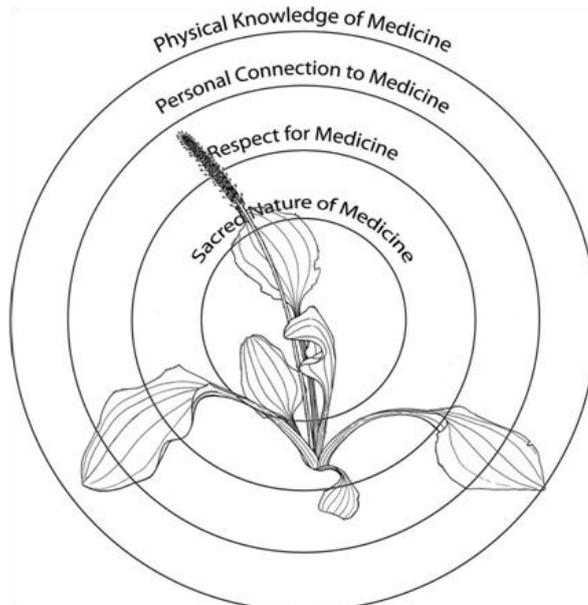
-        After some minutes, look at the plant again and try to remember the parts you forgot. Turn around again and adjust your drawing or make a new one if necessary.

-        Is it correct now? You can have one last chance of looking! and then draw your final impression. What did you notice?

-        Now close your eyes again and sit with the plant for bit. Notice your mood or sensations. Picture the plant in your imagination and then ask: what can you help me with? See if you get some answer. This can be a thought, image or a sensation in your body. If nothing happens, open your eyes and touch the plant. Ask again. See if you get some answer.

-        Reflect on your observations in your Reflection journal. What do you experience? What does that mean for you? If it doesn't work at all for you, that's fine. Please write about what you experience and why it doesn't work.

If you are interested to explore more, you can investigate the medicinal qualities of your plant. Do you know which species your plant belongs to? You can explore more in literature. You can look up legends and stories about the plant, which often reveal its medicinal and cultural values.

Home Assignment 3

Take the perspective of another being

During this course you are working on the design of a regenerative system, which is intended to serve the livelihood of your client as well as the wellbeing of the landscape and its non-human inhabitants. From the start of the design exercise, you have been asked to empathise with the needs and wishes of the land – the soil, the animals and plant communities – and to create a design in which they produce mutual benefits. You have done an exercise in the field to 'listen' to the surroundings and feel into the needs of the landscape. Now you have made a sketch design, and it is time to check whether that design will benefit the land and its inhabitants.

In this exercise, you are asked to take the perspective of an animal, plant (community) or element (soil or water) in the landscape you are designing. It may be strange to take the perspective of an element such as water. However, this has been quite common among indigenous peoples around the world. In New Zealand there is a river which has been given the legal status of a person (https://www.nationalgeographic.com/culture/graphics/maori-river-in-new-zealand-is-a-legal-person). Also other elements, such as mountains or forests have been given legal rights. It is a common practice among many cultures to 'speak' with such elements in the landscape and to consider their integrity and wellbeing. Many indigenous languages even have a different way of addressing seas, mountains and rivers. In English, we use nouns for them, we see them as objects. In many other languages, people use something like a verb to address these elements: they are active beings living their own lives.

Robin Wall Kimmerer tells this story about her learning her ancestral language: "I remember paging through the Ojibwe dictionary she sent, trying to decipher the tiles... Pages blurred and my eyes settled on a word – a verb, of course: "to be a Saturday" *Pfft!* I threw down the book. Since when is Saturday a verb? Everyone knows it's a noun. I grabbed the dictionary and flipped more pages and all kinds of things seemed to be verbs: 'to be a hill," "to be red", to be long sandy stretch of beach,", and then my finger rested on *wiikwegamaa:* "to be a bay". "Ridiculous!" I ranted in my head. "There is no reason to make it so complicated. No wonder no one speaks this. A cumbersome language, impossible to learn, and more than that, it's all wrong. A bay is most definitely a person, place, or thing – a noun and not a verb." I was ready to give up. I'd learned a few words, done my duty to the language that was taken from my grandfather... And then I swear I heard the zap of synapses firing. An electric current sizzled down my arm and through my finger, and practically scorched the page where that one word lay. In that moment I could smell the water of the bay, watch it rock against the shore and hear it sift onto the sand. A bay is a noun only if water is *dead*. When *bay* is a noun, it is defined by humans, trapped between its shores and contained by the word. But the verb *wiikwegamaa* – to *be* a bay – releases the water from bondage and lets it live. "To be a bay" holds the wonder that, for this moment, the living water has decided to shelter itself between these shores, conversing with cedar roots and a flock of baby mergansers. Because it could do otherwise – become a stream or an ocean or a waterfall, and there are verbs for that, too. To be a hill, to be a sandy beach, to be Saturday, all are possible verbs in a world where everything is alive. Water, land, and even a day, the language a mirror for seeing the animacy of the world, the life that pulses through all things, through pines and nuthatches and mushrooms. *This* is the language I hear in the woods; this is the language that lets us speak of what wells up all around us." (Kimmerer, 2013: 54-55).

Exercise:

What being comes to your mind that you like to get to know better? Choose one. Imagine you are this being, take time to feel into it. Imagine the place you have visited and how this being lives there. How does it feel to be your being? What do you look like? Do you move a lot or stand still? Can you feel heat, cold, movement or wind? What are your daily needs? (Where) do you sleep, eat, drink? Do you have cycles of growth and decay? How do you experience stress and pain? How do you experience wellbeing? Think of the design you have made. What will your life be like in this design? Imagine a day of that being in the

system you have designed. Imagine a year in that system. Or a decade. Will it help you to live and prosper?

Write down what you experience from the perspective of the being you choose. Write it like you are that being. For example say: I move here and here, I feel this and this... and so on.

Please include some reflection about this exercise in your design report.

References:

Kimmerer, R. W. (2013) *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants.* Milkweed Editions

Knippenberg, L. (2010) Chasing God: The idea of sustainable development and its implications. In Wijsen, F. & Marcos, S. (eds.) *Indigenous Voices in the Sustainability Discourse: Spirituality and the struggle for a better quality of life.* Nijmegen Studies in Development and Cultural Change. Vol. 49: 31-48

Appendix 4a: Content exam 2021

Name:.........   **Registration number:....................................**

Content Exam ED&PC 2021

May 18; 9.00 to 13.00 hours

 Please answer questions 1 to 5.

In brackets the number of points you can score for the questions,

This exam counts for 30% of your overall mark. You have to score more than 5.6 to pass this course

Answer each sub-question in not more than 125 words, except question 4: you may used 250 words.

Read first all 5 questions before you start.

 You are allowed to use all your lecture notes and all Bright Space documents and internet, but....

I ....(put your name or signature) hereby promise that during this exam I do not discuss or chat with my fellow students or other people through any digital means!

We will assess your answers on:

- is your answer consistent?

- do you include/apply a system thinking-approach?

- do you use references for your statements? (just put names of researchers or the title of an article, or 'slide x in the presentation of....' or the name of a guestspeaker ofr farmer. Do not worry about the right notation of the reference!

- Is your answer to the point and without irrelevant information?

- Is your answer creative?

Submit your exam on BS before 13.00 hours.

Before you submit your exam check if there is a message in your mailbox concerning the exam

The zoom session is also open during the exam to make it easy for you to contact us during the exam for any clarification or question.

The Questions:

1. Design Principles (10-10-5 points) (based on a question formulated by Rianne) 125 word for each sub-question

You have seen the documentary the Biggest Little Farm. We visited (online) the fruit-chicken farm of Wil Sturkenboom and the Food Forest of Wouter van Eck. Besides that we had a short visit to the Droevendaal Food Forest and the bike tour to a sandy and a clay landscape and you visited a farmer who put you on some practical job. So you have visited 7 farms/landscapes up to now.

Describe:
   a. 5 examples of PC-design principle 10: Edges which you have seen in these 7 farms/landscapes. Explain also the pro's and cons of these edges for the farmer.
   b. 5 examples of PC-design principle 9: Guilds which you have seen in these 7 farms/landscapes. Explain also how the elements in these guilds are supporting each other.
   c. Which design principle is your favourite one? Why?

2. Animals (10-15) 125 words for each sub-question

This graph was shown in the lecture Permaculture and Animals:

TABLE 2   Global anthropomass and zoomass of wild and domesticated animals, 1900 and 2000 (Mt C)

Year	Humans	Wild terrestrial mammals	Elephants	Domesticated animals	Cattle
1900	13	10	3.0	35	23
2000	55	5	0.3	120	80

NOTE: Estimates shown are the best approximations of global totals; those for the anthropomass and the zoomass of domesticated animals and cattle in 2000 are relatively the most accurate.

A topic of public debate in the Netherlands is that the livestock biomass should be reduced by 50%. Simultaneously Ichsani (in her lecture about Nutrient cycles) described during her lecture that in prehistoric times there were 10 times more megafauna on earth.

The cultivation of domesticated animals has skyrocketed since 1900, while the abundance and richness of wild megafauna has decreased since 5000 before present.
a.   Explain how you envision the role of megafauna in solving the issues of our time and how this

role can be pursued.

b.   Justify your answer with at least 3 arguments. Each argument should be related to 1 of the 3

        permaculture ethics and 1 of the 3 lectures of Kees on the Intrinsic characteristics of
        animals, Ichsani on Nutrient cycling and Jordy and Louise on Succession and
        Disturbance. All lectures and ethics should be represented in at least 1 of your
        arguments.

3. Eco-literacy (5-20) 125 words for each sub-question

a. What is your definition of Ecoliteracy?

b. Which elements/concepts/ideas did you hear back from your definition in the lectures/presentations of yesterday (Ecoliteracy by Kees, Genius Loci of Gabrielle Bartelse and the exercise on the Sense of Place by Reineke)?

4. Designing (5 each) (based on an idea of Lise) 250 words

Is the farm of Wil Sturkenboom a real Permaculture farm? Give 5 sound reasons why it is a Permaculture farm or why not.

5. Personal growth (6.25 points each) 125 words for each sub-question

We 'hammer' a lot on the connection between Knowledge (Head), Attitude (Heart) and Practice (Hands) to achieve a sustainable livelihood.

        a.   Do you agree that this connection is a prerequisite for a sustained future? Why or
        why not?
        b.   How do you see the connection between a scientific attitude and a more intuitive
        attitude? Are they conflicting or are they supporting each other? How and Why?
        c.   The coming weeks you are going to (re)-design a (farm)-plot of land. What is your
        strong point in which you can take the lead in this process,
        d.   and what is your weak point for which you need the support of your fellow-
        designers?

 Enjoy!

Kees van Veluw

17-5-21

Appendix 4b: Reflection exam 2021

This reflection exam consists of two parts: a content reflection and personal reflection. The first part is graded and deals with the content of the course. The second part is not graded, but you need to do it in order to pass. The second part is about your personal learning journey in this course. During this course we have experimented with a different approach to learning than what is usual in university. We have tried to integrate the head, hart and hands and also created a learning environment where you are stimulated to develop your own viewpoints and values, and apply them to a real-life case study.

Louise (student-assistent) is researching the effects of this approach to learning and would like to gather your reflections for the research. Louise would also like to look into the content exams and whatsapp group to gain more insight in the learning process. The reflection and content exams will be made anonymous. The whatsapp group cannot, but Louise will keep your information confidential.

Please indicate if it is ok for you if Louise looks at the:

content exam: yes/no

reflection exam: yes/no

whatsapp group: yes/no

Mail your answers at 16.30 hours today to me: kees.vanveluw@wur.nl

Be sure you put your name and add page numbers in the word/pdf document.

Put in the subject box: 'Your Name' and 'reflection exam PC'

PART 1: REFLECTION ON THE CONTENT

 Support as much as possible your reflection with scientific arguments / reasons / proof / experiences / drawings / pictures in and from this course! This exam counts for 30% of your overall mark.

I hereby promise that during this exam I do not discuss or chat with my fellow students through any digital mean!

Please answer all questions (Between bracket the maximal score for each question)

These are essay questions with room for elaboration using references, drawings etc.; answer each (sub) question with maximum 250 words!

I will assess your 5 short essays on the following indicators:

- is it a consistent and scientific story?

- do you have relevant/sound arguments to support your reflection?

- do you use examples (from the course) to explain your reflection?

- do you use (scientific) references to support your statements/reflection

- have you used pictures, graphs, illustrations, schemes etc. that explain your reflection?

PLEASE ALSO FILL IN THE DIGITAL COURSE EVALUATION WHICH HAS BEEN SENT TO YOU TODAY!

 If you have questions during the exam: mail me! I am fully stand by!

I also have opened the usual zoom link so you meet me there!

QUESTIONS:

 1. Assessment of your own design (20 points)

Take your own design in your mind. Is your design sustainable?

Hint: give first your definition of sustainability and after that assess if your design is sustainable. Give sound arguments and examples that support your assessment

 2. Assessment of Permaculture design (20 points)

In the first part of the course you have been introduced to permaculture concepts and practices through the eyes of the teachers and practitioners. In the second part of the course you have had

your own experience with a real design case. What did you experience as weak points of Permaculture as a design method in practice? What can be done to overcome these weak points?

3.Assessment of Permaculture as a way of life (20 points)

In the first week of the course you have heard various (sometimes contradicting) perspectives on the role of permaculture and food forests for social-economic, ecological and spiritual regeneration. What is your viewpoint on this now after taking the course? Please reflect on the social-economic, ecological and spiritual aspects.

PART 2: REFLECTION ON YOUR PERSONAL LEARNING JOURNEY

Background

1. What is your study program?

2. How far are you in your study?

3. We find ourselves amidst a global climate and biodiversity crisis. Could you explain how this is affecting your personal life?

4. What motivated you to participate in this course?

Learning experience

5. How did you experience this course overall? And what has contributed to that overall experience?

6. Did you experience the way of learning in the course to be inspiring? If so, can you give some examples of course elements that inspired or did not inspire you and why?

7. In this course knowledge was not only gained in a cognitive way, but for a large part also by doing or feeling/observing/experiencing. Do you feel that through the course work you came to experience knowledge in a different way? If so, could you explain how some course elements made you gain/experience knowledge in a different way and how that affected you?

10. Were there any elements in this course that made you feel your sensitivity towards the world around you changed? If so, can you describe your experience by giving some examples of course elements that affected your sensitivity towards the world and how?

8. Permaculture is not only a technical design method, it also contains a strong ethic of earth care, people care and fare share and is based in a perspective on life that emphasizes interconnectedness. Do you experience that something has changed in your own worldview throughout this course? If so, could you explain which course elements affected your worldview and how?

9.   Did you experience internal conflict (friction, resistance) with viewpoints or methods in the course (maybe compared to what you're used to)? If so, can you give some examples of course elements that elicited such conflict within yourself and could you try to explain why this resistance was there and how you dealt with that?

9.   How did you experience the learning community in this course? Please elaborate on how you felt in relation to teachers, assistants and other students.

12. Did the course offer you any valuable insights for your personal way of living? Did it change something in how you would like to live?

13. Could you explain whether and how this course contributed to your sense of self confidence or esteem in relation to societal challenges such to the natural world? Can you explain what elements in the course contributed to this (if any)?[TA7]

14. Did this course contribute in any way to your (dis)trust regarding we as humanity or yourself as an individual can address the climate/biodiversity crisis we find ourselves in? [TA8]

15. Are there any other things the course brought you that you'd like to elaborate on?