REA RAUS

Teacher Ecological Self

Negotiating teacher ecological identity in the context of teacher education for sustainable development

■

UNIVERSITY OF TAMPERE

REA RAUS

Teacher Ecological Self

Negotiating teacher ecological identity in the context of teacher education for sustainable development

Cover design by
Mikko Reinikka

To: Hillar and Edda-Alice

ACKNOWLEDGMENTS

ABSTRACT

The dissertation addresses the paramount sustainability crisis we face today, through the field of education and teacher ecological identity development, in particular. Drawing on the deep ecology approach and a holistic view of education, the dissertation discusses the notion of the ecological self of a teacher, who is seen as an agent in the transformation processes for sustainability. While many authors suggest that working with student teachers' selves should be central to teacher education programmes for sustainability, the question of what kind of self we should aim at becomes of particular interest. In the ontological quest for searching for an answer, deep ecology was taken as a conceptual framework for the study focusing on the construct of an ecological self of a teacher. The longitudinal, 4-year study followed the development of 9 student teachers during a particular teacher education programme, focusing on their emerging ecological selves. The results suggest the value of targeted professional discussions about becoming and being a teacher in the context of sustainable development and the role of connecting to nature in the process of the development of teacher candidates' ecological selves.

Keywords: ecological self, teacher identity, sustainable development, teacher education

TIIVISTELMA

Väitöskirjassa tarkastellan elinympäristömme vakavaa kestävyys- ja selviytymiskriisiä kasvatuksen ja koulutuksen näkökulmasta ja erityisesti opettajan ekologisen tietoisuuden ja identiteetin muotoutumisen haasteena. Laajentaessaan perinteistä kokonaisvaltaista kasvatus- ja koulutusnäkemysta ns. syväekologisella näkökulmalla väitöskirja pyrkii käsittellisesti hahmottamaan opettajan ammatillis-ekologista minuuspositiota ja sen keskeistä roolia kestävän kehityksen koulutuksellisessa edistämisessä. Monien tutkijoiden korostama yhteistyöskentely opettajaopiskelijoiden kesken ja kanssa ekologisten identiteettipositioiden hahmottamisessa on väitöskirjassa lähtökohtana täsmällisempien identiteettitavoitteiden ja prosessien kartoittamiseksi. Väitöskirjan lähtökohdat fundamentaalisina oman aikamme ontologisina kysymyksinä perustelevat syväekologisen lähestymistavan omaksumista ekologisen opettajauuden kehittymistä käsittelevän tutkimusen viitekehyksenä. Nelivuotisen pitkittäistutkimuksen aikana seurattiin yhdeksän opettajaopiskelijan ekologisen tietoisuuden kehittymistä osana heidän opintojaan. Tulokset nostavat esiin kestävän kehityksen avainkysymyksiin keskittyvän pedagogisen keskustelun ja kommunikaation arvon ja tärkeyden pyrittäessä kehittämään opettajaopiskelijoiden ekologista tietoisuutta osana heidän ammatillista identiteettiään.

.

TABLE OF CONTENTS

LIST OF ORIGINAL PUBLICATIONS

This dissertation is composed of a summary and the following original publications, reproduced here by permission.

I.
Raus,R., Falkenberg, T. (2014). The Journey towards A Teacher Ecological Self: A Case Study of a Student Teacher. *Journal of Teacher Education for Sustainability,* 16(2), 103-114.

II.
Raus, R., Värri, V.-M. (2017). *Teacher Ecological Self-An Ontological Journey.* In: Envisioning Futures for environmental and sustainability education. Eds: Corcoran, P.B., Weakland, J.P., Wals, A.E.J. ,Wageningen Academic Publishers.

III.
Raus, R. (2016). Modelling a Learning Journey towards Teacher Ecological Self. *Journal of Teacher Education for Sustainability,* 18(2), 27-38.

IV.
Raus, R. (2017). Student Teacher Ecological Self in the context of Education for Sustainable Development- A Longitudinal Case Study.(in press, Journal of Education for Sustainable Development)

1 INTRODUCTION

Starting with Rachel Carson's *Silent Spring* (1962), the report *Limits to Growth* by the Club of Rome (Meadows et al., 1972) and the United Nations Conference on Human Development (UNEP 1972), which focused on environmental education, we have come to initiatives like the Global Action Programme on Education for Sustainable Development, which was endorsed by 37th General conference of UNESCO (2014) and to a more determined and co-operative initiatives by educationalists, scholars and teachers from all over the world. Truly, education for sustainable development has become one key component in the development and innovation of our societies for a more sustainable future.

Countless authors (e.g. Orr, 1994; Macy et al., 1998/2013; Macy, 2007; Drengson & Inoue, 1995; Jones et al., 2010; Weinstein & Turner, 2012; Hopkins, 2011; Tudge, 2007; Bowers, 1995; Harding, 2013) who have studied the sustainability crisis we are facing nowadays see the root cause of this problem in our dominant value systems, our worldviews and our separation from Nature. They stress the importance of the field of education in the forthcoming transformation for sustainable societies.

The present dissertation sets the aim to investigate and identify how this root cause can be addressed in teacher education (TE) programmes in the context of education for sustainable development (ESD). While relying on many authors (e.g. Babiuk & Falkenberg, 2010) who suggest that working with teacher candidates' selves should be central to teacher education programmes, the question of what kind of self should we aim at becomes of particular interest.

In the ontological quest for looking for the answer, deep ecology was taken as a conceptual framework for the study focusing on the construct of an ecological self of a teacher (research papers I and II of the present dissertation).

The longitudinal, 4-year study was initiated to follow the development of 9 student teachers' selves during a particular teacher education programme (research papers I and IV of the present dissertation).The main aims of the research were to:

a) investigate the need to transform teacher education to become the driver of transformation for sustainable development and the role of a teacher self thereof;

b) identify dimensions of evolving student teachers' ecological identities in the context of TE for ESD;

c) make recommendations for student teachers, practicing teachers, teacher educators and curriculum designers based on research findings.

Following the timeline of the study, modelling the learning journey for the ecological self was attempted (research paper III) where working with teacher candidates' selves during the longitudinal study was aimed at as an intervention (research paper IV).

The results of the the study together with the theoretical underpinnings revealed a discussion that revolves around the deeper meaning of education and human life as such. Education, as the process of *educare,* revealing something from within that speaks to our greater being in the world, gives also meaning to the process of being and becoming a teacher, a moral compass in the times of transformation for more sustainable societies and for more sustainable, ecological self for that matter.

2   SUSTAINABILITY CHALLENGE IN TEACHER EDUCATION

2.1   Sustainability Crisis as an Educational Problem

The future of humanity and the Earth depends on whether humans understand how to commune with the natural world rather than exploit it; on whether they develop their capacity for intimacy in human-Earth relations.(Verhagen, 2010)

During the past two centuries, and especially during the last five decades, the global economy has shown incredible growth, transforming the character of the planet and especially of human life. Through industrialization and globalization, the standard of living in the developed world has soared from bare subsistence to affluence, while the majority of people in the developing world still are subjected to destitution (Mebratu, 1998, p. 496). Ehrenfeld (2005, p. 23), like many others, calls for more urgent action, e.g. in the field of economic thinking, stating bluntly that the root of this (sustainability) problem is neither businesses' misunderstanding of what is at stake nor corporate cynicism about the sustainability cause, but the problem that is rooted in managements' failure to see unsustainability as a systems' failure and to acknowledge the extent to which radical thinking and action are required to embark upon a sustainable trajectory (ibid., p. 23). He, similarly to a myriad of autors including e.g. Fritjof Capra, Stephen Sterling, David Orr, Arjen Wals, sees the core problem in our addiction to consumption and technological modernity. Ehrenfeld (2005) warns that as such unsustainability is a systemic failure and should be attacked on a very fundamental level (p. 24), it is not enough if we turn sustainability into one more additional, isolated subject or a field of study.

To give just one more illustration to widely discussed global sustainability problem, in 2016, Newbold et al. published results of a global research of biodiversity loss and found that land use and related pressures have reduced local biodiversity intactness beyond proposed planetary boundary across 58.1% of the world's land surface, where more than 70% of the human population lives. The authors of this review warn us that if we continue on our present course, we will undermine all our efforts towards long-term sustainability. We are literally destroying the land, our own living environment, under our feet. The same issue, the destruction of our own future, has been discussed by many authors also in the social sciences, and a multitude of strategical initiatives of global scale for sustainability have been undertaken already for decades. Facing the growing inequality and environment degradation, David Orr (1992:ix) bluntly states '...we have to admit that Western capitalism has failed, it produces too much and shares too little'. He adds, 'For would-be planet managers it should be a matter of no small consequence that God, Gaia, or Evolution was doing a job nicely until human population, technology and economies got out of control. This leads me to think that it is humans that need managing, not the planet...Planetary management appeals to our desire to be in control of things. It appeals to our fascination with digital readouts, computer printouts, dials, gauges and high tech of all sorts. Management is mechanical not organic, and we like mechanical things: they reinforce our belief that we are in control.'(pp. 157-158). By exercising such control and attempting to reshape nature, we seem not only designing our own destruction as species but we create a lot of unhappiness, pain and suffering for all other living beings on Earth. These arguments lead us to thinking that there might be something fundamentally tilted also in our educational systems, if we 'produce' highly educated people who successfully continue the destruction of our environment, focusing on innovative technologies and updated methods how to proceed in this manner merely in more efficient way. Capra & Luisi (2014) are convinced that there are solutions to the major problems but we must understand that all problems are interconnected and interdependent and we need a radical shift in our perceptions, our thinking, our values (page xi) that reconnect us to nature, our own selves in fact. Hence, we cannot be satisfied with cosmetic changes, instrumentalist approaches, changes of methods or technology in this global transformation, but we should first and foremost address the questions related to our being and meaning in the world, full of other living creatures and substances. The field of education and its central

figure- the teacher- carries a profound responsibility for such a change that investigates our relationship to nature and embraces the need for re-connection.

After the Scientific and Industrial Revolution our connection to nature has weakened drastically and our understanding of Mother Earth has gradually been replaced by understanding of Earth as a place, full of different living and non-living resources, meant for human exploitation. Even human beings themselves are objects for increasing exploitation and often seen merely as agents in the market of economy. Nature, environment and living beings have been separated from us, people, into fragments represented in certain fields of study or specialized discussion forums. Our technological progress and scientific discoveries do not walk the same pace with our sense of responsibility and care towards all living creatures, towards our own environment because too often we do not see or consider them as part of our everyday personal and professional lives. Hence, the problem is not only in our inadequate sense of empathy and responsibility, but also in our fragmented view on knowledge, science, economy, people, nature and life in general. Such a view has led us to biased behaviour and actions, based on only a part of information that is needed for decision-making and action for more sustainable and resilient societies. Looking at nature, natural processes, patterns, cycles and flows that have endured millions of years of evolution, would help us return to our true, sustainable path of living. That also means more holistic, ecological view on human development and personal growth which are overarching aims of any level of education.

2.2   The Concept and Definition of Sustainability

As words carry meaning and meaning creates understanding and reality, it is worth while looking more closely also to different definitions of "sustainability" since the literature from last decades gives different approaches and understandings of sustainability where the concept itself can create confusion. Mebratu points out, that strengthening the logical coherency within the concept by overcoming the influence of institutional and group interest is a prerequisite for developing our understanding of the concept and achieving a sustainable world (1998, p. 518). The vagueness of the World Commission on Environment and Development (WCED)

definition of sustainable development has led to multiple definitions and interpretations which carry different values, according to some authors (Orr, 1992; Fien & Tilbury, 2002) and can be basically categorised into two major groups. One approach is called „sustainable economic growth" and it emphasises the role of economic and technological means to move towards more sustainable economics as a key area of human societies. Natural environment is still regarded here as a source of resources, but to be managed with more care and responsibility, basically so that the resources for our consumption could last longer. The probably most well-known and frequently cited definition of this approach was stated by the Brundtland Report (World Commission on Environment and Development, WCED, 1987) as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'. The problem with this definition and hence the meaning is that it still focuses on *needs*, often equaling to our wishes, reinforcing the understanding that we have to find either new technologies or solutions to satisfy our needs (for goods and services) in the framework of further development of our economies and societies. According to it we are expected to see an external change, that would preferrably be brought along by more technology or other means that could sustain the life we are used to. The „sustainable human development" approach, a second one, demands more radical revision of our current systems. It questions our existing worldviews, that penetrate all human action and discusses our internal world, that needs to be changed or more likely, returned to. David Orr contrasts these two approaches stating that the first sees a solution to our sustainability crisis in more technology, more efficiency, more global technocracy, while the second looks at „rejuvenation of civic culture" and emphasises the importance of ecological literacy and competency among people (Orr, 1992, p.1). It is closer to the term "renaissance"- a"re-birth" of humanity, which we can see as evolution not only development or change which the first approach refers to. Mebratu (1998) also divides different sustainability concepts into two categories and says that within the disciplinary framework of ecology they may be categorized broadly into two domains: shallow ecology and deep ecology (Mebratu 1998). Shallow ecology basically means the treatment of environmental problems without tackling the underlying causes and without confronting the philosophical assumptions that underlie our current political and economic thinking (Clarke 1993). On the other hand, we find the concept of deep ecology formulated by the Norwegian

philosopher, Arne Naess, in the early 1970s as a response to the limits of shallow ecology. His view was that, in the long run, environmental reforms of social and economic systems are not a viable solution to offset the accelerating destruction of the environment. Warning that the ecological crisis threatens the survival of humanity, Arne Naess identified the deeper roots of the crisis in Western culture and in particular in the cultural values legitimizing the domination of nature (Braidotti et al. 1994). Seeking to overturn the epistemological foundations of Western culture, deep ecologists propose to replace anthropocentric hierarchies with biocentric egalitarianism. This dictochomy between two approaches towards sustainability can also be seen as a clash between an instrumental, mechanical view versus holistic, ecological view on the world and sustainability, as Stephen Sterling (2011) has described it. Yet, sustainability has also been viewed as a bridging concept between existing, Western approach towards environment and development and a new, emerging ecological paradigm. Wals & Jickling (2002, pp. 221-222) bring into the discussion the limitations of the whole concept of „sustainability", warning that the idea of sustainability is conceptually flawed, as word-by-word it means going on continuously in the same way. As they see, it masks the whole epistemological layer and provides no clues how to mediate between incompatible value systems. Although there are different definitions and understandings of the term sustainability, we should not forget the core and the meaning of this notion and should not let ourselves be distracted into an everlasting debate over definitions while the world is crumbling around us. According to Fien &Tilbury (2002) „…from this perspective those that argue that sustainable development is too ambiguous a concept upon which to base public and educational policy have missed the importance of sustainable development as a way of transcending conflicting worldviews"(p.4).

Naming the concept may make things clearer but at the same time dogmatic or, according to Wals &Jickling (2002), the ambivalent nature of the concept of sustainability can be a major conceptual impediment to those who like to work with crisp and clear, narrowly defined concepts: `Tell me what it is and I'll teach it!'. It should also be realized, however, that this vagueness has an enormous canvassing and heuristic capacity if it is systematically and systemically used as a starting point or operational device to exchange views and ideas (p. 226-227). The vagueness and ambiguity of the definition is also discussed by Robert Engelmann

in *Beyond Sustainababble* (State of the World, 2013, p. 5). According to Engelmann, the overused and misunderstood adjective „sustainable" should be approached with a deeper meaning. He is worried that during recent years the meaning has morphed into something like "a little better for the environment than the alternative" (p. 5). To alter critical and alarming trends in our environmental decay, larger changes are needed than we have seen so far, as he says, 'We desperately need—and are running out of time— to learn how to shift direction toward safety for ourselves, our descendants, and the other species that are our only known companions in the universe. And while we take on these hard tasks, we also need to prepare the social sphere for a future that may well offer hardships and challenges unlike any that human beings have previously experienced.While it is a subset of the biosphere, the social sphere is shaped as well by human capacities with few known limits' (p. 5).

Sustainability as a concept can carry also blurring meaning for different value systems. Although we can discuss sustainability as a bridging concept between different views on environment and society, we must be aware not to step into a simplification of different concepts. When comparing the sustaining of ecological processes with the sustaining of consumerism we immediately see inconsistencies and incompatibilities of values, yet many people, conditioned to think that sustainability is inherently good, will promote both at the same time (Wals & Jickling, 2002, p. 223). Wals & Jickling also draw an example from Orwell`s book *1984*, where antagonistic concepts can be conjoined in a single phrase (`war is peace',`peace is war') or concept (i.e. `sustainable growth').

Therefore, it might be useful to look at the concept of sustainability as a frame of mind. Bonnet (2002) states that the idea of sustainability should become not only a policy but also a frame of mind, if we want to transform our societies towards more resilient and sustainable. He points out two main reasons for it. First, sustainable development as a policy is subject to severe epistemological difficulties. The second reason connects it to the core aim of education, which must include a frame of mind that involves an idea of a right relationship with nature. As he says, focusing on a „nature-orientated" frame of mind offers the possibility of both contributing to the clarification of sustainable development as an idea and to the identification of something which is of great educational

importance in its own right, for in many ways our underlying relationship with nature defines both ourselves and our relationship with the world as a whole (Bonnet, 2002). He points out key features of sustainability as a frame of mind:

a) A receptive-responsive openness to, and concern for, nature.

b) A worldview that is neither purely anthropocentric nor bio-centric in essence; it recognizes that the non-human (as well as the human) only shows up in the context of human concerns and practices; nature is thus human-related but neither human-authored nor at human disposal.

c) Sustainability as a frame of mind is not a bolt-on option but an integral element of authentic human awareness; clearly, this is quite a different sense of sustainability than that which seeks to sustain the use of resources that may be required for some further development (such as economic growth).

d) The development of such a frame of mind will require, a radical re-evaluation and re-positioning of the calculative motives and understandings that dominate modern Western consciousness and society.

Bonnet (2002) even suggests that for the development of this new frame of mind, for a turn in our frame of mind, a different metaphysics is needed. Some authors see this Great Turning (Macy 2007, Macy et al, 2013) rooted in Eastern traditions that have influenced also the work of Norwegian philosopher, Arne Naess, the founder of deep ecology who coined the notion of ecological self.

Still, we should be careful in going into a deeper debate about the correct definition that would according to some authors result in „paralysis by analysis" and in delays in key changes essential for a more sustainable society (Fien & Tilbury, 2002, p. 3). For example, Bergmann et al. (2012) draw attention to the transdisciplinary nature of sustainability as a concept, thus resulting in different interpretations by scientists from different disciplines. Every scientist is „socialized" into the terminology and conceptual framework of his or her discipline (Bergmann et al., 2012, p. 54), hence contributing to further challenge to find a common understanding of sustainability. Keeping in mind the general aim -

solving rapidly deepening problems humanity and our ecosystems are currently facing - would help to find the way through the maze of definitions and concepts. So, using the term „sustainability" we could see it as a general approach to all human thinking, behaviour and action, that contributes to human existence in balance with nature, which in turn is in balance with our deeper, ecological, natural selves contributing to our own, personal well-being as well as to the collective well-being of the entire planet.

Therefore, we should be careful in incorporating the term in our everyday activities in a way that we no longer see the forest behind trees and try to understand the evolution of the notion of ESD. In the context of the present dissertation a term Teacher Education for Sustainable Development is used due to its widespread use and also because the dissertation does not specifically address the debate over different definitions and terms. At the same time Wals' and Jickling's argument is extremely valueable to remind us of the danger of articulating contradicting ideas and concepts. This debate should be addressed specifically in relevant discussions

2.3   Education for Sustainability/Sustainable Development

2.3.1   Mechanistic vs. Ecological, Holistic Worldview

Education as a field itself is diverse and vast and is deeply rooted in different paradigms and different views on life. As previously discussed, the world is currently facing a sustainability crisis and the root problems lie in our value systems, coupled with a lack of imagination and creativity (Wals & Corcoran, 2012, p. 26) as well as in worldviews. In fact, we can say that all unsustainable systems have been created by well-educated people, who were definitely taught certain values. The problem with the contemporary educational establishment is not that values are being ignored. Education is surely teaching values both explicitly and implicitly. The problem is that it is teaching the worldview and values of the

scientific/technological society (Ireland, 2007, p. 18) and as such re-enforcing a radical mechanistic view of the world.

We might start unwinding the problem looking at different views that have influenced our human thought, behaviour and action, namely mechanistic and holistic, ecological views (Sterling, 2001) since they form the basis of our educational choices as well. Fragmented, mechanistic and industrial society furthered utilitarian thinking that viewed humans as superior to all other life forms. Industrialization broke tasks and jobs into bits and pieces for more 'efficient' production. 'Knowledge' became associated with separate disciplines. (Ireland, 2007, p. 15). Specialization and technological advancement have been supported by the notion of relying on the experts who either come up with yet another 'technological fix' that supports our unsustainable lifestyle (Orr, 1991) or who possess a particular specialized knowledge that give them the ability to act (Ireland, 2007,p. 16). Such a mechanistic worldview (e.g. Capra 1982, Sterling 2001/2011, Harding 2013, Olsen et al, 2000) is usually illustrated by the Cartesian example. In Fritjof Capra`s (1982) writings (see also Capra & Luisi, 2014), Descartes is discussed as one of the greatest minds of our age, but also the one who showed that the mind and matter were two different things. This separation, fragmentated and hierarchical worldview has had a major influence on our thinking and action, also in the field of science and education. Lifeless particles forming objects, which have more or less value according to human needs- this has been the dominating view of life and the Earth, that came along with Cartesian thinking. Capra also draws the difference between the Cartesian, mechanistic worldview and medieval science, which looked more into meaning and significance of things, where the world was looked at as a living entity (Capra, 1982, p.38).

Historically, religions have taught us to perceive and act on non-human nature in terms of particular human interests, beliefs, and social structures. Through religious beliefs and laws we have socialized nature, framing it in human terms. To a great extent we have done so to satisfy human needs, abilities, and power relations. Spiritual teachings have celebrated and consecrated our ties with the non-human world, reminding us of our delicate and inescapable partnership with air, land, water, and other living beings (Mebratu, 1998, p. 497), which today are so much under-discussed in the the field of education, at schools for example. Therefore, it

is no surprise that Orr states that the present sustainability crisis is first and foremost the crisis of spirit and spiritual resources. As he says, the (problem lies with) the rootlessness and alienation of the modern world as part of a larger system of values, technologies, culture and institutions which also produce acid rain, climate change, toxic wastes, terrorism and nuclear bombs (1992, p. 4).

Yet, living in balance with nature has always been there, throughout our history. Besides the dominant religions of East and West, most of indigenous beliefs and traditions have the core element which is the importance of living in harmony with nature (Mebratu, 1998, pp. 497-498). When we look further back in time, traditional cultures have usually looked at Earth as a living being, Mother Earth, who must be respected, appreciated and cared for. Most indigenious cultures have known Earth to be alive - a vast sentient presence honored as a nurturing and sometimes harsh mother or grandmother (Harding, 2013). Before 1500 the prevailing worldview in Europe was organic, where people lived in closer contact with and dependence of nature, in smaller communities and were very much influenced by spirituality. This organic, ecological worldview was scientifically underpinned by the works of Aristotle and the Church (Studley, 1998). Later, the theory of relativity and quantum theory led the way to the understanding that the Cartesian worldview could no longer be suitable to analyse this new reality (Studley, 1998).

A growing number of scholars agree that-while there might be many situational and social barriers-the environmental, ecological worldview lies at the heart of what causes environmental behaviour (Boeve-de Pauw et al., 2011, p. 115). Sustainability issues are not fundamentally or exclusively about environment or ecology as we have sometimes come to understand. Rather, they are issues about cultural identities, social and environmental equity, respect, society-nature relationships and tensions between intrinsic and instrumental values (Wals & Jickling, 2002, p. 223) which clearly are educational issues. Therefore it might be necessary to clarify the term "ecology" and the meaning what is given to it in the present dissertation, in the context of ESD. I am relying on Jakob Saks (2005) here who states that the word "ecology" could be expanded with three additional meanings, which are discussed in research paper III of the present dissertation. Saks connects the meaning of the word "ecology" to the initial, Greek meaning of the word (in

Greek *oikos*-household, home + *logos*-the study of*)* stating that integral ecology becomes an integral philosophy of how to preserve and protect our home, the Earth and its inhabitants as a united system (Saks, 2005, p. 2). Such a concept supports the new, yet ancient, meta-paradigm of Gaia, Earth as living organism, a theory well known as Gaia Theory, developed by James Lovelock (1979). Stephen Sterling (2001) also uses the term "ecological" as synonymous to the term "holistic", united, integrated, whole (Part I of the present dissertation).

These two contrasting worldviews can also be seen as two different approaches in education therefore the following chapter investigates mechanistic and holistic views on education.

2.3.2   Mechanistic and Holistic views in Education

The field of education is responsible for re-enforcing dominant worldviews, behaviour and action on coming generations. Stephan Harding (2013) draws attention to the fact that we cut off our children from the animistic, organic worldview. Psychologists involved in the study of child development recognise that children pass through an animistic phase in their early years, during which they relate to objects as if they had a character and as if they were alive. But tragically, these same psychologists hold that the same animistic phase is only appropriate for early childhood, and that one must help children to realise as quickly and painlessly as possible that they live in a dead world in which the only experiencing entities are other humans (Harding, 2013, p.27). Harding also discusses the work of other psychologists, like James Hillmann, who suggest that animism is not a projection of human feelings onto inanimate matter but vice versa, the world projects upon us its „ideas and demands", i.e. matter is intrinsically sentient. Yet, this argumentation makes us also think whether we tend to forget that human beings are also animals by nature, i.e. subjects to laws of nature. Whatever is going on in natural world, has an effect on us and such on interactive connection may shape us more than we often acknowledge.

The work of Stephen Sterling contributes significantly to the whole discussion of the ecological, holistic view on education. He argues that we do not need more education but a specific kind of education, a change in our view on education (Sterling, 2001, p. 22). According to Sterling, our present educational systems are oriented towards socialization of an individual, developing one's professional skills and competences to be able to compete successfully on a labor market. Instead, Sterling says that we need a participatory, whole systems view on education. Such a view integrates three dimensions of education- *ethos, eidos and praxis.* Sterling calls this view a holistic, ecological view on education and learning where the key words include collegial learning, whole systems, integrative, transformative learning, holistic etc. (2001, p. 24).

Sterling points out that the current, mechanistic educational systems deal mainly with the cognitive domain of human development but holistic, ecological view on education sees a human being also as an emotional, spiritual, psychological, physical being. Sterling stresses that education also has an intrinsic value, the aim of education is not only instrumental, to provide means for success in the society but it contributes to a broader evolution, development of a moral human being. According to Sterling the ecological view on education requires transformative learning where we start seeing the world, as well as ourselves as connected (2001).This in turn requires the skills for whole systems thinking. Systems thinking addresses any problematic nexus such as this by increasing the level of abstraction or overview, rather than the conventional reductionist route of examining detail and dividing the issues into smaller parts (Sterling, 2004, p. 50). Sterling also draws our attention to the fact that sustainability cannot just be added to the existing curricula, but it involves a change in our educational thinking and practice at large, especially considering that the patterns of unsustainability influence our current and future prospects, the influence is so pressing that we risk being limited and adaptive in our response by just 'intergrating sustainability' into higher education. He argues that we should shift the emphasis from relationships based on fragmentation, control and manipulation towards those based on participation, appreciation and self-organisation (p.50), realizing our full human potential in a holistic manner. Sterling (2001) assures that the key challenge is to create and articulate an educational *ethos, eidos* and *praxis* based on the ecological paradigm (p.51) This issue is more thoroughly discussed in Part I of the present Dissertation.

Taking into consideration the underlying shift in paradigms we need to revisit the fundamental question of the aim of education at large since the challenge of the current systems starts from those basic questions. For example, David Orr (1994) points out that education too often emphasizes theories and technical efficiency, not values and conscience. It is not education, but education of a certain kind, that will save us, as he says (p. 8). Orr (1994) draws attention to six myths in education which we have used to accept without questioning and which have their roots in Cartesian thinking and which I am trying to illustrate from the point of view of TE for ESD.

Orr (1994) argues that we tend to believe that if we had enough knowledge and technology, we could solve any kinds of problems. Our education systems are largely underpinned by that same, mechanistic, instrumental understanding. For example when we believe that the more teaching and learning methods a teacher acquires, the better teacher s/he becomes. At the same time we seem to forget that a more efficient teacher does not necessarily mean a better teacher when we discuss values and worldviews that support sustainable development. On the contrary, becoming more efficient and productive in teaching fragmented subjects, re-enforcing mechanistic and instrumental values and worldviews the teacher him/herself becomes even a greater part of the problem. Orr (1994, p.9) assures us that our planet and its life systems are so complex that, looking back to our history, we are not able to safely and sustainably manage them. According to Orr (1994), it is much safer and makes more sense to shape ourselves to fit the finite planet than to attempt to reshape the planet to fit our infinite wants (p. 9). For teacher education is raises an important question of how to shape ourselves, what is this Self that we need to move towards to? Another myth Orr brings out is that with more knowledge we become better. Instead, we are flooded with information which we cannot analyze or make sense of, because we are flooded again with new information. Therefore, as Orr puts it, this *explosion of information* should not be mistaken as knowledge, or more importantly, as wisdom. By knowing so much, we seem to understand less. Instead, we tend to lose some fundamental knowledge, because it is being replaced by more „attractive" or market-orientated knowledge e.g. genetic engineering. Remembering an ancient wisdom, our heritage that has lasted for thousands of years and has proven sustainable through time should therefore also play a certain part in teacher education. Discussing modern

curriculum, Orr (1994) refers to another myth, namely the myth that we can successfully restore what has been dismantled. In our instrumentalist, mechanistic thinking we have separated the world into fragments, different disciplines, bits and pieces. As a result, our students may be successful in certain operations in a narrow field, but they lack the broad, integrated sense of the unity of things (p. 11) which in turn sets limits also to much discussed inter-, trans- and multidisciplinary approaches in education. John Miller (2007) points out similar problems. So far, education has managed to sever the relationship between head and heart which has resulted in a situation where we live in our heads, denying our deeper knowing and intuitions. He refers to the fragmentation in our education system, where we divide knowledge into subjects, units and lessons, but students do not see the relationship between facts within a subject or the relevance of this subject to their own lives (p. 4). We make decisions in one field, without understanding the consequences and effects of such decisions in a broader scale, which has brought along the current crisis in the world.

Another false understanding (myth) about the aim of education is, according to Orr (1994), that we must give students means to move upwards in a social ladder and become successful, economically on the first place. We also think that our culture is representing the top of human achievement, whereas in reality, we have replaced our ancestors' knowledge from thousands of years and their experience of maintaining balance in the world with an ever-increasing rally for more things. We have replaced a modest, balanced life where we can survive with integrity with a huge discrepancy between social classes, different nations, even between different continents. The one, who has more stuff at the end of his/her life, is a winner seems to be the slogan we are all following. Education, especially teacher education, has a critical role to play in changing such misconception.

To overcome those myths, Orr suggests certain principles that should be followed in revisiting the aims of education. Education as such is an environmental, ecological phenomenon. We cannot look at any field of human activity, e.g. economics, without knowing the laws of ecology. The focus of education should not be on becoming a master in a certain subject, but a master of one`s own personality, one's Self. This principle that Orr (1994) suggests comes from Greek concept of Paideia (p. 13). The focus on personal development,

cultivating oneself as a balanced, moral person becomes a pre-condition in foundation of any subject knowledge. This process does not take place without support and guidance, e.g. by a role model, a teacher, a guide. Giving a perfect tool, a perfect technology into the hands of immoral person will have deadly results, as the Greeks saw it. Orr brings out the importance of responsibility, meaningfulness and real practice as key elements in education.

Wals & Jickling (2002, pp. 224-225) view instrumental and holistic, as they say emancipatory approach to education. They warn that education, higher education included, is one means or instrument that governments can use to create a sustainable world as they and the interest groups influencing governments, define it. To educate for sustainability is not necessarily educational when sustainbility is fixed, pre- and expert determined, i.e. academics and to be reproduced by novices (i.e. students). More emancipatory approaches to education could contribute to the creation of a more democratic and environmentally just world and in that case education is viewed as a means for people to become self-actualized members of society, looking for meaning, developing their own potential and jointly creating solutions (p. 225). In this discussion it is also interesting to follow the critical argumentation presented by Wals & Jickling (2002, pp. 221-222) that education for sustainability/sustainable development (ESD) runs counter to prevailing conceptions of education. They draw attention to linguistics, e.g. the prepositional use of „for" prescribes that education must be in favour of some specific and undisputed objective, in this case sustainability. An emphasis on sustainability or sustainable development might hinder the inclusion of other emerging environmental thought such as deep ecology and ecofeminism (pp. 221-222) so ESD should not be seen as a separate subject or a rigid, fixed approach. Wals & Jickling (2002) warn that when ecological thinking will continue to evolve and we look at students as participants in that changing discourse, then we must look also to the variety of different, emerging ideas, not exclude them just to favour a formal sustainable development agenda. Our students should have the possibility to investigate, elaborate and create a diversity of ideas. In fact, Wals & Jickling (2002, p.222) remind us that learning takes place in a situation where different worldviews meet, creating opportunities to „learn on the edge".

.

To sum up, when addressing the problem of unsustainability in any field, especially in education, we should start by investigating our own, underlying worldviews and value-systems since they direct us from the very beginning - from identification of the problem, i.e. what we see as a problem, towards making decisions on the complexity, depth, means and ends of the solutions. Education should become the most powerful tool to make students to think differently about the world and one's place in it. Such new mind set might be seen as true innovation- innovation in our thinking. Meaningful learning should be informed not only by cognitive ways of knowing but also by intuitive and spiritual knowing that is informed by cultural, environmental and community values (Badjanova et al. 2014). Whole systems, holistic view in ESD includes re-visiting *ethos, eidos* and *praxis* of education that could start from profound questioning of our being in the world and deep connection with all life on Earth.

For teacher education programmes it sets the challenge of looking at human and societal development in a more integrated way, using a more holistic approach which also contributes to inter-, multi- and transdisciplinarity in education. After all, a teacher-to-be will become a role model for his/her future students. Yet, we need to seek a balance in both understanding the parts, fragments, subjects as well as connections between those elements. Addressing the notion of Ecological Self in TE could serve as the aim and a tool here as well.

2.3.3   Holistic Approach to Learning of Self

Starting the process of such re-visiting from within brings into discussion the notion of self which seems central to all those challenges discussed by authors presented above, since mind-sets, values, worldviews are all dimensions of self. The main question in the present context is - how should we approach learning in TE for ESD? How to learn to expand one's self?

William Pinar (1994, p. 203) states that a capitalist economy with its tendencies to commodify psycho-social processes, including personality constitution and identification, contributes to self-estrangement as well. He also points out that

within educational institutions the prospects of „authentic being" and „authentic self-knowledge" are few. That calls for a „return to things themselves", to the discovery of "authentic voice" which will have political as well as epistemological and pedagogical content (p. 203). TE students should have the possibility to investigate, elaborate and create a diversity of ideas, also related to the meaning and acknowledging the sustainability crisis and its implications on self-development. Finding their authentic voice in that context would mean investigating their own selves, finding the connection to the natural world and incorporating this connection into their professional lives.

Trying to revisit the aims of learning and education in the context of sustainability, it is worth reminding ourselves where the latter word comes from. *Educare* (Educere) in Greek means to lead or draw something out, to reveal something that is inside and learning should aid that process. We can look at human development and learning from a point of view of moulding the person to satisfy the needs of society, a labor market for instance, or we can look at the process from the point of view, where we have to support the individual to bring out the potential, the best, the talents that characterize this specific individual, nurturing the sense of connectedness, deep empathy and systems view on life at the same time. These different views also shape the understanding of the overall educational goals but also methods and techniques used in education. Learning should address all those dimensions. This is especially important in the teaching profession since it is directly linked with supporting the development of others. For student teachers it is crucial to understand that the development of others is linked to their own development as teachers and as human being more generally. This pattern of behaviour is also familiar in nature. Biologist and educator Janine Benyus (2005) gives an example from the life of hummingbirds where they pollinate plants they need for their own existence: "In the process of meeting their needs, organisms manage to fertilise the soil, clean the air, clean the water, and mix the right cocktail of atmospheric gases that life needs to live" .

Huckle (1993) discusses also challanges related to a holistic approach, bringing into attention the importance of interdisciplinarity between social and natural sciences. A teacher in that case should not merely be a subject teacher but a practitioner of a more holistic, ecological approach to teaching and learning. The

aim of such teaching is the development of the whole person, seconded also by Stephen Sterling's work on holistic, ecological view on the whole domain of education. The curriculum and the learner are not separate but connected. Strategies like creative problem solving, co-operative learning (including also setting goals for learning with students) are used in such a holistic, ecological approach to teaching and learning. Miller (2007, p. 13) says that the focus of holistic education and learning is on relationships: the relationship between linear thinking and intuition, the relationship between mind and body, the relationships among various domains of knowledge, the relationship between individual and community, the relationship to the Earth and our relationship to our souls, I might add, the relationship between a student and a teacher on so many levels. The essence of transformative learning in the context of ESD is further characterized also in PART II of the present dissertation.

Saks (2005, p.17) suggests that taking into consideration the cardinal differences between the existing, governing paradigms in the Western world and the new, evolving paradigmatic principles, the current crisis could be seen as a crisis of paradigms from one side, where the complex ecological crisis is one indicator of that process. From another side this crisis can be seen as a crisis of personal will and motivation, which forms an important dimension of self and affects the whole learning process of self development. Saks suggests that the problems are most related not to the fact that people, especially decision makers, do not know what is right or wrong, useful or damaging from an ecological point of view. Rather, Saks claims, the problems are due to humans not being able to reach consensus on how to live in harmony with nature, how to 'make' people do, what is right in that regard, how to motivate people to act together in harmony. The simple truth is, that a person can do anything if s/he wants to, but nobody can make him or her want something that s/he does not want to do. The important understanding is that the state of individual consciousness, worldview and object of observance define what an individual regards as a crisis (Saks, 2005, p. 6) and this consciousness triggers the motivation and direction for learning as well. Saks draws some examples of a paradigm change at different levels and fields (2005, pp. 16-17) which raise important questions that could be discussed in the process of learning to become a teacher for sustainability, learning of the self (Table 1):

The old paradigm	Principles of the new paradigm
The general questions connected to Life are :" What do we need, wish, want from Life, how does it serve us?"	The general questions connected to Life are "What does Life need, wish, want from us, how can we serve Life?"
The carrier of the general role of the evolutionary cycle of humanity is the rational sense (the mind) of the human being and formal and logical thinking	The carrier of the general role of the evolutionary cycle of humanity is intuition in co-operation with the brain, led by the heart and intuitive, probable and sense logic, synthesising and integral thinking
The human being identifies itself with its physical body, thoughts and emotions, its roles and fates in the society etc.	The human being is conscious of itself as a mental being, who is a soul, who has a physical body and other bodies in order to learn and be perfected on planet Earth in order to be re-united with Absolute
Dominating values and priorities are: - to possess, to act, to be; - satisfying the needs and wants of the body, senses, ego; - high life quality, standard of living; - exterior; success in society, power, self-actualization according to dominating values, wealth, riches	Dominating values and priorities are: - to be, to act, to serve; - realising the will of the soul/consciousness, taking into consideration bodily needs; - high quality of being in the world, inner peace; - mindfulness, spiritual success, transcending from"lower self, lower ego", self-guidance, self-awareness, self-realization, perfection, virtue
The main focus of attention is directed to combat with consequences, external notions, changing others (other people, nations etc), scientific-technological progress	The main focus of attention is directed to identify root causes of problems and solving them, positive future design, inner world of the person, changing oneself, virtuous behaviour in situations and to the progress of the mind and spirit
The general objective in society is the creation of the system- the human being and nature are measures	The general objective in the society is the human being and its harmony with nature- the system is a means for that

Table 1. Examples of change in paradigms (Saks, 2006).

If we take the principle of sustainability and diversity as a pre-condition here too, we should say that learning to expand one's self should involve a combination of different worldviews, different understandings. The endeavour therefore cannot carry the aim to reach for one, single truth. Since human understanding, viewpoints, theories, beliefs and morale can be very contradictory, the basis we might rely on, at this point, can be ecological principles, ecological thinking as it itself relies on the laws of nature that have been valid and functioning sustainably for millions of years. Deeper connection to nature, understanding this connection and meaning to our personal and collective well-being, personal and collective self and altering our destructive behaviour and action towards more sustainable ones can and should therefore be one of the main aims of learning and learning for teacher self in particular.

2.4 Teacher Education for Education for Sustainable Development (ESD)

Many authors and researchers (e.g. Bullough 1997, Schepens et al., 2009) have stressed, that teacher education should begin with addressing teacher identity issues, exploring the dimensions of teacher self so that future teachers, student teachers can question their own being, their own motivation, values and competencies related to the teaching profession. Babiuk &Falkenberg (2010) in the thorough report on TE for ESD in Manitoba, Canada, recommend that faculties of teacher education should make working with teacher candidates' selves (living sustainably) and professional identitites (teaching and learning for sustainability) one of the central questions of their programmes. The same stand is supported by other authors (Beijaard et al, 2004; Olsen , 2008; Korthagen, 2004) since teacher identity, teacher self forms a certain lense through which subjects are taught and values are communicated. Stibbe proposes (2011) that instead of taking on a fixed disciplinary or professional identity, student teachers should develop more fluid identities that allow them the flexibility to respond to the changing conditions of the 21st century (p. 88).

TE for ESD could be seen as an ecosystem within a larger ecosystem of education. Therefore is it equally important to reflect on the role of higher education and especially teacher education in terms of a whole systems re-design to challenge existing unsustainable concepts and approaches in the field of education (UNESCO, 2005). Education for Sustainable Development (ESD) itself is not a new approach. The Talloires Declaration (1990) was among the first statements that saw the need for environmental sustainability in higher education institutions (http://www.ulsf.org/programs_talloires.html). This declaration set a plan for including environmental literacy into university teaching, learning and research. Education for Sustainable Development was launched at the United Nations Conference on Environment and Development (UNCED) in 1992 (United Nations, 1992), followed by the Decade for the Education for Sustainable Development (2005-2014) and Global Action Programme on ESD. ESD has been declared by the UN as a priority in all fields of education, from primary to teacher education. Therefore the problem with and for the field of teacher education is to critically analyze and ask whether education itself is contributing to the sustainability crisis or whether education could be (part of) the solution towards more sustainable future? What can teacher education for sustainable development do to contribute to such a future? What 'kind' of teacher self is emerging in the context of TE for ESD?

Teaching and learning is not merely a matter of a teacher's competences and skills but, sometimes even more importantly, a matter of a teacher's mission, beliefs and identity. By learning what and how to teach, a student teacher should be able to develop his/her personal and professional self as well. Education for sustainability can bear fruit only if there is a genuine change in the mindsets of students (Segovia, 2010, page 746) i.e. in their selves. This issue is discussed more thoroughly in Part I, Part II and Part IV of the present dissertation.

Undoubtedly, the challenge of sustainability, transformation from old paradigm to the new one involves challenging ourselves as teachers and teacher educators in approaching the deeper questions related to concepts of development at large, societal development, teacher professional and personal development as well as finding the answer to the question what universal competencies, skills, approaches and understandings are necessary in the context of sustainability to be developed in

a person/a teacher. In the present context, the implication for teacher education, teacher personal and professional development means first and foremost regaining the consciousness of self, negotiating meaning of self-realization and addressing all aspects of personality potential. A teacher's potential is an opportunity to gain competence and such competence is the result of realizing one's potential. We may say that the self emerges, evolves in the process of opening one's potential. A person can open his/her potential him/herself or with the support of another, e.g. a teacher/teacher educator. Being aware of such a process is a critical pre-condition in teacher education. Going through such a process, a journey, during TE can also be seen as a rehearsal for a teacher to support his/her future students in the same process. Sustainability competences as described by Wals (2010) can be specifically addressed during TE. These competences are discussed in Part III of the present dissertation.

As the aim of the process of educating and learning can be seen as drawing out the full potential of a human being, so can the aim of teacher education for sustainable development be seen as drawing out the potential for the emerging ecological self of a teacher. In conclusion, in the context of teacher education for sustainable development the central focus of teacher education programmes should be the development of teacher ecological self.

2.5   Teacher Ecological Self

We can see the emergence of a new self in these paramount times of identity transformations (Korostelina, 2013). Reconstructing new, more sustainable societies means reconstructing also our identities to more holistic, ecological, spiritual selves. The present dissertation not only focuses on the importance of supporting the development of Teacher Self during TE, but it argues that for the purpose of our sustaining in the world, we should address a particular Self during teacher education programmes: a Teacher Ecological Self. Therefore I attempt to illuminate the road towards "ecologizing" the self or "greening" the self.

We could start unraveling the concept of ecological self by remembering different derivations of ecology. Besides coming from a well-known Greek word, *oikos* (household), e.g. Wimberley (2009) argues for a nested ecology approach. Personal ecology entails taking care of oneself, social ecology involves caring for one's community, environmental ecology means caring for the planet, cosmic ecology includes caring for the universe and spiritual ecology involves honoring the divine (p. 14). All these domains can be seen as a nested model. Personal ecology would discuss matters of lifestyles, personal health, nutrition, it would promote living in balance with human and natural communities. Personal ecology is grounded in sustainable and healthy social ecology. A person's social ecology involves relationships, attitudes, values etc. of a family, a community,a society s/he is situated in. As societies are nested in a surrounding environment, a social ecology is nested in the environmental ecology. A consideration of personal and social ecologies leads to consideration of natural environments and environmental ecology (Wimberley, 2009, p. 10). The next realm, that exceeds planetary ecologies, is the cosmic ecology where we see ourselves connected to the cosmic whole and spiritual ecology or reverential ecology (Kumar) connects us to the realms of faith, belief, respect, awe. Although the latter dimension can create confusion and questions in relations to religious beliefs etc., it yet remains a powerful construct, that can provide, as Wimberley (2009) states, a sense of identity, place and meaning in the lives of people and serve as a powerful motivator towards ecologically ethical thought, values and action (p. 13).

So, we can approach ecology not only as one more term connected with environment, but as a broad definition of every domain of human action and thought. As Wimberley adds, ecology is not just a way of life, it is Life itself (p.13, 2009). Re-connecting to nature, in diversity of forms, flows, patters and meaning, is central in the discussion of ecological self, even in connection with many religious thoughts. Zhang Hua & Zhenyu Gao (2014, p. 126) state that following nature is the key idea of Taoism, while the main aim of education according to Confucius (p.126) is cultivating a moral person and being benevolent towards all in the universe, not only people but all creatures. They describe that nature`s rules do not need perfection, the universe works harmoniously according to these rules; it is

only when people exert their will against these rules that harmony is harmed (p. 126). Hua & Gao explain further that as humanity is a living thing that is inherently unified with the whole of nature and contains the original will of the universe, so being natural is humanity`s most fundamental attribute. Thus, returning to nature is both the requisite for the development of the universe and for the realization of humanity. From educational perspective Tao suggests that we should respect the nature of our students and follow *wu wei* (nonaction), so teachers should support the natural development of students (Hua & Gao, 2014). Here, Bonnet's stress for the need of different, non-Western, metaphysics comes to mind, as it was already discussed above. The need to follow nature and deeper connection is discussed by many authors, e.g. Miller (2007), who argues that we need to re-connect to the Earth by listening to the voices of the Earth, seeing ourselves as the part of the web of life rather than being separate from it. The holistic curriculum lets us realize our deeper sense of self, our soul. We can look at two selves of human nature, where one self is our ego, our socialized sense of who we are involving roles like wife/husband etc. as well as our job identity, e.g. a teacher. Beyond this self, according to Miller (2007, p. 14), there is another self, what can be called our soul. The soul senses a deeper connection to others and all life and it opens to us when we are deeply involved in our work or simply being present in nature (Miller, 2007, p. 14). Ecological self of a teacher may be seen as a connection between this ego self and the deeper self, the soul.

Deriving from the holistic, ecological paradigm, a teacher's self should also be consistent with such a paradigm. The notion of ecological self can contribute to the understanding of the process of identification necessary for sustainable development. The notion was coined by Norwegian philosopher Arne Naess (discussed in Part I and Part II of the present dissertation), who in his concept of self-realization, was influenced by the philosophy of Mahatma Gandhi, emerging from Indian Vedanta philosophy (Haigh, 2006). He attempts to explain that our deep empathy for the living, our ecological self, is a consequence of identification with nature. Naess stresses that we feel empathy towards other living beings only if we identify with them first. By seeing similarities with oneself in another being causes the feeling of compassion and empathy and this is compared with maturation according to Naess (1987/1995). For a teacher to be, this does not only mean seeing similarities in nature, animals or insects, it also means seeing

similarities in another human being, one's future students, still embracing the diversity of others. Reitan (1996, p. 414) compares such an identification process to what a growing child goes through, whom we need to teach to feel sympathy and empathy towards others and whom we expect to identify him/herself with others in the future to be a compassionate member of the society. Reitan also concludes that the ecological self is one that is advocated both by Naess as well as Aristotle, since it shows that a person with realized ecological self is a person with virtue, striving for ecological and environmental justice and stewardship because of inner inclination, not just out of obligation (Reitan, 1996, p. 424). Besthorn (2002, p. 53) argues that ecological self suggests that nature constitutes both the beginning and the ongoing essence of full human development and potential. He says that the contemporary self is also identified with our personal or individual frame of reference, self being what represents unique individual qualities often associated with the one's physical attributes or abilities (p. 56). He is more or less suggesting that our self is a representation of our body or our skills (p. 56).

Joanna Macy (2007), who is influenced by a Buddhist way of seeing the world, describes the process of identification with nature as greening of the self. According to her, it involves combining of the mystical with the pragmatic, transcending separateness, alienation and fragmentation (p.150). This is exactly what one student teacher expressed in the longitudinal study (Part I) when she explained how she feels as one with the forest, with the whole, while practicing a meditative exercise, sitting by the tree. According to Macy, we are living the time where we experience a different level of expression of ecological selves, which are more thorougly presented in Part IV of the present dissertation. Philosophers, poets have been addressing it before, but the destruction of our environments, what we experience now has led people to express more courage and motivation to stand up against such a destruction. As Macy elaborates, such expanded sense of self leads to sustained and resilient action on behalf of life (p. 150) and such an effort cannot be linked to any single domain or field of human action. Macy suggests that the process of greening of our selves is happening now because of the three converging developments. First, the conventional small self, or ego-self as she calls it, is being psyhologically and spiritually challenged by confrontations with the dangers of mass annihilation. The second contributor to the process is a way of seeing that has arisen out of science, e.g. from living systems theory and

systems cybernetics, that connect the view of the self to the web of relationships that sustain it. Emerging non-dualistic spiritualities form the third force according to her (p. 151). According to Macy the greening of self involves also the reinhabiting time which means that the ecological self also widens our window on time. We do not identify our goals and rewards solely in terms of our present lifetime (p. 157).

As one develops an ever-widening identification with other beings, with the whole, there is no need to sacrifice self in preference to nature, since the interests of those with whom we identify, nature included, may be seen as one's own interests as well. Being with environment means realizing that humanity is part of a complex totality of interconnected relationships, and that these connections among both humans and non-humans are the very essence of existence (Besthorn, 2002, p. 61). When it comes to the notion of sacrifice and suffering it is worth asking what kind of information such feelings give us in the context of ecological self. The limits, which mark the broadening of the ecological self, might be felt by feelings of suffering, pain, empathy for others. Starting from our personal ecologies, more close environments were our empathy 'works', our ecological selves broaden gradually towards including 'further' and 'farther' beings into our realm of identification.

Sean Esbjörn-Hargens & Michael E. Zimmerman (2009) have a more diverse understanding of the development of ecological self where they describe different levels of eco-selves (see also Part IV). They argue that a successful approach to exterior ecology is dependent in important ways on the interior development of individuals towards worldcentric and planetcentric identities. Just because two people share the same exterior landscape does not mean they must inhabit the same interior cognitive or moral landscape. Given the importance of the constructive-developmental structuralism for ecology, these authors remark that it has been ignored by most ecologists and ecotheorists, even those who explicitly talk about the value of expanded identities. We cannot simply talk ourselves into eco-awareness (p.217) as they say. Esbjörn-Hargens & Zimmerman note that although several authors describe the expanding of selves, e.g. from ego-self to eco-self, the explicit models of how to develop such higher, ecological minds are scarce. They draw on the work of many predecessors attempting to model the

ecological identity development e.g. Kellert, Kahn, Geselle, Cook-Greuter and many others. They developed the 8 ecological selves-model which describe how an individual at specific levels of ego development identify with the aspects of natural world. Each eco-self has a unique way of relating to itself, others and the natural world and integrally aware individuals are able to relate to all eight of these perspectives (p. 226). All these eco-selves are critically viewed as both potentially contributing and violating ecological balance. (Esbjörn-Hargens & Zimmerman, 2009, p. 228).

In conclusion it can be said that central to the notion of teacher ecological self is a re-connection with and deep empathy for not only nature but also with higher, even spiritual dimensions of self, with a deep respect towards all Life and toward much that we still do not understand in the world. It reminds us of millions of threads of cause-and-effect that we are just learning to grasp in our messed up world and gives room to understanding that the meaning of life for us may yet encompass unimaginable horizons. Care, love and sustaining our own lives, dependent on the wellbeing of even our tiniest companions on this planet, are just a few components of our ecological selves.

In addition, we should not forget that individuals define themselves, construct and reconstruct their identities in relationship with others, with larger communities and society at large, motivated by the need of belonging (Brewer & Gardner, 1996). The evolving teacher ecological self is influenced by the collective and such a relationship deserves further investigation.

2.6   Learning to Broaden Teacher Ecological Self

The analysis of the re-emergence of an ancient ontology of ecological self raises important issues for the professionalism of teachers and teacher educators. It challenges us to ask, 'Why is this important?', 'What is the potential impact on the profession?', 'How to learn and teach it?'.

Working with teacher ecological self must be based on a new ontology of education with its implications to the constitution of moral subjectivity (Part II). The process of identification with nature and with other beings can be seen as a satisfying and rewarding journey towards self-realization of a student teacher. This process should start from re-negotiating the aims of education, learning, becoming a teacher as well as from a wide array of ontological, epistemological and methodological questions in the context of ESD.

As discussed above, *educare,* as drawing out our full potential, can be seen as an ultimate goal for any person (individual sustainability), contributing to the realisation of the full potential of the society (collective sustainability). Realising such a full potential does not mean development or growth *per se,* but in the context of the present discussion it referrs to a whole systems', integrated view on human development where we recognise that our self-actualization, our transcendence is directly connected to self-actualization of other beings. In becoming and being a teacher such recognition is especially critical.

According to Korthagen (2004, p. 77) there are two central questions determining the pedagogy of teacher education: (1) What are the essential qualities of a good teacher, and (2) How can we help people to become good teachers? Addressing the pedagogy of TE for ESD we may say that in setting the cultivation, development of a teacher ecological self as the broader aim of teacher education for sustainability the question remains how to nurture the evolvement, the broadening of a ecological teacher self during teacher education? What are the competences to be learned and methods to be used during such process?

We might well say that a teacher is not teaching a subject but teaching him/herself. As a teacher s/he is influencing his/her students in so many explicit and implicit ways. A teacher serves as an example with the whole array of his/her personal values, attitudes, behaviour and action. Clarken (2008) argues that teachers need strength to overcome the resistance, self doubt and deficiencies of the characters that inhabit the inner and outer stories of their lives. This goes for teacher educators as well. As they help students to find their own gifts, talents and selves, they find their own. Authors referenced above have stated that we find self actualization through helping others to actualize their full potential. This self-

actualization is not limited only to the human world, but non-human as well. Therefore the learning journey towards becoming a teacher for sustainability is a journey from inside out and outside in as well. Learning here means actively constructing one's identity through manipulation of elements in their environments in a social context, in a process that takes place after the decision has been made for a certain self-definition (Hormuth, 1990, p. 58). Such of self-definitions needs adressing in teacher education.

With regards to TE curriculum in that context, William Pinar (1994) suggests that the curriculum is not comprised of subjects, but of Subjects, of subjectivity. The running of the course is the building of the self, the lived experience of subjectivity (pp. 219-220). Therefore it is equally important what kind of a person a teacher is, how s/he reflects on such evolving identity, in addition to methods and techniques s/he is using to teach a specific subject. Li (2004, p. 41) adds that the ultimate aim of (TE) curriculum ought to be the integration and harmony between human and nature. In fact, the importance and effect of teacher personality, teacher identity, in this case ecological identity, in shaping students' lives has been discussed by many authors and also revealed during the longitudinal study among student teachers of a particular teacher education programme, conducted by the author of the present dissertation (see Part I and Part IV).

Illuminating the road to brodening the ecological self we can view the self as a part of the ecological system, a conjunction of other people, environments and objects. These serve as the sources and settings, instruments and symbols of social experience (Hormuth,1990). The very process of gaining an identity consists of relating to one's environment. The self-concept is conceived as a complex set of interconnected cognitions to which new knowledge is constantly added and the process favours maintenance of the self–concept rather than change. (Hormuth, 1990, p. 36). Self-concept-related processes, which are long-term processes, require an increased degree of self-focused attention. This is due to the general stability of the network of self-related cognitions. Therefore, to raise an individual's general level of self-focus, we need to find such instances that separate or distinguish a person from his or her familiar surroundings, physically and psychologically, one such instance in relocation. To relocate a person into a novel environment creates novelty. Novelty of persons, situations and environments

creates self-focused attention (Hormuth, 1990, p. 40) which can but not necessarily does contribute to the higher self-awareness and opportunities for an evolvement of self. In the context of TE for ESD, sustainability can be seen as a novelty of situations as well since the realization of the crisis and the challenge related to that is not always fully acknowledged by teacher students.

Hormuth asks a very important question: Under which conditions do people come to perceive their own beliefs as incorrect and are thus ready for self-concept change? (1990, p. 42) He proposes an answer, that a person is more likely to locate the source of error in him or herself under the conditions that create focus on self (1990, p. 42), which means that focusing on evolving teacher self during teacher education programmes is essential. Hormuth refers to many studies and draws attention to the fact that manipulations, as he uses the term for attempting the change in self, that focus on private aspects of self lead to adherence to personal standards (values, beliefs, ideals etc.) while those who focus on public aspects of self, lead to adherence to social standards (values, beliefs etc.) (1990, p. 43). We might say that in the present case, sustainability can be seen both as a social and personal standard that creates an interrelated vision, a loop of a process where personal, individual self contributes to the social, collective self of human kind. It is clear that persons are motivated to maintain their identity stability therefore it is critical to create opportunities for transformational learning that involve all aspects of self. Self-definitions are at the core of self-completion theory, where self definition is defined as an orientation towards a goal that implies readiness to behave in certain ways. Self-definitions require a personal commitment (Hormuth, 1990, p.58), which means that certain goals must be defined and the progress monitored by a person in a certain way. This includes setting certain practices as well, e.g. practicing a more ecological life-style (e.g. voluntary simplicity etc.) as a learning process for Self during teacher education.

In addition, Saks discusses self-awareness and self-development from an interesting point of view (2005, p.18) which might give valuable prospects for making changes in teacher education programmes. He sees the root cause of our ecological crisis in the consiousness and mind of the individual, the deficit in logics of the mind and feelings (empathy), greed, egocentrism, reluctance to do right things, with a right motivation, at the right time, in the right place and above all-

doing it with right methods, in a right way. This process is characterized by a formula, as he says:

IMPULSE – THOUGHT –EMOTION,FEELING – **CHOICE** – WORD – ACT –CONSEQUENCE - FEEDBACK – NEW IMPULSE.

In this formula, we can see that the choice forms a central part, that changes an intention into a decision and a decision into action, whereas all actions have consequences. Therefore the destiny and future of the human kind depends on individual and collective choices. Reitan (1996) supports that thought, drawing out that identification with others, with nature etc. is a willful process, an act of will (p. 414). As such it can be very much a matter of motivation and choice of a person, a future teacher to become a person with realized ecological, self. As we are facing now the global crisis of the whole human kind we might say, according to Saks, that our degradation is collective but our transcendence is individual (2005). In other words, a new culture is shaped by people, who want and can develop their new self- strength, motivation, awareness, logics of mind and emotions, intuition- to realize the potential of their soul/spirit to move towards perfection (2005, p. 18). Moving up the ladder, metaphorically speaking, can be exercised by whole communities, nations, if they decide so and one means is crucial here- education, a new education and civilization, which Saks calls an integral education. He illustrates also two different approaches to education, where the old approach derives from an ego intention and the new approach from a soul intention, presented in Part IV of the present dissertation. The aim of human development is not conflicting these different guiding intentions but bridging, merging those, where the Ego merges with the Soul. By evolving, transcending to a broader, higher level of consiousness, destructive phenomena, including ecological destruction will start to decrease.

Still, even when authentic and learned, it is a self we cannot be confident in part by where it is not, when it is not , what it is not. The self, who welcomes the dawn is a self constantly expanding to incorporate what it fears and resists as well as what it desires. (Pinar, 1994, p. 220). Pinar states that we as teachers are always conceived by others, by expectations and fantasies of our students, parents, adminstrators etc. We are formed as well by their and our own internalized life histories. These various spheres or levels of self-constitution invite

autobiographical investigation (Pinar 2012, p. 39) which might be the aim of future studies for the author of this dissertation.

The work of Arjen Wals has remarkably contributed to the present challenge, how to work with evolving ecological identities, e.g. he has drawn the attention to the need for working with sustainability competence, i.e. different *Gestalts,* our mind-sets. He argues that sustainability competence is an ability to switch between five different mind-sets: trans-cultural, trans-disciplinary, trans-spatial, trans-temporal and trans-human mind-sets. Sustainability competences are further discussed in Part II.

There is an array of learning and teaching methods to be used in education programmes that contribute to the evolvement of ecological self, e.g. the work of Joanna Macy, which can be incorporated in teacher education courses. Yet, the questions "Who?" and "Why?" precede the questions "How?" and "What method?" in the present discussion because a teacher truly contributes to the formation of the lens through which students come to see and understand the world.

3 RESEARCH

The present chapter gives a short summary of the research papers of the present dissertation.

3.1 Research Paper I: The Journey towards a Teacher's Ecological Self: A Case Study of a Student Teacher. (Raus, R., Falkenberg, T.)

The first article focuses on a part of a longitudinal study of student teachers, their understanding of pedagogy and connectedness with nature in the context of reorienting teacher education towards sustainability. Sterling's (2001) conceptual framework of ecological view on education was taken as a tool to analyse the collected data. The results indicated that deep connectedness to nature and empathy are framing the holistic view on learning, teaching and a teacher's self.

The paper presents a case study as part of a broader, longitudinal study that investigated the student teacher's emerging ecological self while enrolled in a teacher education programme. The critical case (Yin, 2009) allowed to understand what the emerging ecological self in a particular student teacher could look like. The aim contributed to the understanding of the educational endeavour of reorienting teacher education towards sustainability.

The aim of the broader, longitudinal study was to investigate what personal and professional identities/selves student teachers bring into teacher education by looking at students' views towards teaching, learning and nature.

The data for the broader study consisted of written responses to open-ended questions and semi-structured group and individual interview data.

After an initial analysis of the data, Marygold, a particular student teacher, stood out as a critical case for the study of the emerging ecological self in student teachers.

The case study contributed to the dissertation in two ways. First, the core layers of a student teacher's ecological self- mission, identity and beliefs, as identified in by Korthagen (2013), were illustrated through the personal story of a particular student teacher. Such an illustration could help sensitise teacher educators to the characteristics of the notion of an ecological self in terms of one's mission, identity and beliefs.

Second, the study supports the reorienting of teacher education towards sustainability by providing a concrete example of the theoretical framework by deep ecologists for reorienting teacher education for sustainability. Marygold's responses indicate what Naess's (1987/1995) notion of the ecological self means in the context of teaching and include Sterling's (2001) ecological view on learning and pedagogy.

3.2   Research Paper II: Teacher Ecological Self-an Ontological Journey towards Transformative Sustainability. (Raus, R., Värri, V.-M.)

The second part of the dissertation focuses on ontological considerations of reorienting teacher education towards sustainable development. The main purpose of the work was to re-think the basis of educational aims with the critical re-understanding of the conception of human subjectivity with its commitments to Nature. The work was conducted in a form of a book chapter, issued by Wageningen University Press.

The chapter discusses the dichotomy between Western, mechanistic worldview and holistic, ecological worldview (Capra 1983, 1996; Sterling, 2001; Harding, 2013). At the level of ontology the authors attempted to re-interpret the relationship between human and non-human beings referring to deep ecological thought by Naess and Merleau-Ponty. The notions of ecosophy and ecological self

are connected with an ancient understanding, a perennial philosophy of us being children of Mother Earth where the pre-condition of our own well-being and satisfaction is a more balanced and connected life with and in Nature. Arne Naess' construct of ecological self describes a self that identifies oneself with nature, with other beings through deep empathy but it also goes beyond the feeling of care or belonging. The authors add also the work of Abraham Maslow to the discussion where he pointed out that self-actualization can be gained through contributing to the self-actualization of others (Maslow 1973), including non-human beings (Naess 1987/1995).

The practical implications of the turning to the notion of ecological self are discussed further in the sub-chapter dedicated to teacher education. As Wals and Jickling (2002) argue, teaching about sustainability requires the transformation of mental models also of those who teach (p. 227). While relying on several authors, e.g. Naess &Sessions (1984), Mezirow (2000), Korthagen (2004), Selby and Kagawa (2015), Wals (2010, 2015) etc., ways of learning, in particular transformative learning, are investigated and connections between deep ecology approach and sustainability competences are drawn. The authors point out constraints and challenges in attempting to take a whole systems approach to transformative learning in the context of TE for ESD, since it involves the renaissance of many dimensions and constructs in the educational landscape while challenging also teacher educators' critical thinking about their own selves as agents of change.

Finally, an overview of a pilot study is given, that focused on the assessing the impact of a particular sustainability course for teachers, where deep ecology was integrated as one course theme. 107 teachers were involved in the study. The understanding of the concept of sustainability was discussed both in the beginning and at the end of the course to compare what impact the course had on the understanding of teachers. Open-ended questions were answered by the teachers, so that it was possible to compare, how they understood different aspects of sustainability in the beginning and at the end of the course. The result indicated that the number of teachers connecting sustainable development to the need to change our value-systems and re-connecting to Nature nearly tripled when compared to the beginning of the course, from 11.2% to 33.7%. This showed the

need to discuss sustainability values and deeper, value-oriented issues related to sustainability during in-service training of teachers.

The authors' aim was to illuminate the complex journey towards developing an ecological self and the complexity of this endeavour was also limiting the discussion, enabling to bring out only some critical aspects and dimensions that need to be considered when holistic approach towards TE for ESD is attempted.

3.3 Research Paper III: Modelling a Learning Journey towards Teacher Ecological Self. (Raus, R.)

The article argues for the concept of the ecological self and aims to question how to support the development of the self in a teacher education programme, by modelling the learning journey towards ecological self. Esbjörn-Hargens & Zimmerman's (2009) model of eco-selves and Saks' (2005) model of intention are used for that purpose. Some methodological aspects for supporting the development of an ecological self of a future teacher are also shared, for investigation and practical implementation in TE.

The article presents argumentation from authors, who discuss the sustainability crisis and connect it to the need to transform our mind-sets and action through rejuvenation of the field of education (e.g. Brown & Garver, 2009; Bowers, 1995; Drengson & Inoue, 1995; DuNann Winter, 2003; Hopkins, 2011; Kasemir et al., 2003; Meadows et al., 1972; Tudge, 2007).

Ecological ontology for teacher education is addressed where human and non-human worlds are seen as connected. The author relies on Naess (1973, 1987/1995), Lovelock (1979), Devall & Sessions (1985) and Saks (2005) in identifying the notions of ecology, ecological philosophy, deep ecology and ecological self. Reconstructing sustainable societies means reconstructing our identities to more holistic, ecological, authentic selves, new selves as the author argues. For example, Besthorn (2002, p. 59) states that we are seeing the re-emergence of a very old identity since many dimensions of this new, ecological self

have very ancient origins.

Further, philosophical considerations of teacher education are discussed, for example Gedzune (2015, p. 111), who says that educators should turn to philosophy for guidance on how to teach for and about sustainability and human inclusion in nature, and Mandolini (2007, p. 11) who highlights that good teacher education is not attainable without considering the moral and personal backgrounds of student teachers.

The main conceptualization of learning models for ecological self is based on the work of Esbjörn-Hargens & Zimmerman (2009) and Saks (2005). The model of 8 ecological selves is described which can be used in teacher education programmes to address different levels and aspects of ecological self. All these eco-selves are critically viewed as both potentially contributing and violating ecological balance. Saks' model of intention is presented to compare the ego intentions and soul intentions to different domains of human thinking and action that would contribute to the transformation for sustainability.

In addition, a list of competences, identified by Saks' (2005) and Wals (2010) is presented, connected to the development of ecological self of a teacher which can in turn be seen as frameworks and tools for adjusting TE programmes.

To sum up, the article contributes to the attempt to find practical models and tools, in addition to ontological considerations, to work with teacher education programmes addressing the crisis in the sustainability crisis of the world.

3.4 Research Paper IV: Student Teacher Ecological Self in the Context of Teacher Education for Sustainable Development- A Longitudinal Case Study. (Raus, R.)

The article focuses on the 4-year longitudinal study of student teachers' understanding of a teacher self and nature, through discussions of personal and professional settings. Perceived curriculum i.e. reflections on a formal curriculum of a particular TE programme were investigated to identify how the existing curriculum supports the development of an ecological, holistic self of a future teacher, according to student teachers' understanding. The study involved 9 student teachers and illuminates the process of the development of their ecological self during the first 4 years of studies in a particular initial teacher education programme.

The theoretical framework, presented in the article, starts from discussing a holistic view on education, relying on several authors e.g. Tillbury (1995), Sterling (2001), Tirri (2011), Badjanova (2014). A holistic approach to teacher development involves also educating the whole person, educating the self. Teacher identity is discussed through the lens of Fred Korthagen's onion model as well as Arne Naess' notion of ecological self. Abraham Maslow's levels of motivation add to the conceptual framework through focusing on higher, yet deeper, core motivations of human beings, e.g. altruistic motivation.

The aims of the research, presented in the article were to:
a) investigate the need to transform teacher education to become the driver of transformation for sustainable development and the role of a teacher self thereof;
b) identify dimensions of evolving student teachers' ecological identities in the context of TE for ESD;
c) make recommendations and provide discussion points for student teachers, practicing teachers, teacher educators and curriculum designers based on research findings.

The longitudinal, qualitative, collective case study (Baxter & Jack, 2008) was carried out during 4 years when the development of student teachers was studied.

The methodology of the research aimed at a holistic investigation of diverse influences of the environment as well as personal beliefs and understandings of particular student (Merriam, 1988).

The collection of rich research data was carried out as follows:

a) I stage- collection of general data about the reasons for entry into TE programme, background information about student teachers, attitudes towards learning, teaching and being a teacher.

1st year (2011/2012)- open ended questions when beginning studies and after the first practice.

b) II stage- collection of data about fears, hopes and reasons to become a teacher, attitudes towards teaching, nature, global and social problems.

2nd year (2012/2013)- narrative writing, in-depth interviews.

c) III stage- collection of data about attitudes to nature and insights to spirituality. 3rdyear (2013/2014)- group video-interview.

d) IV stage- collection of data about worldviews, attitudes to nature, spirituality, teaching-learning and becoming a teacher.

4th year (2014/2015)- in-depth interviews.

Qualitative, inductive content analysis was applied to analyse the data, where the data was analyzed step by step, devising the material into content analytical units (Mayring, 2000).

Due to the longitudinal approach the data analysis also followed the chronological line. Data analysis and data collection were conducted parallely. Data about each student teacher was gathered into one case (unit of analysis).

The research indicated that outer layers (2) of a Korthagen's 'onion model' can influence inner layers (3) and vice versa. The results of the research showed that as

study years passed, student teachers connected nature, environment protection and global problems to more personal and spiritual levels of connection between human beings and nature. This emerged due to the targeted interview questions and topics that were raised during the research discussions, as the student teacher repeatedly reported.

Sustainability topics emerged during research discussions with student teachers. From being an issue of personal values and beliefs these topics elevated to a matter of professional challenge for a teacher during the years but it was repeatedly mentioned that neither sustainability nor identity topics were present during formal TE studies.

The overall conclusion of the study revealed that even merely giving the possibility for students to articulate and discuss the notions related to self, nature, teacher's mission and motivation open up their potential to change. If these discussions are missing in teacher education programmes, the development of ecological self and even the understanding of sustainability and teacher's responsibility in addressing sustainability issues may be left to chance.

4 DISCUSSION

According to the array of recent international initiatives, strategical documents, policies and multitude of studies, sustainability crisis needs prompt and adequate solutions. Ensuring sustainable development not only for our human species but securing the flourishing of all ecosystems seems to have become one of the highest priorites for human societies. The present dissertation argues that the answer to the root cause of sustainability crisis is complex, yet familiar. The solution starts from ourselves. Yet, the emerging of the ecological self, in the context of teacher education for sustainable development, is not a construct to be taken lightly. It requires deep insights, targeted discussions and activities, that illuminate the fundamental levels and aims of us being human, us being teachers.

There is no particular, one ecological self as shown by several authors. Different ecological selves can be negotiated to address different dispositions and aspects of identity. The work of many distinguished authors can be used to conceptualize this journey of developing teacher ecological self, e.g. Maslow, Naess, Korthagen, Wals, Macy as referred to in the present discussion. Observed through years of my own studies, research and reflections, it might be said that The Teacher for Sustainability should start from questioning her/his own self, the one who seeks answers to the greatest questions together with his/her students, questions that are vital for the teacher's own development as well as for students', which in my understanding cannot be separated in several aspects. Ensuring the interplay of trans-temporal, trans-human, trans-cultural, trans-disciplinary, trans-spatial *Gestalts,* exercising these mind-sets in practice, both personal and professional, The Teacher for Sustainability cannot but come close to our spiritual, deep connection to the Earth, our home and all life. Violating the balance of Life becomes a violation of Self and such insights, I believe, direct us towards more ethical, empathic, empowering and what is even more important, transformational behaviour and actions.

Such transformation can sometimes seen as something that requires significant restrictions or remarkable alterations of everyday lifestyles. This understanding can create resistance to needed change. Instead, by opening up our deepest motives,

profound potential and horizons to become a holistic person, mature human being, we might easily discover that the connection with all life lies there, in the core. This makes the journey towards ecological self more as the path of returning home, where the interconnection with others and self, with natural order of Nature brings the sense of purpose, peace of mind and righteousness to our lives.

The field of education, teacher education and a teacher in particular carries the responsibility to bring such truly transformative change into practice because as a teacher we are not just teaching a concrete subject or a field, we are teaching everything through our own, individual lens, giving the subject a broader context, illuminating the topics with certain values and worldviews that we carry. Finally, we are teaching our Self.

5 REFERENCES

Badjanova, J., Iliško, D., & Drelinga, E. (2014). Holistic Approach in Reorienting Teacher Education towards the Aim of Sustainable Education: The Case Study from the Regional University in Latvia. *Procedia-Social and Behavioral Sciences*, *116*, 2931-2935.

Bartels, K.,Parker, K.A. (2012)(eds.). *Teaching Sustainability/Teaching Sustainably.*Stylus Publishing. Sterling.Virginia, USA

Baxter, P., & Jack, S. (2008). Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers . *The Qualitative Report*, *13*(4), 544-559. Retrieved on May 01, 2016 from http://nsuworks.nova.edu/tqr/vol13/iss4/2

Beijaard, D, Meijer, P. C., & Verloop, N. (2004). Reconsidering research on teachers'professional identity. *Teaching and Teacher Education, 20*,(2) 107–128.

Benyus, J. (2005). Genius of Nature. *Resurgence & Ecologist*, *230*. http://www.resurgence.org/magazine/article622-genius-of-nature.html. Retrieved on December 12, 2016.

Bonnett, M. (2002). Sustainability as a Frame of Mind and How to Develop it. *The Trumpeter, Journal of Ecosophy*. Vol. 18 (1), retrieved on July 05, 2015
http://trumpeter.athabascau.ca/index.php/trumpet/article/view/115/120

Bowers, C.A. (1995).*Educating for an Ecologically Sustainable Culture.* State University of New York Press.

Brewer, M.B., Gardner, W. (1996). Who is this "We"?Levels of Collective Identity and Self Representations. *Journal of Personality and Social Psychology.* Vol.71(1), 83-93

Brown, P.G., Garver, G. (2009). *Right Relationship: Building a Whole Earth Economy.*Berrett-Koehler Publishers.

Bullough,R.V. (1997) *Practicing theory and theorizing practice in teacher education.* Loughran,J &Russell, T. (eds.) Purpose, passion and pedagogy in teacher education (pp. 12-31). London: Falmer Press

Burmeister, M., Schmidt-Jacob, S., Eilks, I. (2013).German chemistry teachers' understanding of sustainability and education for sustainable development—An interview case study. *Chemistry Education Ressearch and Practice.*14,(2) 169-176.

Carpenter, J.M. (2010). *Negotiating meaning with Educational Practice: Alignment of Preservice Teacher' Mission, Identity, and Beliefs with the Practice of Collaborative Action Research.* Portland State University, United States.

Capra, F.(1983). *The Turning Point. Science, Society and the Rising Culture.* Flamingo.Published by Fontana Paperbacks.London, UK.

Capra, F., Luisi, P.L. (2014). *The Systems View of Life. A unifying vision.*Cambridge University Press.

Cortese, A. D. (2003). The critical role of higher education in creating a sustainable future. *Planning for higher education*, *31*(3), 15-22.

De Fina, A., Schiffrin, D., & Bamberg, M. (Eds.). (2006). *Discourse and identity*(Vol. 23). Cambridge University Press.

Drengson A., Inoue, Y. (1995). (Eds.) *The Deep Ecology Movement. An Introductory Anthology.* North Atlantic Books,Berkley, California.

DuNann Winter, D. (2003). *Ecological Psychology. Healing the Split Between   Planet   and   Self.* New Jersey: Lawrence Erlbaum Associates, USA

De Fina, A., Schiffrin, D., & Bamberg, M. (Eds.). (2006). *Discourse and identity*(Vol. 23). Cambridge University Press.

Ehrenfeld, J.R (2005). The Roots of Sustainability. *MIT Sloan Management Review,46*(2) , 22-26.

Gallagher, S. (2000). Philosophical conceptions of the self: implications for cognitive science. *Trends in cognitive sciences*, *4*(1), 14-21.

Haigh, M. (2006). Deep Ecology Education:Learning from its Vaisnava Roots.*Canadian   Journal   of   Environmental   Education.*Vol   11. https://files.eric.ed.gov/fulltext/EJ881794.pdf. Retrieved on January 13, 2018.

Harding, S. (2013). *Animate Earth: Science, Intuition and Gaia.*UIT/ Green

Books.Schumacher Circle, UK.

Hedlund-de Witt, A. (2013). *Worldviews and the transformation to sustainable societies: An exploration of the cultural and psychological dimensions of our global environmental challenges.* Vrieje University, Amsterdam, the Netherlands.

Hopkins, R. (2011). *The transition companion: Making your community more   resilient   in   uncertain times.* Chelsea Green Publishing. White River   Junction, Vermont. USA.

Hormuth, S. (1990). *The Ecology of Self: Re-location and Self-concept change.* Cambridge: Cambridge University Press.

Public Participation in Sustainability Science. A Handbook.(2003).   Eds Kasemir, B., Jäger, J., Jaeger, C.C., Gardner, M.T. Cambridge University Press. Cambridge, UK.

Jones, Paula, David Selby, and Stephen Sterling, eds. 2010. Sustainability Education: Perspectives and Practice Across Higher Education. London: Earthscan.

Korostelina, K. (2013). *History education in the formation of social identity.Toward a culture of peace.* Palgrave MacMillan. New York

Korthagen, F. A. J. (2004). In search of the essence of a good teacher: Towards a

more holistic approach in teacher education. *Teaching and Teacher Education, 20,*77–97. doi:10.1016/j.tate.2003.10.002

Kumar, S. *An Overview of Reverential Ecology* http://www.reverentialecology.org/kyoto_interview_pff.htm

Macy, J. (2007). World as Lover. World as Self. Parallax Press.Berkley, CA, USA.

Macy, J., Young Brown, M. (2013). Coming Back to Life. Practices to Reconnect Our lives, Our World. New Society Publishers.

Macy, J, Hahn, T.N., Berry, W., Ingerman, S. (2013a). *Spiritual Ecology: The Cry of the Earth.* The Golden Sufi Center. California.

Martin, S. (2005). Sustainability, systems thinking and professional practice. *Systemic Practice And Action Research, 18*(2), 163–171.

Maslow, A. H. (1971/1993).*The Farther Reaches of Human Nature.* An Esalen Book. Penguin Books.New York, USA

Maslow, A.H. (1962/2011).*Toward a Psychology of Being.*Martino Publishing.

Mayring, P. (2000). Qualitative Content Analysis. *Forum: Qualitative Social Research. Sozialforschung. Volume 1*, No.2, Art.20 retrieved n March 24,   2015 http://www.qualitative-research.net/index.php/fqs/article/view/1089/2386

Meadows, D.H., Meadows, D.L.,Randers, J., Behrens III, W.W. (1972).*Limits to Growth.* New York: New American Library.

Mebratu, D. (1998). Sustainability and Sustainable Development: Historical and conceptual review. *Environmental Impact Assessement Review* 18(6), pp. 493-520

Merriam, S.B (1988). *Case study research in education: a qualitative approach.* Jossey-Bass Publishers.

Miller, J.P. (2007). *The Holistic Curriculum.*University of Toronto Press.Toronto, Canada.

Naess, A. (1973). The shallow and the deep, long-range ecology movement: A summary. *Inquiry, 16*, 95–100.

Naess, A. (1987/1995). Self-realization: An ecological approach to being in the world. In A. Drengson & Y. Inoue (Eds.), *The deep ecology movement: An introductory anthology* (pp. 13–30). Berkeley, CA: North Atlantic Books.

Naess, A. (2010). *Ecology of Wisdom. Writings by Arne Naess.*Eds. Alan Drengson. Bill Devall.Counterpoint. Berkley, USA.

Newbold, T.,Hudson, L.N. Arnell, A.P., Contu, S., Palma A. D., Ferrier, S., Hill, S.L.L., Hoskins A.J., Lysenko, I., Phillips, H.R.P., Burton, V.J., Chng, C.W.T., Emerson, S., Gao D., Pask-Hale, G., Hutton, J., Jung, M., Sanchez-Ortiz, K., Simmons, B.J., Whitmee, S., Zhang, H., Scharlemann, J.P.W., Purvis, A. (2016) Has land use pushed terrestrial biodiversity beyond the planetary boundary? A global assessment. *Science* 15 Vol. 353, Issue 6296, pp. 288-291 DOI: 10.1126/science.aaf2201, retrieved on March 02, 2017.

Orr, D.W.(1992). *Ecological Literacy. Education and the Transition to a Postmodern World.* State University of New York Press.Albany.

Orr, D.W.(1994). *Earth in Mind. On Education, Environment and the Human Prospect.*Island Press. Washington DC,Covelo California.

Raus, R., Falkenberg, T. (2014). A Journey towards Teacher Ecological Self: A Case Study of a Student Teacher. *Journal of Teacher Education for Sustainability.*16 (2), 103-114.

Raus, R., Värri, V.-M. (2017). *Teacher Ecological Self. Ontological Journey.* Envisioning Futures for Environmental and Sustainability Education. Wageningen University Press. The Netherlands.

Schepens, A., Aelterman, A., & Vlerick, P. (2009). Student teachers' professional identity formation: between being born as a teacher and becoming one. *Educational Studies, 35*(4), 361-378.

Segovia, V. M. (2010). Transforming Mind-sets Through Education for Sustainable Development. In P.Peterson., E. Baker. & B. McGraw (Eds.), International Encyclopaedia of Education (3rd.ed). (pp. 746-752). Kidlington, U.K. Elsevier Science.

Smith, Gregory A. (1992). *Education and the environment: Learning to live with limits.* Albany, NY: SUNY Press.

Sterling, S. (2001). *Sustainable Education: Re-Visioning Learning and Change. Schumacher Briefings.* Schumacher UK, CREATE Environment Centre, Seaton Road, Bristol, BS1 6XN, England.

Strumse, E. (2007). The Ecological Self: A psychological perspective on anthropogenic environmental change. *European Journal of Science and Theology, June 2007, Vol.3, No.2,*11-18

Sterling, S. (2009). *Ecological Intelligence. Viewing the world relationally. The Handbook of Sustainability Literacy.*Ed. Stibbe, A. Green Books.

Studley, J. (1998). "Dominant Knowledge Systems and Local Knowledge." retrieved Retrieved on August 07, 2015. http://www.mtnforum.org/sites/default/files/publication/files/126.pdf

Tilbury, D. (1995). Environmental Education for Sustainability:defining the new focus of environmental education in the 1990s. *Environmental Education Research.1*(2), 195-212.

Tilbury, D., Stevenson, R.B., Fien, J., Schreuder, D., (eds.)2002. *Educationand Sustainability: Responding to the Global Challenge, Commission on Education and Communication, IUCN, Gland, Switzerland and   Cambridge,   UK.* xii + 206.

Tirri, K. (2011). Holistic school pedagogy and values. Finnish teachers`and students`perspectives.*International Journal of Educational Research.*50,(4) 159-165.

UNESCO (2005). Guidelines and Recommendations for Reorienting Teacher Education to Address Sustainability. Education for Sustainable Development in Action. *Technical Paper no.2.*

Verhagen, F. (2010). Ecological Identity. Creating Sustainable Communities. http://www.globalepe.org/article_print.php?aid=23, retrieved on July 13, 2016.

Wals, A.E.J., Corcoran, E.J., Blaze, P. (2012) eds. *Learning for Sustainability in Times of Accelerating Change.*Wageningen Academic Publishers.The Netherlands.

Wals, A. E., & Jickling, B. (2002). "Sustainability" in higher education: from doublethink and newspeak to critical thinking and meaningful learning.*International Journal of Sustainability in Higher Education*, *3*(3), 221-232.

Weber, T. (1999). Gandhi, deep ecology, peace research and Buddhist economics. *Journal of Peace Research*, *36*(3), 349-361.

Weinstein, M. P., & Turner, R. E. (Eds.). (2012). *Sustainability science: the emerging paradigm and the urban environment.* Springer Science & Business Media.New York.USA.

Wilson, R. A. (1996). The development of the ecological self. *Early Childhood Education Journal*, *24*(2), 121-123.

Wimberley, E.T. (2009). *Nested Ecology.The Place of Humans in the Ecological Hierarchy.*John Hopkins University Press,Baltimore, USA.

Worldwatch Institute (2000). The State of the World (Washington, D.C.: Worldwatch Institute).

Worldwatch Institute (2013) the State of the World http://www.worldwatch.org/bookstore/publication/state-world-2013-sustainability-still-possible

World Commission on Environment and Development (1987). *Our Common Future*. Oxford: Oxford University Press. p. 27. ISBN 019282080X. Retrieved on August 12, 2016 http://www.un-documents.net/our-common-future.pdf

Zhang Hua & Zhenyu Gao (2014). *Curriculum Studies in China. Retrospect and Prospect*. From: International Handbook of Curriculum Research, 2nd Edition. Editor William F. Pinar. Routledge. (pp.118-133)

6 ORIGINAL PUBLICATIONS