This issue of the JTEFS consists of seven papers that deal with fundamental issues within education for sustainable development: empowering learners to reframe mindsets and to make decisions about their preferred futures, which would involve clarity of underpinning values, rather than simply working along a predetermined path, enhancing the quality of teacher education and transforming our educational systems to name a few. I would like to thank all the members of the Editorial board for their hard work. My thanks are also due to the authors of the papers.

The paper by Tillmanns and her colleagues highlights one of the central challenges within education for sustainable development (ESD) – empowering learners to reframe mindsets, particularly those that result in unsustainable behaviours and/or actions. This paper introduces the concept of rhizome articulated by Deleuze and Guattari (1987) and proposes that it can act as a framework for re-conceptualising processes of ESD. Key constructs within the rhizome are discussed to highlight their relevance to ESD. The principles of the rhizome are then examined in the context of the processes necessary for effective ESD. The final section critically considers how this weaving of rhizomatic principles with the processes of ESD impacts on educating for sustainability. The rhizome has the potential to inspire educators and learners alike to become more critically aware of the interconnectivity and disruptive influences within sustainability.

The paper by Cutanda and Murga-Menoyo aims to prove that the mythical-metaphorical narratives from cultures in harmonic relationship with their natural environment can be considered as an educational resource within the context of ESD. Using the Earth Charter as a basis and after establishing as analysis categories the competencies that education should foster in the students from this perspective, a content analysis of 28 stories was performed. The results endorse the existing coherence between the materials analysed and the principles and values that the Earth Charter’s text reflects and the relevance of these materials as educational resources within the framework of ESD.

The paper by Flores and her colleagues draws upon data from a broader piece of research aimed at examining pre-service teachers’ views of their initial teacher education within the context of a master’s degree programme in teaching. The data were collected through questionnaires and written narratives at the beginning and at the end of the programme. In this paper, the data arising from 47 narratives at the end of the programme are presented. Five categories emerged from the qualitative data: curriculum content, teaching practice, the role of teacher educators, teaching and learning methods, the organisational aspects and structure of the programme. Although the participants identified positive aspects of the initial teacher education programme, they also stress that there is room for improvement, especially with regard to a greater coherence of the curriculum and a better articulation of its different components. Implications of the findings for enhancing the quality of initial teacher education and the role of teachers’ educators are discussed.

The paper by Viirpalu and her colleagues draws upon finding a balance between a centralised and decentralised curricular policy for general education and seeing teachers as autonomous agents of curriculum development. Radical reforms bring about the need to investigate whether and to what extent different parties – and first of all, teachers –
are ready to accept and internalise the new policies and roles as curriculum leaders to ensure the sustainability of curriculum development. The paper describes the development of a questionnaire for investigating Estonian teachers’ curricular work and preferences and to introduce the results of its piloting. The main topics covered by the questionnaire are teachers’ experience and autonomy in using and developing curricula, their preparation for curriculum development and preferences and expectations for the best curricular solutions.

The paper by Ficarra and Quinn analyse teachers’ self-reported knowledge and competency ratings for the evidence-based classroom management practices. Teachers also reflected on how they learned evidence-based classroom management practices. Results suggest that teachers working in schools that implement Positive Behavioural Interventions and Supports (PBIS) had significantly higher mean knowledge ratings in the area of posting, teaching, reviewing, monitoring and reinforcing expectations than those who do not teach in a PBIS school. Teachers certified in special education had significantly higher knowledge and competency ratings in relation to maximising structure, using a variety of techniques to respond to inappropriate behaviour than those not certified in special education. Implications of these findings for teachers’ preparation in classroom management are discussed.

Education is a future-facing activity. Therefore, universities need to engage students in building alternative and preferable future scenarios and reveal features of unsustainability, as well as open spaces for students to participate in discussions and negotiate new meanings. The paper by Iliško and her colleagues reveals the future visions bachelor’s and master’s degree students from one of the regional universities in eastern Latvia have of education and focuses on a sustainability analysis (sustainable and unsustainable) of societal aspects and education. The authors conclude that thinking about preferred futures make students more aware of the positive changes that could be made and their personal responsibility to contribute to these changes.

The paper by Raus and Falkenberg discusses the emerging ecological self of one student teacher during her initial teacher education programme. The concepts of the teacher’s self and the ecological self form a lens through which the story of this student teacher is examined. The paper focuses on one part of a broader, longitudinal study of student teachers and their understanding of pedagogy and connectedness with nature in the context of the need for reorienting teacher education towards sustainability. The results indicate that deep connectedness to nature and empathy are framing the holistic view on learning, teaching and a teacher’s self.

We hope that these papers, individually and together, will extend existing conversations and practices around teacher education for sustainability and introduce some new ones.

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Interplay of Rhizome and Education for Sustainable Development

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Abstract

One of the central challenges within education for sustainable development (ESD) is in empowering learners to reframe mindsets, particularly those that result in unsustainable behaviours and/or actions. This paper introduces the concept of rhizome articulated by Deleuze and Guattari (1987) and proposes that it can act as a framework for re-conceptualising processes of ESD. Key constructs within the rhizome, such as assemblages, nomadism, war machines and lines of flights, are discussed to highlight their relevance to ESD. The principles of the rhizome (connection, heterogeneity, multiplicity, signifying rupture, cartography and decalcomania) are then examined in the context of six processes necessary for effective ESD outlined by Tilbury (2011), namely, collaboration, dialogue, ‘whole system’ engagement, innovation within curricula, teaching and learning and active and participatory learning. The final section critically considers how this weaving of rhizomatic principles with the processes of ESD impacts on educating for sustainability. The rhizome has the potential to inspire educators and learners alike to become more critically aware of the interconnectivity and disruptive influences within sustainability. In this regard, the discussion ends by concluding that the reconceptualisation of ESD as rhizome or rhizomatic can foster an ontological shift towards perceiving the nature of reality as complex interconnected multiplicities.

Keywords: rhizome, processes of education for sustainable development, sustainability, self, ontology
Rhizome

One of the central challenges within ESD is in empowering learners to reorient their frames of mind, particularly those that result in unsustainable behaviours and/or actions. The concept of *rhizome*, articulated by Deleuze and Guattari (1987), is utilised in this discussion to re-conceptualise the processes of education for sustainable development (ESD). So, what is the *rhizome*?

From a botanical perspective, a rhizome is a horizontal, non-hierarchical root system (Figure 1). An examination of the botany of the rhizome reveals a root system that contains various points; that sometimes interconnect with other root formations, other times simply form an end-point for that part of the root. Therefore, the rhizome sometimes forms multiplicities (of roots), which, in turn, can themselves change, multiply or divide into other roots through complex encounters across the entire rhizome root system (Deleuze & Guattari, 1987).

From a philosophical perspective, Deleuze and Guattari (1987) perceive the *rhizome* as a ‘collective’ of ever changing, interconnecting multiplicities, with no central control system, which acts as an inspiration for re-conceptualising the nature of reality. The rhizomatic view of the world considers the whole inextricable combination of interrelated assemblages of individuals and groups and includes: humans, non-humans, material resources, non-material resources. In this regard, the rhizome offers a novel way of perceiving our world and, in doing so, enables us to consider the interconnection of knowledge construction, society, culture, attitudes and/or values.

The rhizomatic perception of reality elucidated by Deleuze and Guattari is offered as a viable alternative to more traditional, arborescent modes of conceiving and understanding our world. The arborescent or tree-like view of reality tends to rely on hierarchical understandings of our world. Such hierarchical understandings are characterised by a universal acceptance of the processes of segmenting our world into discrete entities, to which fixed meanings are attributed. The *rhizome* offers a means to move away from traditional and hierarchical frames of thinking as it promotes multi-perspectivity of ‘being and becoming’. The *rhizome* captures complexity and generates a fluidity that facilitates re-orientation of mindsets towards greater sustainability and harmony with the world we live in. For this reason, a rhizomatic view of ESD can make a positive contribution in enabling the reorientation of thinking and practices towards the sustainment of all living and non-living entities within our biosphere.

A rhizomatic view of ESD perceives sustainability education as distributed, interconnected, co-constructed and emancipatory through educational processes involving critical consideration of the complex interplay of human and non-human entities. The
Interplay of Rhizome and Education for Sustainable Development

Rhizome can thus be considered within the context of ESD as the on-going transformation of self, as a fertile milieu for continuous ‘becomings’ for the learner. The process of ESD, when evaluated in rhizomatic terms, involves mapping the multiple ways key sustainability concepts, attitudes and dispositions present and develop in the mindset of learners. Furthermore, within the context of education for sustainability, consideration of the extent of rhizomatic inter-connectedness leads to “alternative ways of knowing and being which include indigenous ones” (Le Grange, 2011, p. 744).

The ensuing discussion begins by outlining key constructs within the rhizome, namely, assemblages, nomadism, war machines and lines of flights, and discusses the relevance of these to ESD. The principles of the rhizome — connection, heterogeneity, multiplicity, signifying rupture, cartography and decalcomania — are then examined in the context of six processes necessary for effective ESD outlined by Tilbury (2011) — collaboration, dialogue, ‘whole system’ engagement, innovation within curricula, teaching and learning and active and participatory learning. The final section critically considers how this weaving of rhizomatic principles with the processes of ESD impacts on educating for sustainability.

**Constructs of the Rhizome**

The key constructs within the rhizome are: assemblages, nomadism, war machines and line of flights.

**Assemblages**

The rhizome, in its botanical form, consists of assemblages of roots and root systems, connected through unstructured root developments. In philosophical terms, the rhizomatic view of the world entails assemblages of individual/s, groups — human, non-human, material or non-material. Assemblages are perceived not from an insider-looking-outwards lens of our world, but rather from a meta-level perspective (outsider-looking-inwards) that considers the whole inextricable combination of interrelated parts (Deleuze & Guattari, 1987) or as wholes identified by relations of exteriority (DeLanda, 2006). Assemblages are multi-scaled, emerging at every level of the rhizome. They contain multiplicities and can indeed become further multiplicities when they connect with other assemblages. The components that form assemblages can be simultaneously part of other assemblages (DeLanda, 2006). For instance, sustainability as an assemblage consists of multiplicities, to name a few: nature, cultures, science, technology, economy, politics, conflict and peace, health, social justice, emotions, desires, interests and needs. However, economy and technology, for instance, can also be constituents of a ‘knowledge economy’ assemblage.

Assemblages present two dimensions corresponding to the characteristics of the multiplicities that form assemblages. Deleuze and Guattari (1987) elaborate that:

*On a first, horizontal, axis, an assemblage comprises two segments, one of content the other of expression [...] Then on a vertical axis, this assemblage has both territorial sides, or reterritorialized sides, which stabilise it, and cutting edges of deterritorialization, which carry it away* (p. 88).
DeLanda’s (2006) interpretation defines the horizontal axis as variable roles of an assemblage’s component and defines the vertical axis as variable processes of components. The extremes of the horizontal axis are either purely material or purely expressive. By nature, a component may be a mixture of material and expressive roles, exercising different sets of capacities (DeLanda, 2006).

A pertinent example to illustrate these key dimensions of an assemblage would be an educational intervention within a school setting. The material/content role in an educational context can be simply the classroom materials, the physical interior of classroom, buildings or indeed the trees on campus. A teaching context can demonstrate an expressive role of assemblage components. The way in which the curriculum is delivered and/or the tone, body language, attitude, emotions of the educators, as well as the students’ attitudes, attention and responses during the class, all form expressive roles of the assemblage.

The vertical axis or the variable processes of assemblage components (DeLanda, 2006),

either stabilise [processes of territorialization] the identity of an assemblage, by increasing its degree of internal homogeneity or the degree of sharpness of its boundaries, or destabilise it [processes of deterritorialization] (p. 12).

The processes of territorialisation stabilise and define territories (such as an educational institution’s identity), while also sharpening the spatial boundaries of it – for instance, single gender schools increase the homogeneity through exclusion of the opposing gender. At university level, on the one hand, internationalisation can be seen as a process of deterritorialisation, which results in an increased heterogeneity of educational institutions achieved through the augmented presence of various cultures and ethnic groups. On the other hand, information and communication technologies illustrate a destabilisation of the boundaries of formal educational institutions through distant learning and online courses. Le Grange (2011) elucidated that

sustainability education has become territorialised into a global discourse, but the global discourse is also deterritorialised resulting in reterritorialisation occurring in local contexts (p. 746).

In other words, ESD has become territorialised on a global scale but also stabilised through identified competencies, learning and teaching approaches as well as processes. On the one hand, ESD represents a common identity with spatial boundaries, which has, for instance, been identified by Wals (2012) in his report on monitoring and evaluation of the United Nations Decade of Education for Sustainable Development (DESD) in 2012. On the other hand, the suggested whole institution approaches deterritorialise the global discourse and the identity of ESD as they call for different learning, teaching and research and a university-community network that brings about change (Wals, 2012). As a result, reterritorialisation is taking place in local contexts of educational institutions, inspired by whole-institution approaches experimenting with alternatives that are suitable for their specific context. Educational institutions need to find a different purpose to be able to connect with communities, acting as open ESD resource hubs (Wals, 2014) and sharing experiences and knowledge globally.
Nomadism and War Machine

Deleuze and Guattari (1987) refer to nomadism as a way of becoming that is contrary to being and that resists the types of centralisation promoted through capitalist models. Nomads “exist only in becoming and in interaction” (Deleuze and Guattari, 1987, p. 430). Nomadism can be associated with free spaces for thinking. Nomads think without limits or boundaries and, in the process, generate creative and imaginative frames of thinking. Imaginative frames of thinking allow for the emergence of a war machine – which is “a war of becoming over being [...] becoming different, to think and act differently” (Deuchars, 2011, p. 2885), invented by the nomads and exterior to the State. In turn, the war machine is “an assemblage that makes thought itself nomadic” (Deleuze and Guattari, 1987 p. 4) and is the condition of creative change. The function of the war machine assemblage is to oppose dominating forms of state and capital; thus to resist control and the various kinds of power of the state (Deleuze & Guattari, 1987).

Deleuze and Guattari (1987) state, “... war machines have a power of metamorphosis, which of course allows them to be captured by States, but also to resist the capture and rise up again in other forms” (p. 437). As war machines can trigger substantial transformation and change, they carry the potential of being an icon of emancipation and creative change within ESD, specifically in terms of shifting neo-liberal type ontologies and resisting the global capitalist power of the state.

Lines of Flight

War machines can exist in diverse forms such as frames of mind and free movements. However, such movements or innovations can only be realised along ‘line of flights’ (Deleuze & Guattari, 1987). A key construct within the rhizome is the “line of flight”. Lines of flight are acts of deterritorialisation or processes of creation.

_The assemblage that draws lines of flight is [...] of the war machine type (pp. 229). D[eterritorialization] is absolute when it [...] brings about the creation of a new earth, in other words, when it connects lines of flight_ (Deleuze & Guattari, 1987, p. 510)

Lines of flight are the enactment of actions that can re-define whole societies, but can only emerge through the existence of a war machine. They can lead whole societies, groups or individuals to either achieve their maximum potential or to face the greatest dangers. In this respect, Deleuze and Guattari (1987) note the potential for global change through these lines of flight, “... the earth asserts its own powers of deterritorialisation, its lines of flight, its smooth spaces that live and blaze their way for a new earth” (p. 423). A creative line of flight can transform something into something else. This may mean progressing a social movement or the transformation of the mind-set of an individual. Lines of flight thus open up other territories of living and, in doing so, generate opportunities to foster alternative ways of thinking (Avolos & Winslade, 2010).

A line of flight is a rupture with unexpected potential or indeed dangers and leads to new assemblages. It emerges from transformative moments or experiences that lead to shifts in frames of mind. The transformative experience of 'lines of flight' offers much hope in ESD, precisely because of its potential in reorienting learners’ ways of thinking and acting.
Aligning Processes of ESD with Rhizomatic Principles

The principles of the rhizome – connection, heterogeneity, multiplicity, signifying rupture, cartography and decalcomania – are now examined in the context of six processes necessary for effective ESD outlined by Tilbury (2011) – collaboration, dialogue, ‘whole system’ engagement, innovation within curricula, teaching and learning, active and participatory learning. The purpose of drawing connections between processes of ESD and rhizomatic principles is not to be prescriptive or to follow a hierarchical, top-down, instrumental approach, but rather to stimulate critical thought on perceptions of reality, teaching methods, mindsets and/or institutional processes inter alia rhizomatic principles. Therefore, the following discourse sets out to explore the potential of rhizomatic principles for ESD contexts, with a specific focus on their capacity to enable shifts in ontologies and to serve as an inspiration for educators and learners to grasp, rethink and/or re-imagine ESD.

Collaboration and Dialogue, Connection and Heterogeneity

In this section, the ESD processes of collaboration and dialogue (Tilbury, 2011) are aligned with the rhizomatic principles of connection and heterogeneity (Deleuze & Guattari, 1987). The rhizomatic principles of connection and heterogeneity highlight the importance of maximal connections across assemblages and the creation of dialogues based on global outlooks (Nikolopoulou, 2010). Sustainability appears in diverse disciplines and entails an array of distinct concepts and advocates from different disciplines and from different contexts (Escrigas, Granados Sanchez, Hall, & Tandon, 2014). Therefore, as outlined by Tilbury (2011), processes of collaboration and dialogue need to be encouraged among educators and learners in order to foster trans-disciplinary understandings of sustainability within ESD. This involves valuing differing perspectives from various disciplines, universities, business, governments, civil society and communities across regions and on a global scale. It also calls upon intercultural (Tilbury, 2011) and intergenerational dialogues. Collaborations with areas of art, sport, literature, fashion, culinary, media etc. (as promoted by Barber and Rousseau in 2013) would enhance heterogeneity within ESD. Furthermore, indigenous peoples, contexts and ‘knowledges’ need to be considered to extend heterogeneity within processes of collaboration and dialogue in ESD. In this regard, our understanding of ‘indigenous peoples’ aligns with that of Breidlid (2013), and thus includes those with a shared experience of domination, that “originates with and is perpetuated by, their contact with Western hegemonic epistemology” (Breidlid, 2013, p. 31). Thus, overall ESD should highlight the connectivity of humans and non-humans, including organisms such as animals and plants (Farrell, 2013) and focus on interconnectedness, embeddedness and interdependencies within and across ecosystems.

We could use bees, drawing on the knowledge of foresters, biologists, economists and on Paris’ rooftop bee-keeping revolution (Clarke, 2012), to exemplify the high interconnectedness of everything on this planet, highlighting that everyone and everything interacts. Through the act of pollination, bees are not only closely connected with plants, humans are connected to bees too. We need them to cultivate our crops. We also enjoy as much as other species nuts, berries, fruits, not to mention nutritious honey from bees. Other animals are connected to bees, acting as parasites, living within their nest or
nourishing from their brood, pollen or wax (Bradbear, 2009). In the same way, there is a connection of bees and trees. High trees in forests are a common nesting place for bees. Bees improve the regeneration of trees and the conservation of the forest’s biodiversity through the process of pollination (Bradbear, 2009). If natural forests disappear, bees disappear and vice versa. If the bees are extinguished, we may experience a collapse of our food supply chain and, therefore, of our economy as we know it today. As a result, we come to understand that agriculture, through bees, is as much connected to the forests as economy.

There is no superior position within the rhizome, as within the realm of the rhizome everyone and everything can be an actor (Deleuze & Guattari, 1987). The rhizomatic principle of heterogeneity thus demands openness to knowing different disciplines and learners. Diversity should be reflected in ESD in order to make learners aware of the interconnectedness and heterogeneity of earth and to acquire the type of understanding essential to make sense of sustainability.

Active and Participatory Learning and Multiplicity

In this section, we examine how processes of active and participatory learning (Tilbury, 2011) align with the rhizomatic principle of multiplicity (Deleuze & Guattari, 1987). Assemblages within the rhizome contain connections between multiplicities, formed to enable the multiplicity to become some form of functional apparatus. For instance, the self is a multiplicity with several elements, such as organs, mind, gender etc. The heart itself is a multiplicity containing various elements, such as heart cells, aorta, left atrium etc. The heart is a multiplicity, that together with the self, forms the functional apparatus and assemblage that constitutes the human being. Sustainability is also a multiplicity by nature. The principle of multiplicity of the rhizome makes it impossible to define a centre (humans), elements or a hierarchy (of elements) “there are no points or positions in a rhizome, such as those found in a structure, tree or root” (Deleuze & Guattari, 1987, p. 8). The “increase in the dimensions of a multiplicity that necessarily changes in nature as it expands its connections” (Deleuze & Guattari, 1987, p. 8) indicates that the nature of sustainability can change entirely as all participants or aspects of sustainability are in constant flux. Thus, applying the principle of multiplicity to ESD enables us to understand progress in understanding or acting on sustainability as it underpins the progressive growth, expansion, transformation of knowledge and understanding.

The processes of active and participatory learning are necessary conditions for growth in dimensions of the multiplicities within ESD. In the context of sustainability education, this growth in multiplicity demands a perspective of the world through interchangeable lenses of ecologies. Guattari (1989) names three ecologies: the mental, the socius and the environment or, as Le Grange (2011) interpreted, the ecologies of self, society and nature. Rather than focusing on the constitution of one ecology and teaching ‘about’ or ‘for’ it, we should focus on the contradiction, discrepancies and oppositions between these ecologies (Guattari, 1989). This may activate isolated and heterogeneous perspectives, nurture individual cultures and simultaneously foster the imagination of new forms of thinking and practices. In turn, it may also encourage the imagination of a state order in which singularity, exceptions and rarity coexist (Guattari, 1989) to name but a few creative shades of multiplicity. For instance, as our mental
ecology is often dominated by arborescent ways of thinking, we tend to make sense of the social through hierarchy expressed by classes. Furthermore, we humans often assume a superior position over nature. This is exemplified through our urban living conditions, which not only excludes other life of this planet, allocating minor areas for nature, but is dominated by unsustainable architecture, whose construction requires the abuse of natural resources and, at a later stage, consumes high volumes of electricity for lightning, heating and cooling.

However, within these three ecologies lie capacities for creativity. For instance, the artist and architect César Manrique “felt true nostalgia for the real meaning of things. For the pureness of people. For the bareness of my landscape and for my friends” (César Manrique Foundation, 2014). This inspiration influenced the construction of his house in his homeland Lanzarote that connects his work of art and architecture with nature. The residence was built on top of a volcanic trail, the lower level of the house is positioned within the natural formation of five volcanic bubbles that are used for living spaces (Figure 2). The outside of the residence has influenced the traditional architecture of the island of Lanzarote. The island is still today characterised by the harmony of art, natural environment and Lanzarote’s culture, and Manrique’s work – found throughout Lanzarote – is an expression of such harmony.

Curriculum, Teaching, Learning Innovation and Signifying Rupture

We now need to examine how processes that innovate curriculum, teaching and learning (Tilbury, 2011) align with the rhizomatic principle of signifying rupture (Deleuze & Guattari, 1987). The principle of signifying rupture indicates that a rhizome can be broken or disrupted at any point but it does not get damaged and will regenerate (Deleuze & Guattari, 2009). My first visit to César Manrique’s house exemplifies such a rupture. Being physically in a house that was built in harmony with nature, disrupted and consequently expanded my imagination of housing. Planet earth also provides many illustrations of this principle of signifying rupture.

Let us imagine for a moment the earth as a rhizome. As we know, there is a tendency of humans to imagine the end of the world – particularly through cinema – as an armageddon (Dawson, 2013). Let us consider a nuclear holocaust. Would it mean the end of planet earth? It would probably mean the end of many species, including humans, but earth seen as a rhizome would begin again or continue as, for instance, we know that cockroaches are radiation resistant (Wright, 2010). The nuclear holocaust would be a signifying rapture. For instance, history taught us that the extinction of the dinosaurs or of ancient civilisations did not terminate life on this planet. Even if a nuclear holocaust
or global warming do become ‘signifying ruptures’, causing destruction of our living spaces, it may not imply the end of the planet, but rather a further challenge to our adaptability as a species living on this planet. Within sustainability education, there is a worthy focus on preventing such catastrophes, but very often the approach taken is human-centric in nature and doesn’t always critically consider the significance of these ruptures beyond that which impacts the wants or needs of humanity on planet earth.

Returning to ESD, educators and learners need to be more aware that any existing framework or definition of sustainability is incomplete, as sustainability is a fluid, complex concept, which does not lend itself to being generalised. Rhizomatic principles enable us to think of sustainability as being in constant flux and transformation. They allow us to relate as much new meaning as new knowledge, through the binary process of deterritorialisation current understanding/reterritorialisation of novel understanding. Processes which innovate curriculum as well as teaching and learning experiences (Tilbury, 2011) entail in a broader sense, changing mindsets, fostering active and interactive engagement, questioning social assumptions and dominant ways of thinking (Tilbury, 2011).

The pedagogy of ESD should enable transversal thinking (Guattari, 1989) which moves beyond learners’ current abilities for critical thinking (Huckle & Sterling, 1996) and linking knowledge to the fate of humanity (Nikolopoulou, 2010). A basic approach to the development of transversal thinking could be teaching about the universe and the histories of the world, before focusing on national histories (Nikolopoulou, 2010). ESD should also encourage the imagination of a post media age and raise awareness of capitalist societies depicted by mass media (Guattari, 1989). ESD should also consider the re-education of ‘holders of power’. They too would benefit from an understanding of the necessity of evaluating profits or ‘growth interest’ having in mind international interests of humanity as a whole, and acting according to a reformulated definition of wealth and nature (Nikolopoulou, 2010). The 2011 study at the Swiss Federal Institute of Technology in Zurich offers a useful starting point to examine the power dynamics in the world and the necessity of applying a broader and reformulated perspective on wealth. While mapping ownerships among the world’s transnational corporations, this study revealed a core of 1318 companies with interlocking ownerships, and, when the web of ownership was unravelled, they discovered a ‘super-entity’ of 147 corporations that control 40 per cent of the total wealth (Vitali, Glattfelder, & Battiston, 2011).

**Whole System Engagement, Cartography and Decalcomania**

We now examine how processes that engage the whole system (Tilbury, 2011) are aligned with rhizomatic principles of cartography and decalcomania (Deleuze & Guattari, 1987). A rhizome has no beginning, ending, centre or periphery. It has a very complex structure, thus making it unclear from which element or place the next will be reached, and how to get there (Deleuze & Guattari, 1987). A rhizome can be considered as a map and is distinct from what one might consider tracing. Tracing follows an arborescent thought where tree-type (hierarchical) logic reproduces what already exist, following a given path from beginning to end. Mapping is generative. Mapping is open to various manifestations. It is created on the basis of fostering new connections, proceeding from any point, picking up from the middle and creating one or many paths (Deleuze & Guattari, 1987), thus also coinciding with the process of decalcomania, a technique...
that creates images or paintings largely by chance. Unlike tracing, that aims to reproduce or describe structures, mapping constructs connections, removes blockages and creates structures.

The problem in ESD to date is that the focus has been on tracing as opposed to mapping ESD landscape. Since sustainability has been introduced within the mainstream discourse, the reliance on tracing of its elements and its structure intensified. The pillars of sustainability defined by the United Nations Educational, Scientific and Cultural Organisation are an attempt to describe the structure of sustainability and now act as guiding principles for ESD at a global level. The reproduction of these pillars can be noticed in various disciplines connected with sustainability, not to mention its application within ESD. Furthermore, the tendency towards prioritisation of one pillar over the other represents a major blockage and an opposing perspective to the rhizomatic approach. Rather than conforming to a suitable definition, it is time to experiment, to learn from and to share these experiences in order to gain a novel and fluid understanding of the meaning of sustainability. Sustainability does not need a definition. Crucial elements that supposedly contribute to the understanding of sustainability can never be fully identified. Similarly, sustainability cannot be assigned to specific disciplines or be a pure matter of teaching and learning. Besides re-imagination of the purpose of education and the relationship between teachers and learners (Carp, 2013), holistic approaches throughout the whole institution and educational system (Tilbury, 2011), in which, for instance, students are likewise included in management decisions as much as in curricula design (Bruskotter, Hitzhusen, Wilson, & Zwickle, 2013) exemplify processes which engage the whole system, as promoted by Tilbury (2011).

Conclusions

The biosphere that we inhabit is interconnected in many different ways; we as human beings make contact, interact and strive to understand this planet at physical and metaphysical levels. Perhaps we can better understand and learn about sustainability by re-conceptualising the earth in terms of rhizomatic constructs and principles. We can start this process by learning from the wisdom of plants, who, according to Deleuze and Guattari (1987), connect to multiple organisms and entities:

\[
\text{even when they have roots, there is always an outside where they form a rhizome with something else – with the wind, an animal, human beings (and there is also an aspect under which animals themselves form rhizomes, as do people, etc.) (p. 11).}
\]

Our downfall has been to have taken a human-centric approach to understanding our world; one in which we have taken human-centric approaches to understanding our place and role within planet earth. It has resulted in the depletion of many of our natural resources, damage to our environment and significant risk to the long-term sustainability of our biosphere.

The re-conceptualisation of ESD as rhizome or rhizomatic can foster an ontological shift towards perceiving the nature of reality as complex multiplicities, and, in so doing, the rhizome has the potential to inspire educators and learners alike to become more critically aware of the interconnectivity of, and disruptive influences within, sustainability, above and below the surface. Within ESD, we want to support the development of
change agents. This process of inspiring and enabling change agency necessitates the development of transformative learning and of an enterprising mindset for learners. Deleuze and Guattari’s work on rhizomatic principles provides a useful frame for developing such mindsets. As outlined in this paper, the weaving of rhizomatic principles within the processes of ESD can positively impact on educating for sustainability.

ESD needs also to support ‘becoming other’, resisting “the arrogance of certainty and self sufficient knowledge” (Cilliers, 2005, p. 265) and recognise the importance of learning sustainability from other species or indigenous people (Pigem, 2007; Wals, 2012). Chandra (2014) also points out that indigenous knowledge needs to be recognised to tackle ecological issues. In this regard, the alignment of processes of collaboration and dialogue, as detailed by Tilbury (2011), in conjunction with the rhizomatic principles of connection and heterogeneity (Deleuze & Guattari, 1987) within ESD, generates a viable pathway for responding to and interacting with differing perspectives from trans-disciplinary, intercultural and varied contexts.

And what of the rhizomatic constructs of war machines and lines of flight? There is a real need for change to be effected within ESD – the evidence to date is that while some progress has been made in the DESD (2005–2014), more needs to be done. The rhizomatic construct of the war-machine presents us with a tool to tackle issues of sustainability. It offers emancipation from conformist understandings and approaches within ESD, by shifting neoliberal type ontologies and resisting the global capitalist power of states. In this regard, further research needs to be undertaken to map how rhizomatic constructs, such as assemblages, multiplicities, war machines and lines of flights) evolve within real-world ESD settings. Only then can the synergies between rhizomatic principles and the six processes for effective ESD (as outlined by Tilbury, 2011) be examined and the extent to which our interventions in ESD support positive transformations and change agency for sustainability be assessed.

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Analysis of Mythical-Metaphorical Narratives as a Resource for Education in the Principles and Values of Sustainability

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Abstract
This research aims to prove that the mythical-metaphorical narratives from cultures in harmonic relationship with their natural environment can be considered as an educational resource within the context of education for sustainable development. Using the Earth Charter as a basis and after establishing as analysis categories the competencies that education should foster in the students from this perspective, a content analysis of 28 stories was performed. The results endorse the existing coherence between the materials analysed and the principles and values that the Earth Charter’s text reflects and the relevance of these materials as educational resources within the framework of education for sustainable development.

Key words: educational resource, mythical-metaphorical narratives, education for sustainable development, complex thinking

The Earth Charter, Mythical Narratives and ESD

Faced with the challenge of sustainable development, education has to deal with a complex problem that calls for a paradigmatic change of course to consolidate principles and values consistent with this approach. The values that have been neglected or even forgotten, by the most powerful countries, contribute to the widespread crisis we are suffering today.

In December 2002, the United Nations (UN) declared the Decade of Education for Sustainable Development (DESD) (2005–2014), making an international call to re-orient education and training towards this new sociocultural model. With this, the transformative function of education was recognised once again, claiming its role as a force for change that, extended to all areas of global society, could foster a culture of sustainability. Immediately, the United Nations Educational Scientific and Cultural Organisation (UNESCO, 2003), agency responsible for promoting this initiative, resolved to “recognize
the Earth Charter as an important ethical framework for sustainable development and
acknowledge its ethical principles, its objectives and its contents” while affirming the
Member States’ to utilise this text as an educational tool (p. 35).

The answer to the challenge offered by the DESD requires an intense work of renewal. Among other things, there will be a need for new methodologies and educational resources, which will have to show a sound coherence with those new educational goals. In times of change, which are always times for opportunities, finding new methodological ways, tools or resources is an obligatory task; a task to which we intend to join with the research presented in this paper.

The epistemological principles and values of sustainability are present, in many cases, in the mythical stories of cultures and traditions that were able to keep their connection with nature and the Earth. These are peoples who never forgot the importance of relationships, interconnections and interdependence between the multiple elements of reality. These are peoples who “have not done our terrible split [between reason and heart]” (Arocha, 1994, p. 1). This is one of the reasons why, as Gadotti (2000) pointed out, “ecology often revalues in its practices the traditions of the oldest cultures” (p. 167); traditions that have been not only capable of transmitting the values of sustainability, but also of conveying the holistic and systemic worldview that characterises this approach.

Taking all of this into account, this study adopts an initial premise; namely, that myths, legends, tales, fables and parables, through which these cultures shaped their worldview and the world of their children and young people, have a powerful potential to address the educational challenge posed by sustainable development. This is a premise that, on the other hand, was subscribed by UNESCO (2012). And, using content analysis as a research methodology, it seeks to confirm this thesis. We intend to justify the potential relevance of mythical narrative materials from different cultures as an educational resource. And we intend to do this highlighting that their contents and symbols represent a guide consistent with the typical principles, values and attitudes of that citizenship that is emerging today, attuned with a planetary consciousness, which, albeit slowly, is progressing day by day.

This research aims to identify mythical, metaphorical narratives from different cultures which can illustrate the epistemological principles and values of sustainable development as stated in the Earth Charter. Both the UN and UNESCO endorse this document as a recognised benchmark of an educational model for sustainable development. A large number of governments have signed their support for the Earth Charter.

**Background**

Scientific literature on experiences and practical applications of metaphorical mythical narratives as educational resources is related, in most cases, to the promotion of fantasy, imagination, emotional intelligence, multiculturalism or body language (Cid, 2009; Egan, 1986, 2012; González León, 2010; López Valero & Encabo, 2001; López Valero, Encabo, Moreno, & Jerez, 2003; Páez, 2011; Swaim, 1997; Zabel, 1991). Mainly, it offers models of curriculum organisation and implementation guidelines in classrooms, not only in the area of language and literature, but also in the teaching of mathematics (Cidoncha, 2011; Marín, 1999, 2003, 2007; Saá Rojo, 2002; Schiller & Peterson, 1997) or new technologies (Batelaan & Passantino, 2000; Jansen & Culpeper, 1996).
In the field of environmental education—an international movement that has been pioneering the teaching of the values and principles of sustainable development—we can highlight an internationally recognised programme that, in the eighties of the last century, based on Native American myths, used participatory educational strategies: storytelling, free association, drama, dance and sharing objects (Caduto, 1984; Caduto & Bruchac, 1988, 1991, 1994a, 1994b). Subsequent publications, although not abundant, collected other experiences that reinforce this line of work (Brody, Goldspinner, Green, & Leventhal, 2002; Ellis, 2012; Livo, 2000, 2003; MacDonald, 1999). However, we have no evidence of research linking mythical-metaphorical narratives with the Earth Charter or highlighting the potential of this kind of stories as a resource for education for sustainable development. A model described in the educational strategy for sustainable development of the United Nations Economic Commission for Europe, “as being underpinned by an ethic of solidarity, equality and mutual respect among people, countries, cultures and generations; it is development in harmony with nature, meeting the needs of the present generation without compromising the ability of future generations to meet their own needs” (UN, 2011, p. 1). We have only found, in approximate terms, the study of Ovsienko (2007), which suggests the use of proverbs, sayings, stories and songs—Tartars and Russians—as a way to present significant concepts of this model in a flexible and interactive way, and the work of Cary (2007), who uses quotations from the famous book “The Little Prince” by Antoine de Saint-Exupéry, to convey the principles of the Earth Charter to children. This research aims to fill this gap.

Objective

The objective of this work is to provide a basic list of mythical and metaphorical stories from native peoples that reflect the principles and values of the sustainability paradigm in their texts; stories that, according to their characteristics and educational potential, could be used as a resource for teaching and learning in the context of education for sustainable development.

Methodology

This research has been carried out in two phases. In the first phase, we compiled a list of mythical stories in line with the four axes that articulate the text of the Earth Charter: Respect and care for the community of life; Ecological integrity; Social and economic justice; Democracy, nonviolence and peace (the Earth Charter Initiative [ECI], 2000). In the second phase, we conducted the study that has met the most specific objective of this work.

Selection of Narratives

To identify the list of stories, we resorted to the existing literature on myths, legends, stories and other mythical and metaphorical materials, characterised by a harmonious view of the relationship between humans and their natural environment, and away from those strictly anthropocentric approaches to the universe that have lead us to the current environmental destruction (Brown, 1982; Gadotti, 2000; Taylor, 2000).
The methodical and systematic search in the digital databases, including very old books recently digitised and files of cultural materials from oral tradition located on websites, with more than 1,400 stories from Native American cultures – allowed us to identify a total of 28 mythical and metaphorical texts from 19 cultures and traditions of four continents (Table 1).

<table>
<thead>
<tr>
<th>Continents</th>
<th>Number of stories</th>
<th>Number of cultures and traditions</th>
<th>Cultures/Traditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>2</td>
<td>1</td>
<td>Yoruba</td>
</tr>
<tr>
<td>America</td>
<td>18</td>
<td>13</td>
<td>Onondaga, Cheroqui, Muskogee (Creek), Lakota, Okanagan, Pemón, Abenaki, MicMac, Iroquesa, Wampanoag, Nisqually, Cree, Hopi</td>
</tr>
<tr>
<td>Asia</td>
<td>5</td>
<td>3</td>
<td>Tibetan Buddhism, Buddhism Indian, Judaism</td>
</tr>
<tr>
<td>America-Asia</td>
<td>1</td>
<td>1</td>
<td>Inuit (Eskimo)</td>
</tr>
<tr>
<td>Oceania</td>
<td>2</td>
<td>1</td>
<td>Australian aboriginal</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>19</td>
<td></td>
</tr>
</tbody>
</table>

In this selection, we took into account seven criteria consistent with the principles and values of education for sustainable development (ECI, 2000; UN, 2011; UNESCO, 1997, 2005, 2010, 2012). These are the criteria: a) cultural diversity; b) planetarity; c) natural harmony (interdependence between species and austerity in the use of natural resources); d) social harmony (social justice, collaboration and cooperation, consensual resolution of conflicts, community involvement); e) traditionality (transmitted down through generations, preferably in oral form); f) inspiring and full of ideals (to reach the motivational core of the people); g) beauty, affection and sensitivity. On the other hand, we have observed the rules of exhaustiveness, representativeness, homogeneity and relevance.

The 28 selected stories constituted the non-probabilistic but intentional sample that we subjected to content analysis. In this sample, the number of stories belonging to Native American cultures and traditions is far superior to other cultures and geographic regions, and there is a total absence of stories from European cultures and traditions. Certainly, this is a limitation of this research.

Analysis Categories

Since we were dealing here with a verification analysis, the categories for the content analysis were the most significant descriptors of the competencies to achieve through education for sustainable development. They were established following a review of the educational literature published in three main lines of research. The first one centred on the model of education for sustainable development (Aznar & Ull, 2013; Aznar, Martínez-Agut, Palacios, Piñero, & Ull, 2011; Barrón, Navarrete, & Ferrer-Balas, 2010; Beringer, 2007; Geli, 2005; Murga-Menoyo, 2013; Novo, 2006; UNESCO, 1997, 2004, 2005, 2006, 2010, 2012). The second one focused on complex-systems thinking, a central pillar of sustainability (Boardman & Sauser, 2008; Delgado, 2008; Gadotti, 2000;

The total of 23 categories were constructed. Of these, twelve categories outline the epistemological principles, and eleven categories outline the values and attitudes of sustainability, which were expressed with a minimum of words or word fragments as possible (Delgado & Del Villar, 1995) and were operationally and accurately defined to be subject to expert judgment. The respective operational definitions are presented in Tables 2 and 3.

Table 2
Categories Related to Epistemological Principles

<table>
<thead>
<tr>
<th>Categories</th>
<th>Operational Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclusive systems thinking (IST)</td>
<td>It finds evidence of cognitive operations of synthesis, establishment of relationships and interconnections. Parts are considered as components of an interrelated and interdependent whole</td>
</tr>
<tr>
<td>Cognitive, affective ethical and aesthetic integration (Int)</td>
<td>Elements from at least three types of components are articulated, including the following: cognitive, affective, ethical and aesthetic</td>
</tr>
<tr>
<td>Theoretical and practical coherence (Coh)</td>
<td>There is a close relationship between theory and practice, between ideas and actions</td>
</tr>
<tr>
<td>Dialogic cognitive operations (DOp)</td>
<td>Dialogical relations are observed, including a conciliation between antagonistic or opposing elements</td>
</tr>
<tr>
<td>Contextualisation (Ctx)</td>
<td>Relationships are established between the requirements of the immediate context, actions and their consequences at the local and global level, or changes in global context evoke actions in the immediate context</td>
</tr>
<tr>
<td>Cotidianity (Cot)</td>
<td>It gives value to everyday experiences</td>
</tr>
<tr>
<td>Recursive cognitive operations (ROp)</td>
<td>Recursive cognitive operations, reflexiveness, self-criticism and ethical assessment of own behaviours are inferred.</td>
</tr>
<tr>
<td>Motivation for self-improvement (Slf)</td>
<td>There is an individual search of changes and challenges to meet personal needs</td>
</tr>
<tr>
<td>Participation, collaboration and cooperation (PCC)</td>
<td>The characters take part in decision making or collective action; they collaborate and cooperate to achieve a goal</td>
</tr>
<tr>
<td>Tolerance of uncertainty (Tol)</td>
<td>There are adaptive attitudes and responses at an affective level to different circumstances and changes; mechanisms of tolerance of uncertainty</td>
</tr>
<tr>
<td>Creative responses to uncertainty (CrR)</td>
<td>Uncertainty and change become a reason for seeking creative operational responses and alternative scenarios</td>
</tr>
<tr>
<td>Metaphorical-analogical thinking (MAT)</td>
<td>It uses metaphor or analogy to illustrate concepts, ideas or attitudes</td>
</tr>
</tbody>
</table>
Table 3
**Categories Related to Values and Attitudes**

<table>
<thead>
<tr>
<th>Categories</th>
<th>Operational Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precedence of common interest (CIn)</td>
<td>It conveys the idea that social or ecological common interest takes precedence over personal interest</td>
</tr>
<tr>
<td>Appreciation of the interdependence relationships (Itd)</td>
<td>The interdependence between humans or between humans and the environment are explicitly asserted or inferred</td>
</tr>
<tr>
<td>Expanded sense of identity (EId)</td>
<td>The sense of individual or group identity is blurred and/or expands in the direction of the global</td>
</tr>
<tr>
<td>Sense of belonging to the community of life (CmL)</td>
<td>They display feelings or sense of respect, affection, consideration or care for other humans or non-human or even for non-living elements of nature</td>
</tr>
<tr>
<td>Synchronic co-responsibility (SCr)</td>
<td>It establishes values of equity and social justice, fair valuation of things, awareness of the relationship between local and global realities, about consequences of our actions on the present community of life</td>
</tr>
<tr>
<td>Diachronic co-responsibility (DCr)</td>
<td>It establishes values of equity and social justice, fair valuation of things, awareness of the relationship between local and global realities, about consequences of our actions on the future community of life</td>
</tr>
<tr>
<td>Solidarity and austerity (SaA)</td>
<td>It calls for solidarity and support to the needy, as well as for moderation, austerity and simplicity in lifestyle</td>
</tr>
<tr>
<td>Empathy and affectivity (EaA)</td>
<td>They reflect concerns or feelings of empathy and affection for other humans or non-humans or even for non-living nature</td>
</tr>
<tr>
<td>Respect for life and non-violence (LNv)</td>
<td>They adopt an attitude of respect for life and non-violence in conflicts. The characters try to avoid damage to any other living or non-living element of nature</td>
</tr>
<tr>
<td>Critical and active social attitude (CAA)</td>
<td>They show critical and active social attitudes to social and environmental problems, behaviours of participation, cooperation and collaboration within a group</td>
</tr>
<tr>
<td>Respectful and open to dialogue attitude (RDA)</td>
<td>They show relation attitudes based on respect, dialogue and active listening as a way of dealing with conflict</td>
</tr>
</tbody>
</table>

**Analysis Method and Validation**

The unit of information on which the analysis has been realised is the paragraph, as it is common in attitudes and values studies. And the mode of computation for the units of analysis was the presence-absence of items in each category. We repeated the analysis of each text after a sufficient time interval to avoid potential error due to mental pollution and refine the assignment of categories to the analysis units.

As for the types of analysis, we used the following: **verification analysis** to confirm the presence of the pre-established categories in the mythical stories; **qualitative analysis** to prioritise the consistence of the stories contents with the categories, and not so much to their frequency.

The analysis of each text unit has been subjected to replication; that is, the analysis process has been duplicated, leaving a gap of five days between both performances in order to prevent contamination. In the second run, the entries of the first analysis were
reviewed one by one in order to refine, in a more strict and rigorous way, the assignment of each unit to its corresponding category.

On the other hand, the principles and values inspiring the text of these stories are closely interrelated. Therefore, we have not considered appropriate to apply the principle of mutual exclusion to the categories of analysis. In fact, in many cases, the units of analysis were assigned to several categories.

Results and Discussion

List of Mythical Stories Consistent with the Core Principles of the Earth Charter

In the stories selected, 28 altogether, there is a range of mythical narratives whose contents can illustrate the epistemological principles and values of sustainable development as reflected in the different sections of the text of the Earth Charter. The list of stories is provided in Table 4.

Table 4

<table>
<thead>
<tr>
<th>Principles of the Earth Charter</th>
<th>Mythical Texts(a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Preamble</td>
<td></td>
</tr>
<tr>
<td>(1) The Secret of Dreaming (Australian Aboriginal) (Poulter, 1988)</td>
<td></td>
</tr>
<tr>
<td>(2) The Earth on Turtle’s Back (Onondaga) (Caduto &amp; Bruchac, 1988, pp. 25–26)</td>
<td></td>
</tr>
<tr>
<td>(3) The Four Races (Cherokee) (McFadden, 1989, pp. 102–103)</td>
<td></td>
</tr>
<tr>
<td>(4) How Grandmother Spider Stole the Sun (Muskogee/Creek) (Caduto &amp; Bruchac, 1988, pp. 49–50)</td>
<td></td>
</tr>
<tr>
<td>(5) The Pact of Fire (Lakota Sioux) (Loki’s Gift, 2009)</td>
<td></td>
</tr>
<tr>
<td>Respect and care for the community of life</td>
<td></td>
</tr>
<tr>
<td>(7) Earth Woman (Okanagan) (Leeming, 2010, p. 214)</td>
<td></td>
</tr>
<tr>
<td>(8) Buddha and the Swan (Buddhism) (Fisher, 1996, pp. 45–47)</td>
<td></td>
</tr>
<tr>
<td>(9) How the Kangaroo Got Her Pouch (Australian aboriginal) (Flood, Strong &amp; Flood, 1999, pp. 248–251)</td>
<td></td>
</tr>
<tr>
<td>(10) The Legend of Shambhala (Tibetan Buddhism) (Dmitrieva, 1997)</td>
<td></td>
</tr>
<tr>
<td>(11) The Old Man and the Fig Tree (Judaism) (Bleefeld &amp; Shook, 2001, pp. 61–62)</td>
<td></td>
</tr>
<tr>
<td>Ecological integrity</td>
<td></td>
</tr>
<tr>
<td>(12) Awi Usdi, the Little Deer (Cherokee) (Caduto &amp; Bruchac, 1988, pp. 173–174)</td>
<td></td>
</tr>
<tr>
<td>(13) Wadaká Piapó: The Tree of Life (Pemon) (De Cora, 2005)</td>
<td></td>
</tr>
<tr>
<td>(14) Gluscabi and the Game Animals (Abenaki) (Caduto &amp; Bruchac, 1988, pp. 165–167)</td>
<td></td>
</tr>
<tr>
<td>(15) Gluscabi and the Wind Eagle (Abenaki) (Caduto &amp; Bruchac, 1988, pp. 67–71)</td>
<td></td>
</tr>
<tr>
<td>Social and economic justice</td>
<td></td>
</tr>
<tr>
<td>(16) How Fox Saved the People (Inuit/Eskimo) (First People (2012c)</td>
<td></td>
</tr>
<tr>
<td>(17) Koluscap and the Water Monster (Micmac) (Caduto &amp; Bruchac, 1988, pp. 81–84)</td>
<td></td>
</tr>
<tr>
<td>(18) The Legend of the First Woman (Cherokee) (First People, 2012d)</td>
<td></td>
</tr>
<tr>
<td>(19) Firstman and Firstwoman (Cherokee) (Indian Stories, n.d.)</td>
<td></td>
</tr>
</tbody>
</table>

Sequel to Table 4 see on p. 25.
Some of these narratives are related with the contents of the Earth Charter mostly in an implicit way, as those which we have linked with the preamble and the epilogue of the text. Other are better suited for certain specific principles, given the emphasis they devote to describing exemplary behaviours and situations of each case.

Epistemological Principles, Values and Attitudes of Sustainability in Mythical Stories

The in-depth content analysis was carried out on the 28 mythical stories selected. We found a total of 507 significant excerpts suited to detach and assign to the established categories. Among them, 288 excerpts have been assigned to categories of complex-systems thinking and 219 to categories related to values. On the other hand, it should be noted that each story could have one or more excerpts related to a specific category. That is why we finally chose to simply count the presence or absence of excerpts suited to be linked to each category.

The data highlight the tuning of the mythical, metaphorical materials analysed with the epistemological principles, values and attitudes of the Earth Charter. Given that, at least, more than 60% of the analysis categories are reflected in the excerpts of the stories analysed.

As can be seen in Table 5, there is a greater saturation of data in the categories that reflect characteristics of the systemic thinking (72.02%) than in those which relate to attitudes and values (63.9%). To understand this disharmony, it must be borne in mind that these stories were selected on the content of the principles of the Earth Charter, regardless of whether they reflected more or fewer categories of sustainability values, but only those categories related to the principle in question. As an example, the story “Awi Usdi, the Little Deer” explains one of the principles of the Earth Charter to perfection, as well as those values inherent to it. But this story leaves aside other values and attitudes of sustainability which, however, are conveyed through other stories.
Table 5

Presence/Absence of Excerpts of Different Categories in the Whole of the Mythical Stories

<table>
<thead>
<tr>
<th>Categories</th>
<th>Presence</th>
<th>Absence</th>
<th>Presence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complex-systems thinking categories</td>
<td>242</td>
<td>94</td>
<td>72.02</td>
</tr>
<tr>
<td>Values of sustainability categories</td>
<td>197</td>
<td>111</td>
<td>63.96</td>
</tr>
</tbody>
</table>

Presence – Presence of categorisable excerpts by a mythical story
Absence – Absence of categorisable excerpts by a mythical story
Presence (%) – Percentage of presence for categorisable excerpts within the total possible

The data provide a preliminary overview of the situation. We have found that a high percentage of the analysed stories contained in their texts elements – often loaded with a powerful symbolic force – able to encourage listeners and readers (students) both a complex, relational thinking and the values and attitudes necessary to strengthen communities characterised by sustainable development. And this evidence supports the relevance of these stories as potentially useful resources in the context of learning processes.

The conception of mythical-metaphorical stories as scenarios representing human and social problems allows us to recover their original pedagogical purpose, which is the mainstay of these pieces of oral tradition. In the present case, in our first approach to the content of the texts, we can see that the plot itself reflects a worldview that holds high levels of consistency with the principles and values of sustainable development. We shall use a brief synopsis of three of these stories to, by way of examples, support this assertion.

In “Gluscabi and the Game Animals”, the main character, fed up with the everyday stress and uncertainty resulting from hunting, asks Grandmother Woodchuck to make him a big bag, in which he gets to shut up all the animals. Delighted with his feat, because he thinks he will never have to struggle to find food, Gluscabi tells Grandmother Woodchuck what he has done. But she puts Gluscabi right, explaining to him that animals get sick and die in captivity; and ultimately there will be no food for anyone, neither for him nor for generations to come. Moreover, she makes him see the advantages to face the difficulties of hunting, which physically and mentally strengthen both the hunter and the animal. Gluscabi realises his mistake and releases the animals.

In the second story, “Gluscabi and the Wind Eagle”, he goes out with his canoe to hunt ducks, but the wind hampers his task. Gluscabi takes a long trip up to the mountain where there is a great eagle that produces the wind with his wings. Gluscabi tricks the eagle, binds him and slides him down into a large crevice. When he returns and goes out with his canoe once again, Gluscabi realises that the air is very hot, the water grows dirty and smells bad; there is so much foam on the water he can hardly paddle. When he asks Grandmother Woodchuck, she explains the benefits of wind to the community of life. Gluscabi rectifies and the balance is restored.

In the third story, “The Banyan Deer”, this character volunteers to be sacrificed in place of a pregnant doe. And when the king sees his greatness, he spares his life and grants him a wish. Then, the banyan deer thinks not only in his immediate, local context (his herd and the neighboring herd), but also in the more distant, global context, finally asking the king to respect the lives of all animals, starting with four-footed animals and then asking for birds and fish.
The poetic plot of these stories reflects the interrelationships and mutual interdependencies among the human and non-human living beings and the forces of nature. They also aim to teach the need to respect the biocapacity limits of the territory, not only for the sake of the present, but also future generations. And they present behaviours supported in values such as compassion, generosity or consistency. After various ups and downs, in which the protagonist’s courage is tested and he rectifies his mistakes, the stories ends by strengthening harmony in the community of life.

This systemic and compassionate view of reality is the common denominator of the plots in these stories. We also find in them paragraphs or sentences in which this approach is made explicit, as we show below.

For the purposes of an orderly presentation of our qualitative analysis, the discussion will be structured into two subsections: one dealing with epistemological principles and the other dealing with values.

For the sake of clarity, interpretations shall be accompanied by examples of paragraphs assigned exclusively to a single category. However, it should be noted that, in practice, the vast majority of the units of analysis reflect both principles and values, in which case they have been assigned to both categories.

**Epistemological principles.** The data for categories related to the principles of complex thinking present in the mythical stories analysed are shown in Table 6. It should be noted here that 10 of the 12 categories are reflected, at least, in more than 64% of the tales, reaching over 71% in nine of the categories. Only two of them, “Dialogic Cognitive Operations” and “Motivation for Self-Improvement”, had lower results, appearing the first of these categories in 12 stories and the second one in 11, out of the total of 28 stories.

<p>| Categories Related to Epistemological Principles Present in the Stories |
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(*The number corresponds to the title of each story as shown in Table 4.*

Inclusive systems thinking (IST); Cognitive, affective, ethical and aesthetic integration (Int); Theoretical and practical coherence (Coh); Dialogic cognitive operations (DOp); Contextualisation (Ctx); Cotidiansity (Cot); Recursive cognitive operations (ROp); Motivation for self-improvement (Sim); Participation, collaboration and cooperation (PCC); Tolerance of uncertainty (Tol); Creative responses to uncertainty (CrR); Metaphorical-analogical thinking (MAT)

As mentioned previously, the scheme of the texts in these stories is inspired by a relational thinking that calls into play multiple – in number and magnitude – and diverse factors. Fragments have been found that point to cognitive operations of building relationships and interconnections; that is, to a perception of the elements as components of an interrelated and interdependent whole. So it is in the following examples:

**We have now completed our power so that we the Five Nations Confederacy shall in the future have one body, one mind, and one heart. If any evil should befall us in the future, we shall stand or fall united as one man. (“The Peace-maker and the Tree of Peace”)**

**Without their friend to help them, the Wampanoag wondered how they would survive. They soon found, however, that when they worked for themselves, everything that they needed was there. One of those ways of survival which makes use of all that is around them – Earth, the plants, the animals and the water – is called by them Appanaug. (“The Circle of Life and the Clambake”)**

**We cannot stop the humans from hunting animals. That is the way it was meant to be. However, the humans are not doing things in the right way. If they do not respect us and hunt us only when there is real need, they may kill us all. (“Awi Usdi, the Little Deer”)**

Also, some stories describe occasions in which there are seemingly contradictory poles – good/evil, diversity/unity, freedom/common good, short term/long term, local/
global – providing a dynamic process of complementarities and oppositions that favors the exercise of complex thinking. We can see this, for example, in the following fragment:

> So we need the second as well, which is insight into the dependent co-arising of all things. It lets us see that the battle is not between good people and bad people, for the line between good and evil runs through every human heart. We realize that we are interconnected, as in a web, and that each act with pure motivation affects the entire web, bringing consequences we cannot measure or even see. ("The Shambhala Warrior")

Messages are not only implicit in the central plots of these stories, given that sometimes they are conveyed as small wedges sprinkled in the text. Thus, for instance, the following fragments are promoting an awareness of universal interdependence (which is a central element of the Earth Charter):

> ... we are all connected, like the strands of Grandmother Spider’s web... ("How Grandmother Spider Stole the Sun")

> [She said that] they would... become as one with the entire human race. ("The Legend of the Rainbow Warriors")

In them, we can find the same worldview that is present in the Earth Charter (ECI, 2000):

> As the world becomes increasingly interdependent and fragile...

> ... we are one human family and one Earth community with a common destiny (p. 1).

In short, our interpretation of the texts justifies, as quantitative data show, that more than 70% of the stories analysed can be placed within an epistemological framework characterised by a systemic conception of reality. They are, therefore, useful tools for promoting a complex, holistic and relational thinking. And this kind of thinking is a central element of the sustainability competencies that education for sustainable development should teach.

**Values and attitudes.** With respect to the data corresponding to the values that explicitly appear in the stories, as shown in Table 7, eight out of the 11 categories are reflected, at least, in more than 64% of the stories. Only two categories – Expanded Sense of Identity and Diachronic Co-responsibility – have not been reflected in more than half of the stories. But, as stated above, it must be taken into account here that we selected these narratives according to the individual principles of the Earth Charter, not seeking the highest saturation in the categories of its values. However, as a whole, these stories can cover the wide range of basic values of sustainable development. And, in most cases, many of them are complementing each other.
Table. 7

Categories Related to Values and Attitudes of Sustainability Present in the Stories

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The number corresponds to the title of each story as shown in Table 4.

Precedence of common interest (CIn); Appreciation of the interdependence relationships (Itd); Expanded sense of identity (EId); Sense of belonging to the community of life (CmL); Synchronic co-responsibility (SCr); Diachronic co-responsibility (DCr; Solidarity and austerity (SaA); Empathy and affectivity (EaA); Respect for life and non-violence (LNv); Critical and active social attitude (CAA); Respectful and open to dialogue attitude (RDA)

The interpretation of the fragments according to their axiological loading leads us to conclude that there are many occasions in which the characters keep a sound consistency between their values and behaviours; show solidarity with future generations; put the common good in front of one’s personal immediate interests. In these cases, the
narrative often has the added factor of a powerful emotional charge due to the situation itself in which actors are immersed. That happens, for instance, when – keeping the theoretical and practical coherence – the deer majestically stood up straight and walked towards danger; since, having exempted the pregnant doe to do so, he had to replace her and could not send anyone in his place (“The Banyan Deer”). Or when the old man, whom the king recalls that, given his age, he cannot enjoy the fruits of his labour, smiles and says that his work is not in vain because his children and grandchildren will enjoy its fruits (“The Old Man and the Fig Tree”). Or when the buzzard, committed to the common good, even at the expense of his own health, “... flew until he reached the top of the sky, and there he placed the Sun where it would give light to everyone” (“How Grandmother Spider Stole the Sun”); a story in which prevails the idea that common interest – whether it is a social or ecological interest – has priority over personal concerns.

Likewise, we have very often appreciated the display of feelings of respect, affection, consideration and care, even compassion for other non-human beings or non-living elements of nature. Ultimately, the characters adopt an attitude of respect for life and for the exercise of non-violence before the conflicts, trying to prevent damage to any other living being or inert element of nature. Some examples are:

An Aboriginal hunter, silently stalking the wombat! Already his boomerang was raised above his head, its smooth edges ready to slice the air. The kangaroo froze. She couldn’t even breathe. She wanted to run, but the wombat was like her joey – she had to protect him! (“How the Kangaroo Got Her Pouch”)

As soon as he saw the swan fall, Siddartha ran over to it and carefully pulled out the arrow, he took some leaves and began to wipe the blood away. He nursed the bird in his arms, stroking its white feathers. (“Buddha and the Swan”)

... everyone has the responsibility to protect the peace (...) He instructed the men to cast down their weapons of war into the cavity to bury their greed, hatred and jealousy. (...) With his powers of persuasion he won them over. (“The Peacemaker and the Tree of Peace”)

I have come so that two others need not die. Now shoot! You have your work and I have mine. (“The Banyan Deer”)

And Man knew (...) that all creatures were his spirit cousins (...) when the spirits of all creatures become tired they join the Spirit of Life in the Land. So this is why the Land is sacred and man must be its Caretaker. (“The Secret of Dreaming”)

These extracted fragments are just illustrations of the many behaviours that, in more than 60% of the stories analysed, reflect values and attitudes. We consider that all of these, given their consistency with the values required by the Earth Charter, should be a formative objective in schools. Only in this way we can respond to the appeal made by the Earth Charter to exercise it (ECI, 2000).

... we, the peoples of Earth, declare our responsibility to one another, to the greater community of life, and to future generations. (Preamble)
... to live with a sense of universal responsibility, identifying ourselves with the whole Earth community as well as our local communities. (Preamble)

Everyone shares responsibility for the present and future well-being of the human family and the larger living world. (Preamble)

Affirm that with increased freedom, knowledge, and power comes increased responsibility to promote the common good. (Principle I.2.b)

... with the right to own, manage, and use natural resources comes the duty to prevent environmental harm and to protect the rights of people. (Principle I.2.a)

Consequently, it can be said that mythical stories are valuable resources for the development of values and attitudes within the framework of education for sustainable development.

Our results contribute to strengthen the research line on experiences and practical applications of mythical-metaphorical narratives as an educational resource, providing a novel vision into a largely unexplored research direction. Thus, our research could be considered as an innovative contribution to the field of environmental education for sustainable development, specifically its epistemological principles and core values. It is, moreover, well-known that narrative materials are one of the most enriching resources to access knowledge, besides being one of the most appropriate sources to grasp the human experience (Mateos Blanco & Nuñez Cubero, 2011). It has to be certainly considered as a valuable educational resource, very pertinent and complementary in the context of the already numerous international experiences which have the Earth Charter as a central reference of its training model (Arenas Ortiz, Hinojosa Pareja, & López López, 2013).

Conclusions

The results of this research show a sound coherence between the texts of the mythical stories analysed and the epistemological principles, values and attitudes that we find in the Earth Charter. And, given that, this is a referential text in education for sustainable development, we can assert that these narratives should be considered as a potential resource for quality in educational processes in the framework of this model. We might treat this resource either as a starting point for motivation in educational activities or, with an instrumental character in pedagogical designs, to promote sustainability in the curriculum, especially in school education levels. Through this process, principles, values and procedures of the education for sustainable development model could permeate the teaching process of the educational centre and the different subjects taught in it. Or we might well treat this resource simply for values education, through mere storytelling, in formal, non-formal and informal environments.

Additionally, this research has allowed us to begin the construction of a repository of myths, legends and other metaphorical materials relevant for conveying the principles and values of sustainability that the Earth Charter calls us to practice. This work represents an approach to social and educational functions of myth and metaphorical stories, whose potential as an educational resource is worth exploiting for improving the quality of education.
On the other hand, it has been observed that the greatest part of the identified mythical stories belongs to Native American cultures and traditions, with a total absence of European mythical and metaphorical materials. This limitation needs to be corrected and offers an invitation to undertake a search and analysis of mythical, metaphorical stories related to the European cultural traditions.

Furthermore, at present, when narrative approaches seem to gain a foothold in social sciences and humanities, this would open up interesting possibilities to complement and increase the educational resources available to teachers. Within the school context, this approach would require the highest possible contextualisation of activities, trying pathways, such as the “emotional closeness with nature”, the imaginative combination of stories with sensory awareness experiences or the organisation of collaborative learning groups in virtual environments. The potentials for an educational use of mythical, metaphorical narratives are as wide as the creativity that teachers bring into play. This work provides a starting point for the context of education for sustainable development, with the support of the Earth Charter.

Finally, it is worth mentioning here that there is interest in expanding this research to include new myths that have been conceived in recent decades. Literary and film narratives which contain all the symbolic and archetypal ingredients of myths from the past seem to have emerged from the collective unconscious as a response to the critical needs of humanity today. Works like “The Lord of the Rings”, “Star Wars”, “Matrix” or “Avatar”, among many others, could play a crucial role in the face of the challenges we are confronting in a historical situation never before experienced, such as globalisation and the serious social and environmental crises in which the world currently finds itself.

Campbell & Moyers (1991), similar to Jung, said that myths “are the world’s dreams. They are archetypal dreams and deal with great human problems” (p. 21). Perhaps these new myths are carrying, in their symbolic framework, responses that are emerging from the human collective unconscious to solve its current problems: the union of very different peoples and cultures to face the great crisis (“The Lord of the Rings”); the awakening of a new and different view of reality that allows us to “see” clearly our problems (“Matrix”); the close interrelation and interconnection among all living beings on the planet under the archetypal symbol of the axis mundi, the Tree of Life (“Avatar”).

Acknowledgement

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Pre-service Teachers’ Views of Their Training: Key Issues to Sustain Quality Teacher Education

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Abstract

This paper draws upon data from a broader piece of research aimed at examining pre-service teachers’ views of their initial teacher education within the context of a master’s degree programme in teaching. The data were collected through questionnaires and written narratives at the beginning and at the end of the programme. In this paper, the data arising from 47 narratives at the end of the programme are presented. Five categories emerged from the qualitative data: curriculum content, teaching practice, the role of teacher educators, teaching and learning methods, the organisational aspects and structure of the programme. Although the participants identified positive aspects of the initial teacher education programme, they also stress that there is room for improvement, especially with regard to a greater coherence of the curriculum and a better articulation of its different components. Implications of the findings for enhancing the quality of initial teacher education and the role of teachers’ educators are discussed.

Key words: initial teacher education, student teachers, teaching practice

Investigating Teacher Education: Context and Content

Initial teacher education (ITE) is seen as a ‘long continuum’ within a lifelong perspective (Flores, 2000; Marcelo, 1999) and as the first step of a career-long process only preparing for entry into the teaching profession. Research has identified the challenges and experiences of student teachers in becoming teachers moving from the role of preservice teachers to beginning teachers (Flores, 2001; Flores & Day, 2006; Lamote & Engels, 2010; Schepens, Aelterman, & Vlerick, 2009). These studies have demonstrated that the development of teachers’ professional identity is influenced by personal, social and cognitive response as it implies an “ongoing and dynamic process which entails the making sense and (re)interpretation of one’s own values and experiences” (Flores & Day, 2006, p. 220).
The need to restructuring ITE programmes in order to meet the demands of a more and more challenging profession and a changing society are also identified in the literature. However, changes in training programmes as a result of national and international policies have to be understood in the contexts in which they were produced (Flores, 2011; Townsend, 2011). Like other European countries, ITE in Portugal has been subject to a process of restructuring as a result of the Bologna process. This has implied debates about the nature of teaching as a profession and the kinds of teachers that are to be trained within the context of current school curricula and the challenges facing the Portuguese society (Flores, 2011). Underpinning given ITE programmes are conceptions of education, teaching and learning, of the role of schools and society, as well as the kinds of teachers that are to be trained (Flores, 2004; Marcelo, 1999).

Higher professional qualification, curricula based upon leaning outcomes in the light of teacher performance, research-based qualification, the importance of teaching practice (observation and collaboration in teaching situations under the supervision of a mentor/supervisor), school-university partnerships, quality assurance of teachers’ qualification and of ITE are the key assumptions of the new policy in the Portuguese context (Ministério da Educação [Ministry of Education], 2007).

In order to become a teacher in Portugal, a master’s degree in teaching is mandated. In other words, ITE occurs at the level of second cycle after the first three-year degree programme called “Licenciatura”. A master’s degree in teaching, a two-year programme (for secondary school teachers), includes: i) training in the subject matter; ii) general educational training; iii) specific didactics (for a given level of teaching and subject matter); iv) cultural, social and ethical dimension and v) professional practice. The separation between training at the first cycle (a three-year programme called “Licenciatura”) and training at the second cycle level (a master’s degree which is now needed in order to enter the teaching profession) has been seen as a drawback from previous models of teacher education. This previous integrated programme model consisted of four to five years of training during which student teachers studied the educational sciences and subject matter simultaneously from the very beginning of the programme and one year of practicum at school (Flores, 2014; Flores, Vieira, & Ferreira, 2014).

Recent changes point to an increase in the importance of subject knowledge and didactics along with longer study programmes for pre-service teachers at the master’s level (Ministério da Educação e Ciência [Ministry of Education and Science], 2014). “Curriculum Development”, “Sociology of Education and the Teaching Profession”, “Methodology of Teaching” among many others are the examples of curricular units in the master’s degree study programme. This perspective of professional training results in reduced time and space for practicum (which occurs only at the master’s level) with implications for the pedagogical activities in which student teachers are able to engage. This separation of two cycles of studies (“Licenciatura” plus a master’s degree in teaching) in ITE has had implications for the development of professional knowledge and identity of pre-service teachers. In this regard, Moreira and Vieira (2012) argue that “the impact of this structural change is not yet clear; will second-cycle student teachers take teaching more seriously because they had more time to decide to become teachers, or will they take it less seriously because their training is shorter? And will they be able to integrate subject and pedagogical knowledge now that these curricular components are clearly separated?” (p. 97). It was within this context that the present study was carried out.
taking into account the most recent changes in ITE curriculum, but also existing research literature that will be described briefly in the next section.

The Importance of ITE

ITE has been investigated from a variety of perspectives aimed at analysing pre-service teachers’ experiences and perceptions about their training and understanding the multidimensional, idiosyncratic and contextual process of becoming a teacher (Calderhead & Shorrock, 1997; Flores, 2001; Flores & Day, 2006; Hauge, 2000). For instance, Al-Hassan, Al-Barakat and Al-Hassan’s study (2012) of pre-service teachers’ perceptions of their field experience in kindergartens and schools in Jordan identified difficulties in dealing with children’s behaviour, with children’s parents and with the ways in which some cooperating teachers, headteachers and administrators treated them. Difficulties related to the placement in kindergartens and schools and to feedback and assessment by university supervisors were identified in the same study as well as differences between theory and practice. However, student teachers saw their teaching practice as an opportunity to get to know the workplace, to gain first-hand experience, to observe teachers, to receive advice and guidance from teachers, to plan and teach classes and to deal directly with children.

Hindi (2006) identified the failure of supervisory visits and feedback given to pre-service teachers. The lack of information about the teaching practice was pointed out. In this regard, Wing-Mui, May-Hung and Chiao-Liang (1996) argue for the discussion of issues such as the quality and quantity of feedback given to student teachers. Al-Barakat (2003) found that student teachers considered their field experience very reduced, as well as the unawareness of the supervisory role from the part of cooperating teachers and headteachers.

Smith and Hodson’s study (2010) on theorising practice with a group of trainees on the employment-based graduate teacher programme in the United Kingdom, at the end of their ITE, points to the relevance of both theoretical and practical components. The study concluded that theory learned at the university was useful and influenced their practice in a positive way, as a framework and support for teaching. Benefits of learning from experience were identified, and these include the opportunity to observe colleagues’ teaching, the possibility of raising questions about others’ practice, teamwork, the possibility to teach independently and to get to know the class and students’ reactions to trainees’ teaching.

In England, Sangster and Green (2012) studied alternative placement experiences for student teachers undertaking primary initial teacher training that dealt with teaching pupils outside the age stage for which student teachers studied. Findings suggest that teaching practice was seen as an opportunity that enabled them to develop both professionally and personally, making them reflective practitioners. Amongst other issues, they identified learning from other experts, working with colleagues, gaining confidence to teach, experiencing other cultural settings, working with children in informal settings, the importance of personalising learning and experiencing second language teaching as the most important advantages of the placement experience. Kershner and Hargreaves’ study (2012) of pre-service teachers’ contributions to research on primary school children’s beliefs about knowledge and knowing (for instance, epistemological beliefs) highlighted
the “research position held by student teachers in crossing boundaries between school and university contexts” (p. 275), as well as “the particular relevance of the research topic for illuminating the out-of-school knowledge integral to children’s sense of self and learning” (p. 275). In fact, student teachers tended to be encouraged to engage in school-based research (enquiring and critical role) in order to improve their learning and professional development towards their roles as “reflective, research-informed practitioners” (Kershner & Hargreaves, 2012, p. 275). This same study identified knowledge construction (through dialogue, motivation, engagement and environmental support), knowledge transfer (between lessons, schools and inside and outside school) and knowledge use (understanding self and other perspectives and preparation for school transition and later life) as three epistemological concerns evident in pre-service teachers’ research projects characterised by dialogic connections.

Tang, Wong and Cheng (2012) in their study of professional learning in ITE show that student teachers attending a bachelor’s degree study programme ‘Education’ in Hong Kong held a constructivist vision and conception of teaching and learning based on students’ construction of knowledge and capacity for lifelong learning. This was the result of their learning experiences during the ITE programme, including the core components of the formal curriculum, informal and hidden curriculum, field experience and non-local experiences. In terms of degree of influence on the conception of teaching and learning, field experience was the most influential one, followed by the formal, informal and hidden curriculum.

The current model of ITE in the Portuguese context implies less time spent in schools during the teaching practice making the development of pedagogical projects in school more difficult. The existing literature has also shown the ITE curriculum fragmentation and lack of coherence of its key components (Flores, 2011), the mismatch between theory and practice, as well as the lack of adequate preparation to face the day-to-day professional practice at school (Flores, 2000; Flores & Day, 2006). The perception that ITE is mainly theoretical and disconnected from the real world of schools has been identified in research literature (Ebby, 2000; Flores, 2001, 2006). In this regard, Formosinho (2009) stresses the emphasis on the academic-oriented logic prevailing in many initial teacher education programmes which is associated with knowledge fragmentation and with the existence of subject-related territories linked to university departments (Formosinho, 2009) which, in turn, hinders teaching co-ordination and curriculum articulation (Vieira, Flores, & Ferreira, 2012).

The Study: Goals, Participants and Methods

This paper draws on data from a larger piece of research looking at the key components of ITE in order to understand pre-service teachers’ views and experiences on the ITE programme, including teaching practice as a result of the implementation of the Bologna process. The exploratory study reported in this paper was based on the following research questions: How do pre-service teachers view their initial teacher education programme? How and what do they learn during ITE?

Data were collected through written narratives at the end of the two-year programme. The goals of the study were presented to all pre-service teachers at the end of the second year of their studies, and some volunteers were invited to participate. The aim was to
understand their perceptions about and experiences on their training during the ITE programme. The narratives (approximately two pages each) included pre-service teachers’ overall evaluation of the programme, the ways in which they view its key components and their learning experience throughout the course, including suggestions for improvement. The key emerging themes were used to develop the following phases of the wider project.

In total, 47 pre-service teachers volunteered to write narratives about their ITE experience at the end of the second year of the master’s degree programme. Of these, 10 are male students, and 37 are female students aged 22–45 years. Participants studied in different programmes (a two-year master’s level programme): “Portuguese and Spanish”, “Portuguese and Classical Languages”, “Philosophy”, “Maths”, “Biology and Geology”, “Physical Education”, “History and Geography”, “English and Spanish” (Table 1). The written narratives were collected in May 2011 and 2012.

The process of qualitative data analysis was undertaken according to a vertical analysis (Miles & Huberman, 1994): each of the narratives was analysed separately, and there was a comparative or horizontal analysis (cross-case analysis) (Miles & Huberman, 1994) to look for similarities as well as differences. In this paper, five emerging themes are presented: i) curriculum content; ii) teaching practice; iii) role of teacher educators; iv) organisational aspects and structure of the programme; v) teaching and learning methods.

**Table 1**

<table>
<thead>
<tr>
<th>Participants</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>37</td>
<td>78,7%</td>
</tr>
<tr>
<td>Male</td>
<td>10</td>
<td>21,3%</td>
</tr>
<tr>
<td><strong>Age Range</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[20–25]</td>
<td>23</td>
<td>50%</td>
</tr>
<tr>
<td>[26–30]</td>
<td>9</td>
<td>19,6%</td>
</tr>
<tr>
<td>[31–35]</td>
<td>9</td>
<td>19,6%</td>
</tr>
<tr>
<td>[36–40]</td>
<td>3</td>
<td>6,5%</td>
</tr>
<tr>
<td>[41–45]</td>
<td>2</td>
<td>4,3%</td>
</tr>
<tr>
<td><strong>ITE Programme</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portuguese and Spanish</td>
<td>14</td>
<td>29,8%</td>
</tr>
<tr>
<td>Portuguese and Classical Languages</td>
<td>9</td>
<td>19,1%</td>
</tr>
<tr>
<td>Philosophy</td>
<td>7</td>
<td>14,9%</td>
</tr>
<tr>
<td>Maths</td>
<td>7</td>
<td>14,9%</td>
</tr>
<tr>
<td>Biology and Geology</td>
<td>3</td>
<td>6,4%</td>
</tr>
<tr>
<td>Physical Education</td>
<td>3</td>
<td>6,4%</td>
</tr>
<tr>
<td>History and Geography</td>
<td>2</td>
<td>4,3%</td>
</tr>
<tr>
<td>English and Spanish</td>
<td>2</td>
<td>4,3%</td>
</tr>
</tbody>
</table>
Findings

Findings are analysed according to five main categories which emerged from pre-service teachers’ accounts at the end of their ITE programme: curriculum content, teaching practice, the role of teacher educators, organisational aspects and structure of the programme and teaching and learning methods. Pre-service teachers also identified suggestions for improvement of their initial teacher education programme which are explored later in this paper.

Table 2 presents the categories emerging from the participants’ accounts. Curriculum content and teaching practice are the most recurring categories.

Table 2
Most Recurring Categories Emerging from Pre-service Teachers’ Accounts

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curriculum content</td>
<td>41</td>
</tr>
<tr>
<td>Teaching practice</td>
<td>36</td>
</tr>
<tr>
<td>Role of teacher educators</td>
<td>23</td>
</tr>
<tr>
<td>Organisational aspects and structure of the programme</td>
<td>20</td>
</tr>
<tr>
<td>Teaching and learning methods</td>
<td>15</td>
</tr>
</tbody>
</table>

Curriculum Content

Curriculum content was one of the emerging categories mentioned by pre-service teachers when they looked back on their ITE programme. In general, they highlighted the adequacy and relevance of given subjects/modules:

Some of the curricular units are important and adequate to meet students’ needs. (ST33)

The curricular units are very interesting and relevant for the future teaching career. (ST34)

However, some of them also identified some negative features related to the content of the curriculum of their ITE programme, namely the lack of adequacy, relevance and articulation between given subject matter/modules, duplication in content, which they associate with poor organisation of the given modules and the gap between theory and practice, especially in regard to the modules delivered in the second year of the programme concomitantly with teaching practice at school:

Some modules are of little interest and make you waste your time. It would be more useful to invest in your teaching practice. (ST21)

In some modules, contents overlap. (ST23)

Subjects are distant from schools’ reality, and they remain very theoretical. (ST26)

There is a poor articulation between subject matter and modules. (ST32)

Given modules do not always meet the needs of the teaching practice. (ST33)
Teaching Practice

Teaching practice was a key issue in the participants’ accounts. By and large, they highlighted a number of positive issues related to their teaching practice, such as the practical component and the good interaction with university supervisors and cooperating teachers in schools. They stressed the opportunity to teach, classroom observation, interaction with pupils, the contact with school reality and the development of professional competencies in practice as positive aspects. This is in line with previous empirical work (Flores & Day, 2006; Tang et al., 2012).

The most important learning experiences related the teaching practice, especially in regard to the interaction with pupils, the possibility to develop a critical discussion with the university supervisors and cooperating teachers. (ST5)

During my second year, I would stress the possibility to observe cooperating teachers’ lessons and to teach a group of pupils. (ST21)

There is no doubt that the intervention in a real context with real students was of paramount importance as far as the development of personal and professional abilities and competencies is concerned. (ST30)

However, most of the pre-service teachers also identified a number of negative aspects. One of the most recurring comments centred on their belief that teaching practice was too short with implications for the development and evaluation of the pedagogical intervention project in schools as well as for the final report of pre-service teachers’ experience in a real context. During teaching practice, pre-service teachers observe in classrooms and develop a ‘pedagogical project’ in a school, under the supervision of the co-operating school teachers and university supervisors. Throughout the second year, pre-service teachers attend seminars and modules that are supposed to support the development of the ‘pedagogical project’ in light of their needs and interests (for instance, curriculum project, learning environments, pupils’ behavioural problems etc.).

I think the duration of teaching practice is too short. You should have more time to observe and to teach pupils at school as this is one of the most important components of your learning to become a teacher. Teaching practice should be longer and you should have the possibility to teach more lessons. (ST8)

Because the teaching practice is too short, you cannot develop your intervention project as you would like to. It becomes a very restricted project related to a specific area and to a given reality. (ST28)

In the second year of the ITE programme, you have to undertake a number of practical tasks, and there is no connection among them or between them and your intervention project. Some of them are useless, and, most importantly, they do not have any connection with your pedagogical intervention project in the school. And, on the top of that, little time is left for you to develop and evaluate your intervention project during your teaching practice. (ST47)

Some participants identified the following as negative aspects: the delay in receiving information about placements for their field experience; the lack of coordination amongst departments, university supervisors and coordinators within the context of their teaching practice; the mismatch between given subjects/modules and pre-service teachers’ needs
related to their teaching practice and the poor consolidation of the teaching practice model.

Subjects and modules are important in the first year of the programme, but this is not the case with the subjects and modules during the second year of your studies. Some of them are useless and not relevant to your teaching practice. And you feel that you waste your time with them. You could invest your energy and time in your teaching practice in schools and in your final report. (ST15)

One of the most negative experiences during my teaching practice is the fact that subjects and modules in the second year of the programme do not always meet your needs during your teaching practice. (ST33)

I think that there is no coordination between university and school. In other words, subjects should be articulated with teaching and with the project development during your teaching practice. And my experience is not positive in this regard. (ST46)

The Role of Teacher Educators

One recurring element in pre-service teachers’ accounts related to the role of teacher educators. In general, the participants held a positive view of teacher educators’ work. They stress their quality, the guidance and support provided by them, their commitment and availability and the quality of the interaction between pre-service teachers and their educators.

One of the most positive experiences related to the good interaction with some teacher educators. They are there for you, and their teaching is really relevant for your training as a teacher to be. They have shown different ways of doing teaching and research on teaching. (ST3)

In general, I think one positive feature is the good quality of teacher educators. (ST31)

I would like to stress the commitment and support from teacher educators in different subjects and modules. (ST33)

You can tell that some teacher educators are committed to their work and they want to support and guide you the best they can. (ST35)

I think the most important feature is the good guidance provided by teacher educators and also the opportunity to share experiences with them. (ST41)

However, some participants also identified negative features in regard to teacher educators’ role. They spoke of the poor work of some teacher educators which they relate to the lack of scientific preparation and skills and difficulties in communicating with pre-service teachers; the lack of guidance and support and the lack of articulation among them and in their practices during the training programme. They also referred to the poor quality of feedback. This supports earlier research which has identified difficulties related to supervisors’ role and feedback (Al-Barakat, 2003; Al-Hassan et al., 2012; Flores, 2014).
I think that some teacher educators do not care for you as pre-service teachers and are not concerned with your future as teachers. (ST3)

The most negative aspect relates to the lack of guidance and of clear assessment criteria to assess your work in the modules. (ST17)

Some teacher educators are too demanding, but there is something missing in their teaching. (ST20)

Organisational Aspects and Structure of the Programme

With regard to the organisational aspects and structure of the programme, pre-service teachers highlighted the good facilities, the adequate workload and the timetable. These two last issues are mainly related to the first year of the programme. However, some participants identified the structure of the ITE programme as a negative feature due to the lack of coherence and connection of the subjects and modules and between these and the teaching practice in the second year of the programme. The schedule of the given modules, especially in the second year, and the heavy workload are also mentioned by most of the participants. This is associated with the number of modules that pre-service teachers have to undertake in the second year at university while they are on teaching practice placement at schools. This represents a burden for them to comply with all the demands of both components which pre-service teachers also relate to their lack of articulation. In other words, the modules that are expected to support their teaching practice in the second year often imply doing extra work without any kind of connection with their pedagogical project in schools.

I think that the most positive issues are the adequate facilities, the city where the university is located and support facilities. (ST19)

The existence of several modules in second year of the programme means confusion and heavy work load for you. (ST15)

Teaching and Learning Methods

Teaching and learning methods was another recurring dimension emerging from pre-service teachers’ accounts. In general, they highlighted the diversity of teaching and learning methods within the formal curriculum of their ITE programme and the research and reflective component, which is one of the key issues of the new curriculum of ITE after the restructuring process. Pre-service teachers are expected to acquire research and reflective competencies which are to be developed throughout the programme. These are to be mobilised during the design and development of their pedagogical project in the context of their teaching practice in the second year of their studies.

I think that one of the major features of the programme is the diversity of teaching and learning methods. (ST15)

The most important thing is the possibility of reflecting pedagogically and methodologically on issues related to teaching and to the content of the subject matter that you are going to teach. (ST21)
In my opinion, the key issues of the programme are the concern with the methodological component; the provision of a large cultural background and the modules where there is discussion and analysis of what is happening in schools at the moment. (ST23)

The main positive features are the contact with schools’ reality, teaching of didactical sequences, collaborative work and a strong emphasis on the research and reflective component. (ST28)

One of the key learning experiences for me was the questioning of several teaching methods and their influence on pupils’ leaning. (ST44)

However, two negative issues were also identified. Inadequate teaching methods from the part of some teacher educators and the lack of pre-service teachers’ autonomy emerged from their accounts.

I think that sometimes there is lack of information and some inconsistencies which are to be related to the lack of coordination among teacher educators and the lack of pre-service teachers’ autonomy. (ST33)

My main criticism relates to the poor approach to teaching from the part of some teacher educators, the irrelevant academic work and assignments in some subjects/modules. (ST39)

Suggestions for Improvement

In their accounts pre-service teachers provided many suggestions to improve the quality of the ITE programme. In general, they spoke of issues related to curriculum content and organisation, teaching practice, teacher educators, assessment and organisation aspects. With regard to curriculum content and organisation, the participants highlighted the need to rethink the sequence of given study courses/modules, to review the importance and content of given study courses/modules and to improve their practical component. They stressed the need for a greater articulation amongst study courses/modules, a better clarification of the programme and a more rigorous and clearer content for given subjects and modules.

Regarding teaching practice, they stressed the need to increase the number of hours dedicated to teaching, greater articulation between teaching practice and the study courses/modules in the second year of their studies and a better organisation of the teaching practice. Pre-service teachers think improvement is needed concerning the work of some teacher educators. In particular, they highlighted the necessity for greater articulation in their practice, for greater support and for better clarification and coordination of the programme, especially as far as the modules of the second year of their studies are concerned. Issues related to assessment and organisation of the programme were also identified, specifically the need to review the assessment methods and criteria, more control on pre-service teachers’ assiduity, reducing the workload and improving the schedule in the second year of their studies.

I think that the second semester of the second year of my studies should be devoted only to the teaching practice. (ST13)
The study courses and modules should only be included in the first year of the programme. In the second year, the teaching practice and seminars are more than enough. (ST21)

I think that there is a need for a better organisation, because there are many inconsistencies in regard to the lack of coherence and articulation among study courses/modules. (ST27)

Teacher educators should meet in order to have a better coordination. Deadlines for handing in assignments should be defined in advance. (ST43)

In my opinion, the different modules need to be more articulated, and teacher educators should be more concerned with the work that is developed during the training programme. (ST44)

Teacher educators should organise their work better in order to get a better articulation between the modules and the teaching practice, especially with the pedagogical intervention project in the second year of the study programme. (ST47)

**Conclusion and Discussion**

This study set out to analyse the perceptions of pre-service teachers regarding their ITE programme. In general, they highlighted a number of positive issues which they relate to curriculum content, namely teaching practice and the role of teacher educators. Organisational aspects and teaching and learning methods were also referenced by the participants. In particular, they stressed the adequacy and relevance of study courses/modules, the interaction with supervisors and cooperating teachers, the opportunity to teach, the interaction of the pupils, the development of professional competencies, the quality of teacher educators, the guidance and support provided by teacher educators and their commitment. Other issues are associated with the diversity of teaching and learning methods they experience during their ITE programme and the research and reflective component along with good facilities.

However, a number of negative features were also identified, particularly the lack of connection between given study courses/modules, the gap between theory and practice, duplication in content, the length of the teaching practice, the lack of articulation between university and school, the lack of coordination amongst departments, supervisors and coordinators of the teaching practice and the mismatch between given study courses/modules in the second year of the study programme and pre-service teachers’ needs during their teaching practice. Regarding the role of some teacher educators, the participants highlighted the lack of guidance and support, the lack of articulation between some of the components of the programme and the poor quality of feedback from some teacher educators. They also discussed the structure of the ITE programme and the heavy workload in the second year of the study programme.

These findings resonate with earlier research (Al-Barakat, 2003; Al-Hassan et al., 2012; Flores, 2000; Flores, 2014; Flores & Day, 2006) and raise implications for improving the ITE programmes. In general, more attention needs to be given to the adequacy and coherence of the various components of ITE programme and the ways in which teacher educators view their work and role. This may be approached through careful
programme design, elaborated view of the intended process of teachers’ learning, specific pedagogical approaches and investment in the quality of staff members (Korthagen, Loughran, & Russell, 2006). It further implies a reflective and articulated work on the part of teacher educators in order to make their views and beliefs about teacher education, teaching, learning and being a teacher educator more explicit (Flores, 2014). In this regard, it is worth noting that a group of teacher educators has been involved in a study group to analyse their institution’s training model and to discuss and disseminate training practices. The aim is to develop a research culture on and in ITE, a scholarship of teacher education to better understand what and why teacher educators undertake given practices as well as questioning their rationale and their implications (Flores et al., 2014).

A closer relationship between university and school needs to be explored further to enhance the potential of the teaching practice. While each entity has different views, perspectives and practices regarding teaching practice, it is recognised as a key element in ITE (Flores et al., 2014). This improved relationship may well contribute to better articulation between theory and practice in ITE. The gap between theory and practice has been identified in the literature as one of the main challenges in teacher education (Elstad, 2010; Korthagen, 2010). In this regard, pre-service teachers’ beliefs and previous experiences should be made visible, analysed and challenged (Paulin as cited in Malm, 2009). As Flores (2001) states, learning to teach “is a process that goes beyond the mere application of a set of acquired techniques and skills. Not only does it imply the mastery of practical and more technical issues, but it also encompasses the construction of knowledge and meaning in an ongoing dialogue with the practice” (p. 146).

Participants in this study identified two key elements in the new curriculum for ITE in the Portuguese context – the reflective component and the research component – as positive features. However, the development of these components need to be made more explicit and articulated with the other dimensions of the programme. According to Contreras (1997) and Zeichner (1993), being a teacher means having not only technical knowledge and skills, but also having critical and reflective ideas about the teacher’s professionalism. In this context, Loughran (2009) highlights the relevance of the relationship between research on teaching and teaching research in teacher education as key aspects in order to move forward both teaching and teacher education and to encourage all participants to value more the nature of their work. Cochran-Smith (2005) asserts that a consistent vision, strong collaboration between universities and school/community fieldwork, and effective use of certain teacher education strategies are amongst the distinctive features in ITE programmes and will allow the reflective and research components to be developed.

It is then important to emphasise the professional logic within ITE (Formosinho, 2009) which implies the assumption of the role of teacher educators and a greater attention to the professional context and to the professional dimensions of their teaching (Flores, 2011). Opportunities for professional development should be provided to teacher educators in order for them to analyse and reflect on their practices and on their role in order to foster, in turn, more significant opportunities for the development pre-service teachers’ professional identity within ITE. This has been the focus of a group of teacher educators who have been engaging in a study group in order to analyse and to reflect in a more systematic way not only on their practice in line with the self-study perspective, but also on the current ITE model (Loughran, 2009; Lunenberg, Zwart, & Korthagen, 2010). This may well contribute to overcome some of the limitations of the current
model in order to “support the link between experience and theory in ways that are responsive to the expectations, needs and practices of teacher educators and student teachers” (Korthagen et al., 2006, p. 1037).

References


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Abstract
Finding a balance between a centralised and decentralised curricular policy for general education and seeing teachers as autonomous agents of curriculum development is a recurrent issue in many countries. Radical reforms bring about the need to investigate whether and to what extent different parties – and first of all, teachers – are ready to accept and internalise the new policies and roles as curriculum leaders to ensure the sustainability of curriculum development. The purpose of this paper is to describe the development of a questionnaire for investigating Estonian teachers’ curricular work and preferences and to introduce the results of its piloting. The main topics covered by the questionnaire are teachers’ experience and autonomy in using and developing curricula, their preparation for curriculum development and preferences and expectations for the best curricular solutions. The developed questionnaire can be used for investigating teachers’ curricular work and preferences in different national contexts, thus enabling comparative studies across countries with different practices regarding curriculum policy. Keywords: curriculum, curriculum development, teachers’ autonomy, general education, questionnaire

Historically, the official status, form, content, structure and development of curricula have had very different traditions in different countries. In Europe, countries such as the Netherlands and Denmark have been known as examples of the most decentralised curricular policies, meaning that schools and individual teachers have had nearly unrestricted authority to decide on the content and teaching methods (Egelund, 2005; Nieveen & Kuiper, 2012). In Norway, Sweden and France, the central state level has long exercised great power over the main curricular decisions (Lundahl, 2002; Nilsen, 2010; Schubert, Hansen, Wulf, Kliebard, Lawton, Connell, & Zhang, 1998). Traditionally, strict and prescriptive curricula are used in East Asian countries like China, Japan, South Korea and Taiwan (Kennedy, 2010). In the former Soviet Union, including Estonia and Latvia, the curricula were highly centralised for almost 50 years, and teachers have had autonomy in curricular decision-making only since the 1990s (Krull & Trasberg, 2007; Zogla, 2001).
Due to the globalisation and internationalisation of educational studies during the last decades – particularly in the form of international comparative studies on learning outcomes (Programme for International Student Assessment [PISA]; Trends in International Mathematics and Science Study [TIMSS]) – attempts have emerged to homogenise curricular policy in different countries. Sometimes this policy is called “decentralised centralism” (Karlsen, 2000). The attempt to combine the best practices of both centralisation and decentralisation causes on-going changes in curriculum policy (Nieveen & Kuiper, 2012). These changes bring about the need to investigate teachers’ readiness to accept and internalise the new policies as they are the main consumers and promoters of new curricula in democratic societies.

The aim of our study was to develop and pilot a questionnaire to investigate general education teachers’ involvement in the development of curricula and teachers’ expectations for different curricular solutions. The article introduces the theoretical background, problems, and possibilities related to elaboration of the questionnaire and the main results of its piloting. The broader aim of this study is to provide a data-gathering instrument which can be used for international comparative studies on the curricular thinking of teachers in countries with different curricular policies and traditions.

Theoretical Background

Research on the Curricular Thinking of Teachers and Their Involvement in Curriculum Development

The need for investigating teachers’ curricular preferences is related to their reported dissatisfaction with the present curricular policy, especially concerning the balance between centralisation and decentralisation of curricular policy in many countries. This particularly concerns countries such as Estonia, Latvia and other former Soviet states, where curriculum development was highly centralised for decades. Since the collapse of the Soviet Union, teachers and schools in these countries often faced a new but controversial situation. On the one hand, they enjoyed unprecedented autonomy in curriculum development, while, on the other hand, they were not prepared to take this responsibility as the know-how and traditions of local curriculum development were lost in the Soviet period. The new situation meant an increased workload and uncertainty for teachers due to their lack of preparation for curricular decision making (Olek, 1998; Polyzoi & Cerna, 2001; Zogla, 2001). Interestingly, however, similar results have been reported from countries outside Eastern Europe that have also taken measures to reduce the level of centralisation in their curricular policies – such as Sweden (Lundahl, 2005), China (Wong, 2006, 2008), Hong Kong (Lam & Yeung, 2010) and Australia (Kirk & MacDonald, 2001).

The level of centralisation of curriculum policy as well as the structure and level of specificity of curricular documents are continuously changing everywhere. In Northern countries, many changes in the content, structure, and emphases of curricula have occurred since the early 2000s. In Denmark and Norway, the emphasis has moved from description of learning content and activities towards specification of learning objectives and outcomes. In contrast, Finland has moved towards a more centralised and prescriptive national curriculum from 2004 (Sivesind, 2013). In Latvia, curriculum policy has remained largely centralised and still combined with teachers’ professional autonomy (Catlaks,
2003). Greater emphasis on the integration of subject studies and the acquisition of basic skills – instead of overloading pupils with factual materials – have been important changes characteristic of Latvian curriculum policy in recent years (Eurydice, 2007).

The critical role that teachers play as implementers and developers of curricula has prompted extensive international studies from different perspectives. The teacher’s identity and the influence of teachers’ attitudes and understandings of the success of educational reforms have been investigated in different countries (Craig, 2006; Drake & Sherin, 2006; März & Kelchtermans, 2013; Shkedi, 2006; Vulliamy, Kimonen, Nevalainen, & Webb, 1997; Wallace & Priestley, 2011). Also, formation of teacher identity related to curricular reforms (Handler, 2010; Sloan, 2006), the teacher’s autonomy in making curricular decisions (Wermke & Höstfält, 2014), teachers’ ratings of the decentralisation of curriculum policy (Lundahl, 2005; Osei & Brock, 2006; Wong, 2006, 2008), the influence of participation in the development of school curricula on teachers’ professional development (Law, Galton, & Wan, 2007; Priestley, Edwards, & Priestley, 2012), teachers’ curricular beliefs and conceptual approaches in developing and implementing school curricula (Shawer, 2010; Van Driel, Bulte, & Verloop, 2007, 2008) and teachers’ opinions of the possibility of implementing different aspects and components of curricula (Shkedi, 1998; Shriner, Schlee, & Libler, 2010) have been studied extensively.

However, most of the listed studies are qualitative by nature, paying great attention to the specificities of a particular context but offering limited room for rigorous cross-contextual comparison. Large-scale surveys of teachers’ curricular beliefs have been rather rare and conducted mainly within the framework of specific subject areas (Ennis & Hooper, 1988; Van Driel et al., 2007, 2008), thus not treating curricula as integral wholes along with general principles and guidelines of the overarching subject syllabi. One notable exception is the teachers’ curricular orientation questionnaire developed by Hong Kong researchers, which demonstrates the possibility of developing an instrument for international comparative research in the field of curriculum studies (Cheung & Wong, 2002). This instrument has been used in different countries and contexts. For instance, Jenkins (2009) used it to investigate teachers’ curricular orientations in the United States of America.

A substantial prerequisite for developing an applicable survey instrument for cross-national comparison of teachers’ curricular beliefs is the determination of certain common elements present in the curricular documents of most or many countries. Given that there is an enormous diversity in the world’s countries regarding how general education curricula are determined and structured, the determination of common curricular components or dimensions, is essential for enabling description of a particular national context against the background of an internationally comprehensible system and terminology.

In generalising from the approaches of Tyler (1949), Taba (1962), McNeil (1992) and other recognised approaches, Eash (1991) provides five curriculum components or dimensions typically present in all curricula. These are a) a general understanding of the learner and society; b) aims and objectives of the curriculum; c) form, selection and principles of subject matter content; d) transaction principles and modes – instruction and learning environment methodologies and e) forms and principles of assessment. Eash (1991) emphasises that proportion, level of precision, structure and other aspects of these components differ in various approaches. While elaborating the research methodology and the questionnaire for the current study, we kept Eash’s classification and the concepts underlying it in sight.
The Estonian Context

Since regaining the national independence in 1991, the first attempts to introduce national curricula for general education were made in Estonia in 1992 (Unt & Läänemets, 1992) and 1993 (Unt & Läänemets, 1993), but these documents were not granted an official status. The first version of the national curriculum that principally differed from the curricula of the Soviet period and whose main principles and ideology followed in the next two versions of national curricula was introduced in 1996.

All the three versions of Estonian national curricula of general education established in 1996, 2002 and 2011 (Eesti põhi – ja keskhariduse riiklik õppekava [Estonian national curriculum for basic and secondary education], 1996; Põhikooli ja ülemhariduse riiklik õppekava [National curriculum for basic schools and gymnasia], 2002; Põhikooli riiklik õppekava [National curriculum for basic schools], 2011) consist of the general part and subject syllabi. The general part provides information for all the categories of curricular components identified by Eash (1991).

Subject matter content, learning objectives, detailed goals and objectives of studies, principles for formation of general competences in subject areas, possibilities for integration with other subject areas, principles for treatment of cross-curricular themes, expected learning outcomes, assessment criteria and procedures and requirements for the learning environment are reflected in the subject syllabi.

The main innovations in Estonian curricula since regaining the national independence have been a comprehensive methodology for integrating instruction, a concept of general competences and guidelines for designing school curricula.

It is curious that throughout the period since the first version of the Estonian national curriculum was introduced, its main components, including the guidelines for compiling school curricula, have remained essentially the same and have not changed significantly towards greater school and teacher autonomy. How is it possible that these unchanged principles satisfy the expectations of the educational authorities responsible for curriculum development as well as the expectations of schoolteachers? Are teachers still used to a top-down way of thinking? One of the main goals of the current research is to obtain answers to these questions.

Research Methodology

Development of the Questionnaire

We were interested in how Estonian teachers see their responsibility and autonomy in curricular issues. We attempted to develop a research instrument to discover teachers’ attitudes towards existing curricula and procedures for curriculum development at the national and school level, as well as teachers’ expectations of ideal curricular solutions. The questionnaire was developed following the generally accepted principles of questionnaire design summarised by Wolf (1997).

As the first step in the development of the questionnaire, a model of factors affecting teachers’ use, development and thinking about curricula was created. These factors were conceived in the light of Eash’s (1991) five major curriculum concepts or components introduced above. Next, the main potential variables representing or characterising these factors were defined. Thereafter, initial questionnaire items for gathering data on
these variables were compiled and collected into four parts of the questionnaire. The following subsection introduces the structure of the questionnaire as it resulted from the validation procedures.

The Structure and Nature of the Questionnaire

The first part of the “Questionnaire on the General Education Curriculum and Its Development” was designed to collect the necessary data on respondent demographics, such as gender, age, marital status, qualification, teaching experience, workload and initial training. It consisted of eight items using multiple-choice and four using a short answer and completion format. The second part was entitled “Experiences Related to Using Curricula” involved eight multiple-choice and six short answer and completion items and two sets of questions in a Likert-type format. It started with questions about the role that national and school curricula play in respondents’ everyday teaching and their opinions about the quality of those documents. A nine-item Likert-type set of questions in this part asked the respondents to express their opinion on the quality of some curriculum components presented in the general part of the national curricula currently in force, called the “Curriculum Components Rating Scales”. The curriculum components, evaluated on seven-point Likert measurement scales (completely unsatisfactory, unsatisfactory, rather unsatisfactory, neutral, rather satisfactory, satisfactory, completely satisfactory) were:

- statement of educational objectives;
- notion and categorisation of competences expected of students;
- concept and selection of cross-curricular themes;
- concept of learning;
- principles of organising instruction;
- principles for selection of instructional methods and creating a learning environment;
- description of instructional and educational activities by school levels;
- principles of assessment;
- guidelines for compiling school curricula.

In the second part, we also asked the respondents to express their opinion on the extent of their own participation and experiences in the development of the school or national curriculum. Finally, the last item asked the respondents to evaluate the influence of their participation in the development of the curricula both at the national and school level using the five-point Likert measurement scales (very great, great, neutral, rather small, very small).

The third part of the questionnaire was designed for studying the respondents’ preferences for oppositional curricular solutions. We included 14 items, using semantic differential measurement scales called “Optimal Solutions Scales” (Figure 3). The definitions of oppositional curricular solutions were mostly based on statements drawn from contrasting views on the following aspects: a) the relationship between the general part of the national curriculum and the subject syllabi; b) the relationship between national curricula and school curricula and c) the dilemma of teachers’ autonomy in curricular decision-making. Typically, at the one end of the scales, statements were given reflecting current solutions or descriptions of situations in the versions of national curricula, and, at the other end, opposing, alternative solutions were given. For instance, one of these
items asked the respondents to find the proper balance between the statements: *The most helpful school curriculum in my work is the one that* (at the one end) *rigorously follows the methodological recommendations and prescriptions of the national curriculum* and (at the other end) *is relatively free of recommendations and prescriptions of the national curriculum.*

The last part of the questionnaire, “Expression of Opinions”, consisted of three short answer and completion items that asked the respondents to make unstructured suggestions for improving the curriculum development and its organisation at the local and national levels.

Altogether, 27 questionnaire items from 45 in the questionnaire were provided with spaces for commenting or for giving alternative answers. The content validity of the questionnaire was ensured in two stages. Firstly, the structure of the questionnaire and versions of its items were analysed by the research group members, consisting of five lecturers teaching courses of educational disciplines and researchers, including specialists in curriculum studies. Secondly, different versions of the questionnaire were compiled for improving its quality (in terms of aims, numbers, types and statements of questionnaire items), and, after being approved by the majority of the research group members, the best version was chosen for testing and commenting with a small group of experienced teachers (having teaching experience at least ten years and representing teachers of different school subjects and levels). Suggestions for making the questionnaire more teacher-friendly and relevant were requested of the teachers. Typically, the experts were asked to fill in the questionnaire along with commenting on problems they noticed and suggesting modifications for the draft. After the suggested modifications were taken into consideration, the pilot version of the questionnaire was considered ready for piloting with a small sample of teachers not involved in the validation of the draft.

**Piloting of the Questionnaire**

The piloting of the questionnaire was carried out in March of 2012. A convenience sample was composed of teachers from three local schools in Tartu, the principals of which our research assistant had personal contact. This provided the easiest access to a big number of teachers with relatively modest financial means. Considering the smallness of Estonia as a country, high level of urbanization and availability of the same television channels and the Internet in the most remote areas, we did not expect relevant regional differences in teachers’ curricular thinking and, therefore, did not see a need for piloting this questionnaire in different areas of the country.

The teachers in the piloting sample were chosen so that the major subject groups – teachers of social sciences and humanities, natural sciences and mathematics and class teachers – were represented in equal proportions. Teacher participation was voluntary. Of 150 questionnaires distributed to teachers, 103 completed questionnaires were returned. 35 questionnaires were returned by teachers of social sciences and humanities, equally 34 by teachers of sciences and mathematics and class teachers. 86% of the respondents were women. The age of the respondents ranged from 23 to 66 years, with an average of 45. The teaching experience of the respondents ranged from zero to 44 years, with an average of 21 years. The weekly work load of the respondents remained between 23 to 26 hours for 54% of the respondents. The average work load of the respondents was 22.6 hours.
The average time spent for filling in the questionnaire was 38 minutes with a maximum of 120.

Data Analysis

Depending on the nature of data, procedures of both quantitative and qualitative data analysis were used. The quantified data were analysed using procedures of descriptive and inferential statistics. The internal reliability of the scales was determined and item analysis was executed for ensuring the acceptable coherence of these scales. Also, the factor analysis of the Optimal Solution scales was conducted. The open answers and comments were analysed mostly using procedures of qualitative content analysis.

Results

Teachers as Users of Curricula

When asked to estimate to what extent the national curriculum and school curriculum had been helpful as guidelines for teaching, the majority of the respondents (56 and 58%, respectively) found that they had been helpful in some way, and close to a third (32 and 39%) – that they had been most helpful. 60% of the teachers found the importance of national and school curricula as guidelines for teaching to be about the same. However, 25% of them answered that they relied only on school curricula as guidelines, in contrast to 11% of teachers who relied solely on the national curriculum. When asked to characterise to what extent national or school curricula were empowering or limiting their decision-making freedom, the majority (70 and 74% respectively) of the respondents replied that the curricula did not empower or limit their decision-making freedom. The percentage of those who found these documents to restrict or increase their freedom remained between 11 and 13%.

Teachers gave their ratings on the curriculum components covered by general parts of the 2002 or 2011 national curriculum on the Curriculum Components Rating Scales. By definition, the items in the scale were designed to give ratings to curricula that teachers were actually using, as due to the transfer period, the 2002 and 2011 curricula were simultaneously in use. However, against our expectations that teachers would choose to characterise one of these two curricula, the majority of teachers actually gave ratings to both versions. The solutions of the 2011 curriculum received higher ratings on seven items out of nine.

Teacher Experience in Curriculum Development

Answers to the items in this section of the questionnaire gave some ideas as to how teachers assess their preparation for curriculum work and how they perceive their real participation and influence on this work. 43% of the respondents answered that they had received some preparation for curriculum development, and 41% – that they had had sufficient preparation for participation in curriculum development. About 80% of the respondents claimed to be involved in the development of the national or school curricula.
Investigating Estonian Teachers’ Expectations for the General Education Curriculum

Figure 1. Teachers’ involvement in curriculum development as percentages depending on their teaching experience

However, data analysis revealed that only 25% of the beginning teachers admitted participation in curriculum development activities (Figure 1). When asked to estimate their potential impact on the development of the curricula, about 15% of the teachers found that they had a very significant or significant impact on the development of general parts of national curricula, 60% – found that their impact to be rather insignificant or insignificant (Figure 2). However, about 65% of the respondents claimed that they had a significant impact on the development of school curricula.

Figure 2. The distribution of teachers’ estimations of their real impact on the development of the curricula as percentages (from the total number of answers)
Teachers’ Perceptions of Optimal Curricular Solutions

The third part of the questionnaire studied teachers’ perceptions of optimal curricular solutions on *Optimal Solution Scales*. 14 items were constructed as oppositional alternatives to the main curriculum components. To obtain a better picture of the respondents’ preferences, their replies were dichotomised in data processing. This procedure revealed that there were clear preferences for solutions in answers to 11 items (Figure 3) (see figure 3 on the next page). As for the three items are concerned, (items 1, 5 and 13), the respondents’ preferences were almost equally distributed between opposing solutions, and there was no statistical difference between the corresponding pairs of percentages (at a significance level \( p < 0.05 \)).

Findings Based on Qualitative Content Analysis of Open-ended Answers to the Questionnaire Items

The biggest problems in using curricula listed by the respondents were the lack of study aids, shortage of time and overloaded the subject syllabi.

There was a lot of variety in teachers’ replies to the item asking them to define in their own words what they meant by curriculum. One group of teachers defined it as a plan or framework – all pointing to its primary nature as a guideline. Another group of answers pointed to its normative character – regulations, prescriptions and a set of requirements. The third group of teachers conceived it as an instructional aid that guides and helps teachers. The fourth group defined curriculum as a document reflecting instructional goals and objectives to be achieved. The fifth group of teachers defined it as a collection of themes and list of contents.

The diversity in the teachers’ definitions of curriculum shows that their understanding and knowledge in the curricular field varies, and common ground could be useful in finding better solutions.

The most negative features of curricula for the respondents were overloaded syllabi, over-expanded requirements for integrating instruction and teaching using cross-curricular themes and unrealistic requirements for the learning environment. These statements show that much work needs to be done to make the curriculum usable for teachers. It is not enough to list cross-curricular themes and general competences, but there is also a need to show how these themes and competences should be treated in subject syllabi.

The most positive features of curricula were the principles of integration and assessment, creativity, orientation to thinking and sufficient space left for decision-making at the school level. These statements are promising – teachers value the new orientation of teaching, learning and autonomy towards decision-making.

The most positive experiences for teachers as curriculum designers were teamwork and cooperation, being thoroughly informed about the curricular solutions, and the feeling of personal usefulness. On the negative side, the teachers pointed out difficulties in reaching agreements and a lot of unpaid work and invested time. The fact that the teachers valued the feeling of personal usefulness and teamwork with colleagues is rather promising. Could it be that they have had too few opportunities to participate in curriculum development and are not used to taking it as an integral part of their work, but rather see it as unpaid extra work?
### Figure 3. Dichotomised distribution of teachers’ preferences for oppositional curricular solutions as percentages

<table>
<thead>
<tr>
<th>Preference</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A school curriculum that strictly follows methodological recommendations of the national curriculum</td>
<td>39%</td>
</tr>
<tr>
<td>2. In addition to listing the content to be taught, provides methodological guidelines for instruction and general principles of education to be observed</td>
<td>69%</td>
</tr>
<tr>
<td>3. Is provided with a whole set of compulsory textbooks, workbooks, and other methodological means</td>
<td>71%</td>
</tr>
<tr>
<td>4. Does not provide hidden or unstated educational objectives</td>
<td>51%</td>
</tr>
<tr>
<td>5. Is limited to giving guidelines for instruction in lessons</td>
<td>43%</td>
</tr>
<tr>
<td>6. Gives teachers a lot of autonomy in instrumental and educational decision making</td>
<td>69%</td>
</tr>
<tr>
<td>7. Is one in which components and solutions have been tested in practice before being legitimised</td>
<td>82%</td>
</tr>
<tr>
<td>8. Is one in which syllabi do not go into excessive detail and provide objectives to be achieved by the end of the grade or school level and allocated number of lessons for subjects</td>
<td>53%</td>
</tr>
<tr>
<td>9. Includes a traditional general part for providing overall educational goals for all subject fields</td>
<td>82%</td>
</tr>
<tr>
<td>10. Defines general competences to be achieved as a result of teaching different subjects and other educational activities</td>
<td>66%</td>
</tr>
<tr>
<td>11. Prescribes cross-curricular themes treated in different subjects for developing general competences</td>
<td>83%</td>
</tr>
<tr>
<td>12. Introduces cross-curricular themes and competences to be achieved by treating them as mutually defined entities</td>
<td>85%</td>
</tr>
<tr>
<td>13. Presents detailed educational objectives that allow achievement to be observed</td>
<td>39%</td>
</tr>
<tr>
<td>14. Is one in which the general part introduces major concepts of learning that are expected to be helpful in selecting the appropriate instructional methods</td>
<td>65%</td>
</tr>
</tbody>
</table>

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**The ideal curriculum...**

- is a school curriculum that strictly follows methodological recommendations of the national curriculum
- lists the content to be taught and does not provide methodological guidelines for instruction and general principles of education to be observed
- leaves freedom of choice in selecting textbooks and other study aids to teachers
- provides hidden or unstated educational objectives to ensure general educational objectives are attained
- gives guidelines for out-of-class and out-of-school activities as well
- gives teachers detailed prescriptions for instruction
- is one in which components and solutions are developed by experts and made compulsory for schools
- is one in which syllabi go into excessive detail and provides the content to be taught, instructional methods and principles of assessment
- is limited to providing separate introductions for subject fields
- does not define general (key) competences to be achieved as result of studying different subjects, because the achievement of these competences is not controllable
- does not prescribe cross-curricular topics to be treated in classes on different subjects, because it limits teacher autonomy in decision making
- introduces cross-curricular topics and competences to be achieved independently and separately
- presents educational objectives in general terms as the achievement of these objectives is beyond control
- does not introduce the main learning theories as teachers proceed in their decision making rather from their own experience than from theories
To create a curriculum that is most effective for the everyday work of teachers, they proposed involving practitioners, ensuring financial and other resources, trying out new curricula in pilot schools and providing teachers with more methodologies and examples. These statements show that teachers are not yet ready to create their own instructional materials and need more materials, examples and methodologies to choose those that are the most appropriate and suitable to their needs.

**Analysis of the Results of the Piloting**

Practically all sections of the research instrument needed some modification. Especially, this concerns the used scales for rating curriculum components and expressing preferences of curriculum solutions. The both of them were submitted to the item analysis for increasing their internal reliability. In the questionnaire, the Curriculum Components Rating Scales played a central role in revealing teachers’ thoughts about the 2002 and 2011 national curricula. As its internal reliability revealed by the item analysis was good (Cronbach alfa 0.90), we left this component of the questionnaire unchanged. Still, some modifications were made in the format and location of the questionnaire items.

The item analysis of optimal solutions scales showed that the reliability of this component of the questionnaire was not sufficient. Of course, more diversity in the teachers’ preferences for ideal curriculum solutions and, also, in their understanding of proposed solutions could be expected. Gradual elimination of weakly correlated items until achieving the reliability index of Cronbach alpha 0.70, considered to be satisfactory (Fraenkel & Wallen, 2010), forced removal of half of the initial measurement scales. The seven measurement scales, which harmonised with each other, included items 1, 4, 10, 11, 12, 13 and 14 (Figure 3). All of these items ask the respondents to describe their preferences between relatively prescriptive and restrictive curricular guidelines and those that allow teachers to make their own decisions. This block of items could be labelled “Expectations for Curricular Autonomy One”.

An analysis of the seven items initially eliminated from the set of 14 measurement scales allowed the selection of a combination of four items for which the reliability index reached the value of 0.72. This group of scales involved items 2, 5, 6 and 8 (Figure 3). This group of items describes, like the previous one, teachers’ preferences regarding curricular solutions ranging from very restrictive to those giving teachers a lot of autonomy. In comparison with the first group of items described above, this one seems to test teachers’ curricular preferences in more general terms without going into specifics. However, the distinction is rather vague, and this group was therefore labelled “Expectations for Curricular Autonomy Two”.

**Discussion and Conclusions**

On the basis of the pilot study results, modifications were made in almost all parts of the questionnaire. Most changes were made in the items presented on the optimal solutions scales. Satisfactory reliability was achieved by creating two subscales, eliminating two items and rewording the remaining items.

The analysis of findings also supplied valuable information for compiling a representative sample of teachers. Firstly, it revealed that by subject field, different teachers’
groups (social sciences and humanities, sciences and mathematics and class teachers) had somewhat different work experience and consequently different understandings of curricular guidelines. Secondly, the study pointed out that teachers’ involvement in the development of the curriculum depended on their teaching experience. The conclusion for a further study is that, in order to be representative, the sample of teachers should be stratified in terms of teachers’ subject groups and experience groups.

The results of this study provided many indications of Estonian teachers’ satisfaction with the existing curricula, their involvement in developing curricula and their expectations seen from the perspective of teachers’ perceived autonomy as curriculum users and developers. Many of these findings represented controversial information about the relationship between national and school curricula seen by teachers as users of these curricula. Most of the respondents were satisfied with the 2011 national curriculum in general and revealed that the national and school curricula have been helpful as guidelines for teaching.

The analysis of teachers’ expectations of ideal curricular solutions was more informative for understanding teachers’ readiness to act as autonomous developers of curricula. Their readiness and willingness for autonomous instructional decision-making, as opposed to preferring detailed guidelines and mandated study aids for teaching, was reflected by three items of the optimal solutions scales. In these items, the respondents expressed support in almost equal percentages for greater autonomy in teachers’ decision-making and for having prescriptive and detailed guidelines in instruction. The teachers’ perception that the school curriculum increased their freedom of instructional decision-making correlated positively with mutually exclusive preferences for greater autonomy and control. From the 11 items that were retained in the modified scale after the item analysis, two items (Figure 3) clearly expressed teachers’ preferences for prescriptive curricular guidelines. In contrast, item 6 expressed teachers’ preference for a curriculum that assumed teachers had greater autonomy in educational decision-making.

The answers to the remaining eight items (3, 4, 7, 9, 10, 11, 12 and 14) reflected teachers’ preferences for comprehensiveness and the integrity of curricular guidelines and materials.

From the last eight listed, items 3, 4, 7, 12 and 14 mostly reflect teachers’ wish to change the existing curricular solutions. Instead, items 9, 10 and 11 express fairly teachers’ support for curricular solutions that they have experienced since the 1996 national curriculum was introduced.

Many findings from teachers’ answers to the expectation scale were confirmed and supplemented by teachers’ open-ended answers to the questionnaire items. Thus, the respondents recalled that more attention was paid to proposals made by teachers and that new curricula, before being made mandatory, were tested. The variety in how teachers define curriculum shows the diversity in teachers’ preparation, knowledge and expectations, which should be taken into account by curriculum developers and teachers’ educators in finding common ground and “speaking” one language. It is not enough to state cross-curricular themes and competences to be achieved in the general part of the curriculum. Teachers need more guidance, examples and materials for integrating these into teaching their subject matter content.

The analysis and generalisation of the study results leads to the conclusion that the respondents’ preferences for greater autonomy in curricular decision-making and for having detailed guidelines and instructions to follow were almost equally distributed.
The majority of the respondents expressed a preference for the comprehensiveness and integrity of curricular guidelines, but, in reality, they mostly supported curricular improvements in the framework of curricular solutions that are characteristic of the national curricula that they have themselves experienced in their work. One possible explanation is that Estonian teacher education programmes do not provide beginning teachers with a basic knowledge of alternative approaches to instructional design and to providing curricular guidelines. Consequently, the majority of teachers, if they even see themselves as involved in the development of the curriculum at the national and school level, fail to propose solutions beyond those they have experienced and used themselves. The same applies to seeing issues of curricular autonomy and control by educational authorities at the national or school level. Therefore, the documented teachers’ expectations of national curricula mostly manifested a vague satisfaction with the limited autonomy in curricular decision-making, with few cases of dissatisfaction, but failed to propose constructive solutions to shortcomings.

The respondents would disagree with this conclusion as 43% of them claimed to have some preparation for curriculum development and 41% even had sufficient preparation for participation in these activities. But a large variation in defining what is meant by the term “curriculum”, as revealed by the qualitative content analysis of open-ended answers, does not support these claims. One explanation for this controversy could be that Estonian teachers are not quite aware of what independent curriculum development means. Moreover, they are not ready to take greater responsibility for instructional decision-making. Could it be that the majority of teachers in the former Soviet republics are still used to following prescriptive curricula and curriculum developers are used to seeing teachers rather as faithful implementers of an externally developed curriculum and not as autonomous consumers and decision-makers (Silberstein & Ben-Peretz, 1987) or curriculum leaders (Handler, 2010)? This might also explain why the nature of guidelines for compiling the school curricula in the national framework curricula has not progressed towards greater school and teacher autonomy. Although educational researchers and policy makers have adapted internationally acknowledged images of teachers as reflective, self-determining, life-long learning practitioners with high professional autonomy, the impact of national and historical contexts should be taken into account (Wermke & Höstfält, 2014). Consequently, in countries like Estonia and Latvia, more attention should be paid to the preparation of teachers for curricular policy making and instructional design in pre-service, but mostly in in-service teacher training. Teachers’ professional credibility in the eyes of curriculum developers should grow. Teachers should have more opportunities to participate in the development of curricula at the national and school levels in order to feel personal responsibility and ownership in these activities and to ensure the sustainability of curriculum development. It is promising that, in their open answers, teachers stated that participation in the development of the curriculum was mostly a positive experience due to cooperation and team work with colleagues. Perhaps it shows a readiness to participate and take more responsibility to become a curricular leader and informed professional. Lots of urgent questions still need to be answered: How do educational authorities at national level see teachers as curriculum developers and how is this reflected in the general parts and syllabi of national curricula? How are teacher training programmes treating curriculum theory and practice and the role of the teacher in it? What are school administrators’ views on teachers’ autonomy and their role in the development of curricula? Answering these questions
Investigating Estonian Teachers’ Expectations for the General Education Curriculum helps to understand the local contexts for developing curricula in order to make better decisions and ensure sustainable curricular development.

These conclusions are still preliminary, and more solid ones can be made after a more comprehensive study is conducted. The created questionnaire can hopefully be used as a prototype for developing a suitable data collection instrument allowing international comparative studies of teachers’ expectations for curricular policy and specific solutions.

Acknowledgement

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Teachers’ Facility with Evidence-Based Classroom Management Practices: An Investigation of Teachers’ Preparation Programmes and In-service Conditions

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Abstract

In the present investigation, teachers’ self-reported knowledge and competency ratings for the evidence-based classroom management practices were analysed. Teachers also reflected on how they learned evidence-based classroom management practices. Results suggest that teachers working in schools that implement Positive Behavioural Interventions and Supports (PBIS) had significantly higher mean knowledge ratings in the area of posting, teaching, reviewing, monitoring and reinforcing expectations than those who do not teach in a PBIS school. Teachers certified in special education had significantly higher knowledge and competency ratings in relation to maximising structure, using a continuum of strategies to acknowledge appropriate behaviour and employing a variety of techniques to respond to inappropriate behaviour than those not certified in special education. Teachers’ knowledge of each of these practices came mostly from in-service sources. Implications of these findings for teachers’ preparation in classroom management are discussed.

Keywords: classroom management, teacher education, special education, Positive Behavioral Interventions and Supports (PBIS), evidence-based

Recommended Practices for Classroom Management

For teachers to provide effective instruction that meaningfully resonates with students, the classroom environment must include skillful management of students’ task-related behavior (McIntosh, Chard, Boland, & Horner, 2006; McIntosh, Horner, Chard, Dickey, & Braun, 2008). Without adequate classroom management skills, the execution of an otherwise well-conceived lesson may be easily thwarted; one may ask, therefore, “If a teacher offers instruction without proficiency in classroom management, does student learning occur?”

Classroom management is a comprehensive construct defined as “...the actions teachers take to create an environment that supports and facilitates both academic and social emotional learning” (Evertson & Weinstein, 2006, p. 1044). Schools and the
classrooms within them, are crucial environments for prevention and early intervention efforts for students who experience problematic development with both academic and social-emotional behavior (Levine, 2006; McIntosh et al., 2006; Oliver & Reschly, 2007; Walker & Severson, 2002). Given the influence of such environments, effective classroom management must be part of the support regimen to foster desired learning and behavioural outcomes. Classroom management techniques need to be responsive as well as reflect best practice and theory. To provide effective supports using proactive and preventative logic, teachers must engage mindfully in evidence-based classroom management practices (Moore-Partin, Robertson, Maggin, Oliver, & Wehby, 2010).

In an extensive and rigorous review of the literature to determine evidence-based practices in classroom management, Simonsen, Fairbanks, Briesch, Myers and Sugai (2008) identified 20 key strategies. The five critical elements, herein referred to as subscales, of evidence-based classroom management are: 1) maximising structure; 2) posting, teaching, reviewing, monitoring and reinforcing expectations; 3) engaging students actively in observable ways; 4) using a continuum of strategies to acknowledge appropriate behavior and 5) employing a variety of techniques to respond to inappropriate behaviour. The operationalisations of the practices that comprise these five subscales are presented in Appendix A. Despite these known and proven strategies and actions, evidence indicates teachers often do not use these particular practices. Kennedy and Thomas (2012) have posited that a key reason teachers do not adopt evidence-based practices in classroom management is that their pre-service preparation in this domain is inadequate.

Pre-service Preparation in Classroom Management

Although instruction in classroom management has been identified as an essential component of pre-service teachers’ preparation (Auld, Belfiore, & Scheeler, 2010; Kennedy & Thomas, 2012), the inclusion of classroom management within required components of teacher preparation has been and continues to be inadequate (Levine, 2006; Oliver & Reschly, 2007, 2010). Across all elementary and secondary schools, formal, accredited higher education coursework is not a common source for learning and practicing classroom management skills (Smart & Igo, 2010); only 18% of teachers report that they learned the skills as part of their teacher preparation programme (Merrett & Wheldall, 1993), and only 27% of teachers’ preparation programmes offer an entire course on the topic of classroom management (Oliver & Reschly, 2010). The effects of sparse coursework in classroom management are compounded by insufficient opportunities to practice implementing strategies during field placements that offer direct instruction, coaching and feedback (Capizzi, Wehby, & Sandmel, 2010; Moore-Partin et al., 2010; Oliver, Wehby, & Reschly, 2011; Simonsen, MacSuga, Fallon, & Sugai, 2012; Simonsen, Myers, & DeLuca, 2010).

Researchers have indicated that there appear to be nuances in the preparation of general and special educators. General education majors have reported little to no preparation in classroom management, and the minimal preparation they do get in reinforcement basics is almost exclusively offered within special education courses (Brownell, Smith, McNellis, & Miller, 1997; Kennedy & Thomas, 2012; Tillery, Varjas, Meyers, & Collins, 2010). Within special education teacher preparation programmes, encouraging prosocial behaviour and reducing troubled students’ behaviour were emphasised, and
five percent of special educators reported having one entire class dedicated to classroom management as an undergraduate (Oliver & Reschly, 2010; Tillery et al., 2010). Therefore, a general education teacher may not receive coursework in classroom management to the extent that a special education teacher might.

**In-service Opportunities in Classroom Management**

Professional development (PD) within educational settings is an administrative investment in human capital so that knowledge and skills can continue to develop *in situ* (Leana, 2011). Teachers have persistently identified classroom management as an area for which they need additional on-site training that will establish or further develop skills not sufficiently addressed in pre-service programmes (Reinke, Stormont, Herman, Puri, & Goel, 2011; Tillery et al., 2010).

Teachers also report that they learn from colleagues as well as from outside experts while on-the-job and actually favor the former method (Frey, Park, Browne-Ferrigno, & Korfhage, 2010). Teachers reported consulting with a colleague or mentor to be a preferred method for learning new strategies (Clunies-Ross, Little, & Kienhuis, 2008; Tillery et al., 2010). Merrett and Wheldall (1993) found that 82% of teachers developed classroom management skills by encountering certain behavioural situations and then collaborating with peers to formulate solutions. Second only to students’ teaching, first-year teachers reported that trial-and-error classroom experience was the most common way classroom management skills were learned (Smart & Igo, 2010).

As part of the current reform efforts in schools, Positive Behavioral Interventions and Supports is a framework that organises effective supports for students’ outcomes (Horner & Sugai, 2000). The multi-tiered Positive Behavioral Interventions and Supports (PBIS) framework is evidence-based and emphasises proactively supporting all students. This model involves preventing difficulties by addressing environmental arrangements, teaching expectations, reinforcing appropriate behavior and extinguishing inappropriate behaviour. The PBIS framework also offers an operationalised structure for conceptualising the development and implementation with fidelity of a continuum of behavioural supports for all students as a means of scaffolding both instructional and social outcomes (Sugai, 2009). The multi-tiered dimension of the PBIS model encourages the intensity of service provided to match the intensity of the student’s needs. Effective classroom management practices, such as those previously noted, are at the universal level of PBIS.

**Factors Affecting Teachers’ Practices**

For teachers to be effective resources for one another regarding classroom management, they need to first possess reasonable capacity in this area. Although knowledge of an intervention strategy is a prerequisite to actually using the strategy, awareness of a strategy does not necessarily correlate with application of the strategy (Peters, 2009). As noted by Reupert and Woodcock (2010), the strategies that teachers use will be influenced by their perceived knowledge and competency with those strategies; that is, teachers often use strategies with which they consider themselves competent.
Teachers’ Knowledge of Strategies

Researchers have found that teachers who are skilled at classroom management address behaviour issues using both preventative and intervention techniques that empower students to grapple with the issues giving rise to the behavior (Brophy & McCaslin, 1992). Most teachers, however, self-report reliance on less effective practices such as aversive and reactive consequences (Tillery et al., 2010). Researchers have also indicated that teachers use a fairly limited range of classroom management strategies (Frey et al., 2010) focusing on reactive practices (Tillery et al., 2010).

Teachers’ Competency Using Strategies

Teachers’ confidence in their competency impacts their willingness to intervene with varying levels of students’ needs (Hamill & Dever, 1998). According to Reupert and Woodcock (2010), in-service teachers utilise classroom management practices in which they feel confident applying, even if other strategies had been shown to be more effective. In a study conducted by Westling (2010), it was found that the number of strategies teachers used to address troubling students’ behaviour and their confidence levels using such could be predicted by their pre- and in-service experiences (Westling, 2010).

Purpose

There is a distinct emphasis on teachers’ use of evidence-based practices in the education field today; however, little is known about teachers’ perceived knowledge of and competence in skill sets in classroom management that have been empirically shown to support students’ social-emotional behaviour. Furthermore, the questions of when and how such skills are learned were studied by the authors of the present investigation.

Methods

The sample for this investigation consisted of currently certified and practicing New York State public school teachers of grades K-12. In this particular study, within each of the 10 geographic regions, all school districts were assigned a number for random selection. Using a stratified sample, the prospective teacher e-mail addresses were selected for each region; all members of the sample received an e-mail inviting them to participate in the study with a link to the electronic survey. In order to give recipients of the survey maximum opportunity to respond, two rounds of e-mails were distributed for a final response rate of 11.4%. Other survey-based investigations reviewed suggested similar response rates for an online survey with no completion incentive from a sender that is personally unknown to recipients (i.e. 11% – in Merrett & Wheldall, 1993; 14.2% – in O’Neill & Stephenson, 2012).

In terms of participant demographics, 27.8% of the teachers who completed the survey reported that their current teaching assignment is in the K-5 grade range, 26.1% – at 6–8 and 44.3% – at 9–12. In terms of teaching experience, 11.3% reported 0–3 years, 12.2% had 4–6 years, 17.4% taught between 7–10 years, 20% had 11–14 years and 36.5% of the respondents reported 15 or more years of teaching experience. Teachers
with a bachelor’s degree represented 7% of the respondents, 75.7% had a master’s
degree, 2.6% earned a doctoral degree, 11.3% had a Certificate of Advanced Standing
(CAS), .9% were National Board Certified Teachers, and 1.7% had Administrator
certification. Special education certification was held by 35.6% of the respondents, and
48.2% reported working in a PBIS school.

The survey utilised in this study was “The Survey of Effective Classroom Manage-
ment Strategies”, which is a multi-item, forced-choice instrument and is available from
the first author. The strategies were based on the work of Simonsen et al. (2008), in
which evidence-based classroom management practices were ascertained. Psychometrics
disaggregated by scale and subscale are location in Appendix B.

Results

Teachers’ Knowledge and Competency with Evidence-Based Practices

Enumerated in Table 1 are the mean ratings for both knowledge and competency
for each evidence-based classroom management practice. Practicing teachers, on average,
reported their knowledge of evidence-based classroom management practices as being
between the low-medium and medium-high (range: 1.70–2.82). Specifically, teachers
reported being most knowledgeable about supervising classroom activities (X = 2.82)
but least knowledgeable about response cards (X = 1.70) as a means of engaging students.

Teachers’ reported competency across the practices also reflected low to medium
and medium to high ratings (range: 1.32–2.79). Teachers reported they were most com-
petent using the practice of actively supervising classroom activities (X = 2.79) which,
as just noted, was also the practice for which they reported being most knowledgeable.
Teachers’ self-reported competency ratings also reflected the smallest standard deviation
(s = .39), indicating ratings that were generally close to the mean. Teachers perceived
themselves to be least competent in using token economies (for instance, students earn
tokens that can later be redeemed for a prize or privilege) to acknowledge appropriate
behavior (X = 1.32), closely followed by the use of response cost, such as removing
reinforcers that a student has previously-earned, for responding to inappropriate student
behaviour (X = 1.33).

Table 1
Mean and Standard Deviations for Knowledge (K) and Competency (C) Ratings

<table>
<thead>
<tr>
<th>Concept (subscale)</th>
<th>Practices</th>
<th>K</th>
<th>K SD</th>
<th>C</th>
<th>C SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Maximising structure</td>
<td>a. Establish structure through teacher-directed activities</td>
<td>2.65</td>
<td>.66</td>
<td>2.70</td>
<td>.49</td>
</tr>
<tr>
<td></td>
<td>b. Physical arrangement that minimises distractions</td>
<td>2.39</td>
<td>.75</td>
<td>2.56</td>
<td>.64</td>
</tr>
<tr>
<td>2. Posting, teaching, reviewing, monitoring and reinforcing expectations</td>
<td>a. Develop and directly teach expectations</td>
<td>2.14</td>
<td>.93</td>
<td>2.22</td>
<td>.84</td>
</tr>
<tr>
<td></td>
<td>b. Actively supervise in all areas; provide feedback on expectations</td>
<td>2.82</td>
<td>.39</td>
<td>2.79</td>
<td>.47</td>
</tr>
</tbody>
</table>

Sequel to Table 1 see on p. 76.
Note. 0 = none; 1 = low; 2 = medium; 3 = high

Presented in Table 2 are the correlations between teachers’ reported knowledge and competency ratings for the evidence-based practices. Using Pearson’s correlation coefficient guidelines, all correlations are positive with moderate to strong coefficients (range: .34–.75) with the percent of variability accounted for by the linear relationship between knowledge and competency ratings ranging between 12% and 56%.

Table 2

Knowledge (K) and Competency (C) Rating Correlation Coefficients and R² Values

<table>
<thead>
<tr>
<th>Concept (subscale)</th>
<th>Practices</th>
<th>K &amp; C Correlation</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Maximising structure</td>
<td>a. Establish structure through teacher-directed activities</td>
<td>.56</td>
<td>.31</td>
</tr>
<tr>
<td></td>
<td>b. Physical arrangement that minimises distractions</td>
<td>.72</td>
<td>.52</td>
</tr>
<tr>
<td>2. Posting, teaching, reviewing, monitoring and reinforcing expectations</td>
<td>a. Develop and directly teach expectations</td>
<td>.75</td>
<td>.56</td>
</tr>
<tr>
<td></td>
<td>b. Actively supervise in all areas; provide feedback on expectations</td>
<td>.58</td>
<td>.34</td>
</tr>
<tr>
<td>3. Engaging students actively in observable ways</td>
<td>a. Opportunities to respond</td>
<td>.63</td>
<td>.40</td>
</tr>
<tr>
<td></td>
<td>b. Response cards</td>
<td>.71</td>
<td>.50</td>
</tr>
<tr>
<td></td>
<td>c. Direct instruction of skills</td>
<td>.49</td>
<td>.24</td>
</tr>
<tr>
<td></td>
<td>d. Computer-assisted instruction</td>
<td>.67</td>
<td>.45</td>
</tr>
</tbody>
</table>

Sequel to Table 2 see on p. 77.
Where Learning Evidence-based Classroom Management Practices Occurs

For teachers who reported having knowledge of each strategy, their self-reported history reveals in-service as the main source of learning for evidence-based classroom management practices (Table 3). More specifically, the mean percentage of learning across the practices ranged from 49.3 to 74.3 for in-service learning and from 18.4 to 41.6 for pre-service. For all items, pre-service learning was lower than in-service learning. In-service experiences contributed most to computer-assisted instruction as a means of actual engagement of students ($\bar{x} = 74.3$), whereas the mean percent of learning for that strategy via pre-service was 19.8. For practices that participants reported as being addressed through pre-service preparation, the greatest contribution was to teachers’ learning of direct skills instruction ($\bar{x} = 41.6\%$) and least to the use of response cards ($\bar{x} = 18.4\%$) to active engagement of students during instruction. The standard deviations of learning estimates from pre-service sources ranged from 15.57 to 26.99% and from 18.80 to 31.83% for in-service opportunities, which suggest highly variable experiences.

Table 3
Mean Learning Pre- and In-service Contributions for Each Evidence-Based Practice

<table>
<thead>
<tr>
<th>Concept (subscale)</th>
<th>Practices</th>
<th>Pre-service Mean % of Learning</th>
<th>Pre-SD</th>
<th>In-service Mean % of Learning</th>
<th>In-SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Maximising structure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Establish structure through teacher-directed activities</td>
<td>37.7</td>
<td>18.4</td>
<td>62.4</td>
<td>18.6</td>
<td></td>
</tr>
<tr>
<td>b. Physical arrangement that minimises distractions</td>
<td>25.1</td>
<td>18.0</td>
<td>67.6</td>
<td>24.9</td>
<td></td>
</tr>
<tr>
<td>2. Posting, teaching, reviewing, monitoring and reinforcing expectations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Develop and directly teach expectations</td>
<td>29.9</td>
<td>22.8</td>
<td>68.0</td>
<td>26.7</td>
<td></td>
</tr>
<tr>
<td>b. Actively supervise in all areas; provide feedback on expectations</td>
<td>33.3</td>
<td>16.8</td>
<td>65.9</td>
<td>20.7</td>
<td></td>
</tr>
</tbody>
</table>

Sequel to Table 2.

e. Class-wide peer tutoring .72 .52
f. Guided notes .70 .49
4. Using a continuum of strategies to acknowledge appropriate behavior
a. Behaviour-specific praise .34 .12
b. Class-wide contingencies .57 .32
c. Behavioural contracts .63 .40
d. Token economies .50 .25
5. Employing a variety of techniques to respond to inappropriate behaviour
a. Error correction for academic and social behavior .34 .12
b. Performance feedback .55 .30
c. Differential reinforcement techniques .57 .32
d. Planned ignoring .35 .12
e. Response cost .65 .42
f. Time out from reinforcement .56 .31

Sequel to Table 3 see on p. 78.
Sequel to Table 3.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Engaging students actively in observable ways</td>
<td>a. Opportunities to respond</td>
<td>30.7</td>
<td>17.7</td>
<td>67.1</td>
<td>27.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Response cards</td>
<td>18.4</td>
<td>15.6</td>
<td>59.6</td>
<td>31.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Direct instruction of skills</td>
<td>41.6</td>
<td>24.9</td>
<td>59.3</td>
<td>22.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. Computer-assisted instruction</td>
<td>19.8</td>
<td>16.0</td>
<td>74.3</td>
<td>27.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e. Class-wide peer tutoring</td>
<td>25.4</td>
<td>18.7</td>
<td>62.2</td>
<td>29.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>f. Guided notes</td>
<td>34.5</td>
<td>22.8</td>
<td>59.2</td>
<td>26.8</td>
<td></td>
</tr>
<tr>
<td>4. Using a continuum of strategies to acknowledge appropriate behaviour</td>
<td>a. Behaviour-specific praise</td>
<td>33.1</td>
<td>22.3</td>
<td>64.0</td>
<td>24.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Class-wide contingencies</td>
<td>20.1</td>
<td>18.0</td>
<td>55.5</td>
<td>27.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Behavioural contracts</td>
<td>29.5</td>
<td>24.3</td>
<td>65.3</td>
<td>27.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. Token economies</td>
<td>33.7</td>
<td>27.0</td>
<td>49.9</td>
<td>26.5</td>
<td></td>
</tr>
<tr>
<td>5. Employing a variety of techniques to respond to inappropriate behaviour</td>
<td>a. Error correction for academic and social behaviour</td>
<td>27.6</td>
<td>24.3</td>
<td>57.2</td>
<td>27.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Performance feedback</td>
<td>21.9</td>
<td>18.8</td>
<td>60.8</td>
<td>30.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Differential reinforcement techniques</td>
<td>27.2</td>
<td>21.5</td>
<td>59.7</td>
<td>29.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. Planned ignoring</td>
<td>24.7</td>
<td>21.7</td>
<td>62.3</td>
<td>25.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e. Response cost</td>
<td>24.0</td>
<td>22.8</td>
<td>49.2</td>
<td>25.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>f. Time out from reinforcement</td>
<td>25.4</td>
<td>20.1</td>
<td>59.6</td>
<td>26.3</td>
<td></td>
</tr>
</tbody>
</table>

The sources of teachers’ learning of the evidence-based classroom management practices were also examined more globally by subscale. As depicted in Figure 1, for each of the five subscales of evidence-based classroom management, teachers again estimated their learning as coming predominantly from in-service rather than from pre-service experiences. Teachers self-reported a mean of 65.8% of their learning to come from in-service of practices associated with establishing structure, a mean of 67.17% of learning related to teaching and reinforcing expectations, a mean of 64.36% for learning related to engaging of students, a mean of 58.93% for learning of acknowledging appropriate behaviour techniques and a mean of 58.34% for learning responding to inappropriate students’ behaviour.

![Figure 1. Means of teachers’ self-reported learning estimates for each subscale of evidence-based classroom management through pre- and in-service opportunities](image)
Pre-service experiences provide fewer opportunities to learn these evidence-based classroom management techniques by contributing an average of 30.27% of teachers’ learning of practices associated with structure, 31.37% for expectations, 28.37% for engagement of students, 29.51% for acknowledging appropriate behavior techniques and 25.17% for responding to inappropriate students’ behaviour prior to entering the field. Note that the sums of the mean percentages for pre- and in-service experiences do not total 100% as teachers with no knowledge of the practice or from the specific pre- or in-service source reported 0% learning, and such instances (outliers) influenced the mean. These results suggest that given the number and variety of skills associated with effective evidence-based classroom management, pre-service preparation in this area will undoubtedly need to be supplemented by in-service endeavours.

The Influence of PBIS on Teachers’ Knowledge and Competency

The mean self-reported knowledge and competency ratings by subscale for teachers working in a school that implements PBIS and for those who do not, are provided in Table 4. For each of the subscales, teachers who reported working in a PBIS school had descriptively higher means for both knowledge and competency ratings. An independent sample test of means indicated that the mean knowledge ratings of teachers in a PBIS school differed significantly from those not in PBIS schools only on the subscale area of post, teach, review, monitor and reinforce expectations (t = 2.76, df = 75, p < .05; ω² = .08). Further inspection of the mean ratings for each group suggested that this difference is mainly driven by the practice of actively supervise in all areas; provide feedback on expectations of the two practices that compose this subscale. The mean knowledge ratings for all other subscales between those who taught in a PBIS school and those who did not were not significantly different. For mean competency ratings, the mean for all subscales between those who taught in a PBIS school and those who did not were not significantly different.

Table 4
Means, Standard Deviations, Test of Means and Omega Squared Values for Teachers’ Knowledge (K) and Competency (C) Ratings for Each Subscale by PBIS School Status

<table>
<thead>
<tr>
<th>Concept (subscale)</th>
<th>K PBIS</th>
<th>K Non-PBIS</th>
<th>T-test</th>
<th>ω²</th>
<th>C PBIS</th>
<th>C Non-PBIS</th>
<th>T-test</th>
<th>ω²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Maximising structure</td>
<td>X = 2.60</td>
<td>X = 2.46</td>
<td>t = 1.02</td>
<td>.00</td>
<td>X = 2.70</td>
<td>X = 2.57</td>
<td>t = 1.26</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>s = .57</td>
<td>s = .59</td>
<td></td>
<td></td>
<td>s = .46</td>
<td>s = .44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Posting, teaching, reviewing, monitoring, and reinforcing expectations</td>
<td>X = 2.66</td>
<td>X = 2.33</td>
<td>t = 2.76*</td>
<td>.08</td>
<td>X = 2.59</td>
<td>X = 2.45</td>
<td>t = 1.11</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>s = .39</td>
<td>s = .62</td>
<td></td>
<td></td>
<td>s = .48</td>
<td>s = .56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Engaging students actively in observable ways</td>
<td>X = 2.19</td>
<td>X = 2.08</td>
<td>t = .85</td>
<td>.00</td>
<td>X = 2.08</td>
<td>X = 1.95</td>
<td>t = .88</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>s = .65</td>
<td>s = .49</td>
<td></td>
<td></td>
<td>s = .68</td>
<td>s = .61</td>
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Sequel to Table 4 see on p. 80.
Sequel to Table 4.

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<thead>
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<th>6</th>
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<tbody>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using a continuum of strategies to acknowledge appropriate behaviour</td>
<td>( \bar{X} = 2.26 )</td>
<td>( \bar{X} = 2.17 )</td>
<td>( t = .53 )</td>
<td>.01</td>
<td>( \bar{X} = 1.90 )</td>
<td>( \bar{X} = 1.84 )</td>
<td>( t = .310 )</td>
<td>.01</td>
<td></td>
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<tr>
<td></td>
<td>( s = .85 )</td>
<td>( s = .59 )</td>
<td></td>
<td></td>
<td>( s = .87 )</td>
<td>( s = .74 )</td>
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</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employing a variety of techniques to respond to inappropriate behaviour</td>
<td>( \bar{X} = 2.18 )</td>
<td>( \bar{X} = 1.94 )</td>
<td>( t = 1.63 )</td>
<td>.02</td>
<td>( \bar{X} = 1.83 )</td>
<td>( \bar{X} = 1.79 )</td>
<td>( t = .15 )</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>( s = .71 )</td>
<td>( s = .59 )</td>
<td></td>
<td></td>
<td>( s = .83 )</td>
<td>( s = .65 )</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

* \( p < .05 \).

The Role of Certification Status in Teachers’ Knowledge and Competency

As shown in Table 5, teachers with certification in special education reported higher mean ratings of knowledge and competency across all evidence-based classroom management subscales with statistically significant differences when compared to those who were not in three of the five subscales: Maximising structure \( (t = 2.29, df = 75, p < .05; \omega^2 = .05) \); Using a continuum of strategies to acknowledge appropriate behaviour \( (t = 2.83, df = 75, p < .05; \omega^2 = .08) \); Employing a variety of techniques to respond to inappropriate behaviour \( (t = 3.15, df = 75, p < .05; \omega^2 = .11) \). Examination of Omega squared strength of association, however, indicated that although very little shared variability in aggregate was accounted for by being certified in special education, the subscale Employing a variety of techniques to respond to inappropriate behaviour had more than 10% of the variability in knowledge of the practice accounted for by special education certification.

The competency ratings were significantly different for the same three of the five evidence-based classroom management subscales: Maximising structure \( (t = 3.55, df = 75, p < .05; \omega^2 = .15) \); Using a continuum of strategies to acknowledge appropriate behaviour \( (t = 4.09, df = 75, p < .05; \omega^2 = .21) \); Employing a variety of techniques to respond to inappropriate behaviour \( (t = 4.07, df = 75, p < .05; \omega^2 = .21) \). More striking differences were found when examining mean competency ratings for these subscales by those who are certified in special education and those who were not. In all areas for evidence-based classroom management, teachers certified in special education reported higher perceptions of competency. Furthermore, examination of Omega squared strength of association indicated that all three of these subscales have ratings for which more than 10% of the variability is accounted for by special education certification.
Teachers’ Facility with Evidence-Based Classroom Management Practices...

Table 5
Means, Standard Deviations and Test of Means for Teachers’ Knowledge (K) and Competency (C) Ratings for Each Subscale by Certification Status in Special Education

<table>
<thead>
<tr>
<th>Subscales</th>
<th>Knowledge Special Education Certified</th>
<th>Knowledge Special Education Not Certified</th>
<th>Competency Special Education Certified</th>
<th>Competency Special Education Not Certified</th>
<th>T-test</th>
<th>Omega Squared</th>
<th>Knowledge Special Education Certified</th>
<th>Knowledge Special Education Not Certified</th>
<th>Competency Special Education Certified</th>
<th>Competency Special Education Not Certified</th>
<th>T-test</th>
<th>Omega Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Maximising structure</td>
<td>X = 2.70</td>
<td>X = 2.41</td>
<td>X = 2.82</td>
<td>X = 2.51</td>
<td>t = 2.29*</td>
<td>.05</td>
<td>s = .47</td>
<td>s = .62</td>
<td>s = .25</td>
<td>s = .51</td>
<td>t = 3.55*</td>
<td>.15</td>
</tr>
<tr>
<td></td>
<td>s = .47</td>
<td>s = .62</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Posting, teaching, reviewing, monitoring and reinforcing expectations</td>
<td>X = 2.63</td>
<td>X = 2.38</td>
<td>X = 2.65</td>
<td>X = 2.43</td>
<td>t = 1.98</td>
<td>.04</td>
<td>s = .54</td>
<td>s = .54</td>
<td>s = .56</td>
<td>s = .49</td>
<td>t = 1.86</td>
<td>.03</td>
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<tr>
<td></td>
<td>s = .54</td>
<td>s = .54</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Engaging students actively in observable ways</td>
<td>X = 2.24</td>
<td>X = 2.05</td>
<td>X = 2.13</td>
<td>X = 1.94</td>
<td>t = 1.42</td>
<td>.01</td>
<td>s = .50</td>
<td>s = .59</td>
<td>s = .58</td>
<td>s = .67</td>
<td>t = 1.26</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>s = .50</td>
<td>s = .59</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Using a continuum of strategies to acknowledge appropriate behaviour</td>
<td>X = 2.48</td>
<td>X = 2.03</td>
<td>X = 2.29</td>
<td>X = 1.59</td>
<td>t = 2.82*</td>
<td>.08</td>
<td>s = .52</td>
<td>s = .77</td>
<td>s = .68</td>
<td>s = .75</td>
<td>t = 4.09*</td>
<td>.21</td>
</tr>
<tr>
<td></td>
<td>s = .52</td>
<td>s = .77</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Employing a variety of techniques to respond to inappropriate behaviour</td>
<td>X = 2.33</td>
<td>X = 1.87</td>
<td>X = 2.20</td>
<td>X = 1.56</td>
<td>t = 3.15*</td>
<td>.11</td>
<td>s = .50</td>
<td>s = .68</td>
<td>s = .60</td>
<td>s = .71</td>
<td>t = 4.07*</td>
<td>.21</td>
</tr>
<tr>
<td></td>
<td>s = .50</td>
<td>s = .68</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

* p < .05.

Discussion

This study investigated teachers’ self-reported knowledge of and competency in using evidence-based practices in classroom management. In addition, the role of pre-service and/or in-service experiences was explored. Notable findings of this study include significant relationships between teachers’ ratings of knowledge and competency with specific evidence-based classroom management practices. Teachers who reported working in a school that implements PBIS and those with certification in special education had descriptively higher mean knowledge and competency ratings when compared to those without such statuses. Finally, for all subscales and practices, teachers reported most of their learning of evidence-based classroom management skills coming from in-service experiences.

The Relationship Between Knowledge and Competency Ratings

The moderate to strong positive direct correlations between perceived knowledge of and competency in evidence-based classroom management indicate that, in general, as teachers’ perceived knowledge of a practice increases, perceived competency in using the strategy also increases. Teachers perceive themselves to be most competent in skills related to structure and expectations. This finding is consistent with what Shook (2012) found in her investigation about proactive and reactive classroom management practices.
used by teachers as confirmed by direct observations. The strong relationship between knowledge and competence, however, does not mean these teacher attributes are interchangeable. That is, self-reported knowledge of a strategy does not necessarily translate into perceived competency using the strategy, nor does perceived competency indicate that the teacher has knowledge of the practice. In four of the five subscales, for instance, teachers rated their knowledge of evidence-based classroom management practices higher than their competency. This finding is consistent with that of Begeny and Martens (2006) who asserted that knowing a practice does not equate to its confident and accurate use.

Learning Evidence-Based Classroom Management Practices

Teachers reported that the majority of their learning about all of the evidence-based classroom management practices comes from in-service sources as opposed to pre-service experiences. These results are consistent with the work of other researchers (Merrett & Wheldall, 1993; Smart & Igo, 2010) who reported that pre-service preparation programmes are not primary sources of teachers’ classroom management capacity. Teacher’s limited knowledge about the five critical elements of evidence-based classroom management practices coming from pre-service sources was related to the findings of the National Council on Teacher Quality (2014) that found almost 80% of teacher preparation programmes addressed two of the five subscales.

PBIS School Status

As mentioned previously, effective classroom management practices as determined by are essential components of the universal level of supports provided within the PBIS framework. The evidence-based practices determined by Simonsen and her colleagues (2008) offer teachers an insight as to practices that have shown positive effects in real classrooms in multiple research investigations. At the subscale level, teachers who worked in a PBIS school reported statistically significantly higher knowledge ratings for the posting, teaching, reviewing, monitoring and reinforcing expectations subscale when compared to respondents who do not identify an affiliation with a PBIS school. The difference is logical given the PD in classroom management provided to teachers as part of the PBIS framework. It is also feasible that teachers who work in PBIS schools experience a prominent emphasis on classroom management. This finding also relates to the work of Ross, Romer and Horner (2012), who found that randomly-selected elementary school that worked in schools that implement PBIS with fidelity self-reported increased efficacy as well as usage of evidence-based classroom management practices, such as teaching expectations and providing reinforcement, when compared to those who did not teach in such a school.

Certification Status in Special Education

Both knowledge and competency ratings of teachers who were certified in special education were statistically significantly higher than those who were not for the same three of the five areas (Maximising structure; Using a continuum of strategies to acknowledge appropriate behaviour; Employing a variety of techniques to respond to inappropriate behaviour). Noteworthy findings include certification status in special education
accounted for approximately 11% of the variance in knowledge ratings for employing a variety of techniques to respond to inappropriate behaviour. For teachers’ competency ratings, being certified in special education accounted for approximately 15% of the variability for maximising structure and 21% for the using a continuum of strategies to acknowledge appropriate behaviour and employing a variety of techniques to respond to inappropriate behaviour subscales. These trends lend support for the assertion that special educators often receive more preparation in the area of classroom management than their general education counterparts (Oliver & Reschly, 2010; Tillery et al., 2010), which may influence special educators’ ratings of knowledge and competency with evidence-based strategies in this domain due to perceived preparedness. However, given the inclusive nature of today’s classrooms, it is imperative that general educators also receive instruction in their preparation programmes that emphasise effective evidence-based classroom management techniques.

Conclusions and Future Directions

This study supplements extant literature in two very important ways. First, teachers’ self-reported knowledge and competency related to specific evidence-based classroom management subscales were addressed. Second, the learning sources for these particular strategies were identified so as to understand at what point in their career teachers come to learn such skills. One limitation of the current study that must be considered is its reliance on self-report data, which inherently risks biased or inaccurate recall, as well as over-estimation of preparedness and confidence (Housego, 1990) given no observation data (Reupert & Woodcock, 2010). One must also consider the possible recency effects in estimating when the skills were learned, as well as unknown levels of implementation fidelity for those who reported working in a PBIS school. The limited response rate and the specificity of the respondents from New York’s public schools must also be factored in when generalising the study’s findings to other teacher populations or schools that define grade bands differently than presented in the current study. Future investigations should explore specific grade band correlations between teachers’ knowledge of and competency with evidence-based classroom management practices now that the general trend has been ascertained in this study.

Despite these limitations, the results of this study have important implications for both research and practice. Teachers’ self-reported knowledge of, competency with, and actual application of evidence-based classroom management practices appear to be related to certification area and service environment. Although respondents were not asked to identify their teacher preparation source or institution in order to maintain anonymity and comfort taking the survey, the results suggest that teachers develop skills in the area of classroom management via both pre-service and in-service sources, with the latter source being more prominent according to self-report. Therefore, it is imperative that teacher preparation programmes provide coordinated coursework and fieldwork experiences through which teachers can be prepared in evidence-based classroom management skills and provided with a foundation to access future opportunities to apply and enhance skills in this important domain via in-service sources. With such comprehensive opportunities, teachers may deem themselves equipped with effective strategies to support students’ academic and social outcomes that so heavily depend on teachers’ knowledge and competency.
References


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Appendix A

Evidence-based Classroom Management Skills Compiled by Simonsen et al. (2008)

<table>
<thead>
<tr>
<th>Critical Elements (Concept/Subscale)</th>
<th>Practices</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1. Maximising structure</td>
<td>a. Establish structure through teacher-directed activities</td>
<td>A teacher’s involvement and defining of routines</td>
</tr>
<tr>
<td></td>
<td>b. Physically arrange the classroom to minimise distractions</td>
<td>A teacher is about the purposeful layout of furniture and visuals to minimise crowding and distraction</td>
</tr>
<tr>
<td>2. Posting, teaching, reviewing, monitoring and reinforcing expectations</td>
<td>a. Develop and directly teach expectations</td>
<td>3–5 positively-stated expectations are visually posted, directly taught to students (and reviewed) via lessons, examples and non-examples</td>
</tr>
<tr>
<td></td>
<td>b. Actively supervise in all areas; provide feedback on expectations</td>
<td>A teacher monitors, moves and looks around, interacts with students, provides error correction or reinforcement for behaviour based on expectations</td>
</tr>
<tr>
<td>3. Engaging students actively in observable ways</td>
<td>a. Provide opportunities to respond</td>
<td>A teacher prompts students in a way that requires their response/engagement</td>
</tr>
<tr>
<td></td>
<td>b. Use response cards</td>
<td>Response system for all students used to answer a teacher’s question</td>
</tr>
<tr>
<td></td>
<td>c. Directly instruct skills</td>
<td>A teacher’s presentations academic and social skills content explicitly and systematically</td>
</tr>
<tr>
<td></td>
<td>d. Use computer-assisted instruction</td>
<td>A teacher uses technology to individualise instruction or have students practice skills</td>
</tr>
<tr>
<td></td>
<td>e. Use class-wide peer tutoring</td>
<td>Students are paired as tutoring partners for rapid skill practice receiving immediate error correction</td>
</tr>
<tr>
<td></td>
<td>f. Use guided notes</td>
<td>Outlines of notes on which students need to fill in missing information</td>
</tr>
</tbody>
</table>

Sequel to Appendix A see on p. 87.
Sequel to Appendix A.

4. Using a continuum of strategies to acknowledge appropriate behaviour
   a. Provide behaviour-specific praise
   A teacher verbalises a reinforcing statement to students about their appropriate behaviour
   b. Offer class-wide contingencies
   Groups of students can earn a reward for meeting a common goal
   c. Develop behavioural contracts
   Written document developed for behaviour and consequences (the outcome of appropriate behaviour and vice versa)
   d. Develop token economies
   Earned tokens to be redeemed for a prize or privilege

5. Employing a variety of techniques to respond to inappropriate behaviour
   a. Use error correction for academic and social behaviour
   Brief statement summarising an inappropriate behaviour and what the student should do instead
   b. Give performance feedback
   Class-wide data are used to set goals with students for which they can earn rewards
   c. Provide differential reinforcement
   Appropriate behaviour is reinforced to decrease the inappropriate behaviour
   d. Practise planned ignoring
   A teacher purposefully withholds attention as a consequence when attention motivates inappropriate behaviour
   e. Use of response cost
   A student loses tokens or privileges when an inappropriate behaviour is displayed
   f. Provide time out from reinforcement
   A student is away from reinforcing people, locations and/or objects

Appendix B

<table>
<thead>
<tr>
<th>Scale</th>
<th>Critical Element/Subscale</th>
<th>Cronbach’s Alpha Coefficient</th>
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<td>Knowledge</td>
<td>Overall</td>
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<td></td>
<td>Maximising structure</td>
<td>.554</td>
</tr>
<tr>
<td></td>
<td>Posting, teaching, reviewing, monitoring and reinforcing expectations</td>
<td>.345</td>
</tr>
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<td></td>
<td>Engaging students actively in observable ways</td>
<td>.772</td>
</tr>
<tr>
<td></td>
<td>Using a continuum of strategies to acknowledge appropriate behaviour</td>
<td>.790</td>
</tr>
<tr>
<td></td>
<td>Employing a variety of techniques to respond to inappropriate behaviour</td>
<td>.803</td>
</tr>
<tr>
<td>Competency</td>
<td>Overall</td>
<td>.859</td>
</tr>
<tr>
<td></td>
<td>Maximising structure</td>
<td>.384</td>
</tr>
<tr>
<td></td>
<td>Posting, teaching, reviewing, monitoring, and reinforcing expectations</td>
<td>.317</td>
</tr>
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<td></td>
<td>Engaging students actively in observable ways</td>
<td>.781</td>
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<td></td>
<td>Using a continuum of strategies to acknowledge appropriate behaviour</td>
<td>.764</td>
</tr>
<tr>
<td></td>
<td>Employing a variety of techniques to respond to inappropriate behaviour</td>
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Envisioning the Future: Bachelor’s and Master’s Degree Students’ Perspectives

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Abstract

Education is a future-facing activity. Therefore, universities need to engage students in building alternative and preferable future scenarios and reveal features of unsustainability, as well as open spaces for students to participate in discussions and negotiate new meanings. This paper reveals the future visions bachelor’s and master’s degree students from one of the regional universities in eastern Latvia have of education and focuses on a sustainability analysis (sustainable and unsustainable) of societal aspects and education. The authors conclude that thinking about preferred futures make students more aware of the positive changes that could be made and their personal responsibility to contribute to these changes. In this connection, the need to take a broad, integrated and holistic view of the future and its social and personal significance is of utmost importance.

Key words: preferable futures, feared futures, features of unsustainability, features of sustainability, higher education

Sustainability Framework Envisioned

In 2002, world leaders reaffirmed the principles of sustainable development at the World Summit on Sustainable Development in Johannesburg, emphasising the role that education plays in defining future orientations. As stated in the United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Conference for Sustainable Development “Learning Today for a Sustainable Future” that took place in 2014 in Nagoya, Japan, educators are called upon to promote attitudes and behaviour congruent to a culture of sustainability. This puts an imperative to enhance the agency of each and every educator to use sustainable pedagogical approaches to empower youth to assume responsibility for creating a sustainable future. Iliško (2007) also emphasises the need for teachers to become active agents themselves in the process of “cultural reconstructions and educational re-conceptualization” (p. 17).

Structural, political, economic and systemic changes in Latvia promote new ways how to view knowledge, foster new ways of interacting with people via information technologies and bring about a new meaning of the conceptualisation of the word “world”. Ratcliff (2004) argues that serious rethinking, accompanied by a more holistic
view of a reform processes in education is essential. This, of course, needs to be followed by “further modification and fine-tuning” to generate “a discourse leading to new changes previously not envisioned” (Ratcliff, 2004, p. 108). Young people need a ‘new framework’ to meet their potential as future-oriented human beings (Wheeler & Bijur, 2000). The question is how universities are preparing students to create a more just, humane and sustainable world. Fien (2002) argues that a vision of sustainable schools encompasses a vision that is not only ecologically, but also socially, economically and politically sustainable. This new framework of the future school and society, as a whole, needs to be based on local community contexts. Fien (2002) emphasises that a vision of a sustainable society and schools needs a holistic approach and an educational rethinking that involves a practice-based interdisciplinary curricula, problem-solving strategies, the integration of sustainability principles throughout the curriculum and attention to both local and global contexts.

A Framework for a Sustainable School

This becomes more evident when schools and universities are among the slowest and most difficult institutions in which to implement sustainability agenda. Universities play a major role in training teachers to work in future schools. The perspectives related to sustainability require re-evaluating the whole idea of the schools, teaching and practices inherited from the past (Sterling, 2005).

This requires innovations and organisational change rather than just integrating the concept of sustainability into already existing curriculum. UNESCO is the leading agency to define the United Nations (UN) Decade of Education for Sustainable Development (DESD) (2005–2014) that emphasises integrating values and practices of sustainable development at all stages of education in order to address the social, economic, cultural and environmental problems of this century. Future schools need to equip students with necessary skills and competencies to live in an increasingly globalised world and to understand the unique contribution each of them can offer. Schools and universities need to find a way for the four pillars: Learning to know; Learning to do; Learning to live together; Learning to be can find their equal place in education. Young people who enter the labour market in the upcoming decades will play a significant role in facilitating sustainable development to better meet future challenges.

Consequently, schools need to equip learners with the skills and values needed to cope with present and future demands. UNESCO (2009) defines education for sustainable development (ESD) as a complex notion combining knowledge, competencies, skills, values and behaviours. Schools need to help to equip students with greater humility, respect for the all forms of life and future generations, the capacity to think systematically, challenge unethical decisions and increase awareness, knowledge and the necessary tools to create a sustainable future. Davies, Devin and Mariana (2011) argue that students need a completely different set of skills to be able to adjust to evolving requirements. Some of these requirements include transdisciplinarily, new literacies and adaptability. Dede (2010) adds such skills as critical thinking, creativity, innovation skills, collaboration skills, contextual learning skills, self-direction and communication skills, all of which should be fully integrated throughout the curriculum. Teaching such life skills should be done through discovery-oriented teaching methods, team work and active participation of students in curriculum planning (Jiminez, 2006).
According to UNESCO (2005) definition, “The overall goal of DESD is to integrate the values inherent in sustainable development into all aspects of learning, to encourage changes in behaviour that allow for a more sustainable and just society for all” (p. 6). This definition places emphasis on the dimension of practice dimension; in other words, how the concept is practiced, its impact on students’ behaviour and how to live in a more sustainable manner. Education helps students to understand the world in which they live by addressing the complexity and interconnectedness of problems (UNESCO, 2002). Education is a “future-facing activity” (Facer & Sandford, 2010, p. 74). Therefore, universities need to engage students in building alternative and preferable future scenarios and to reveal features of unsustainability, as well as open spaces for students to participate in discussions and negotiate new meanings (Hedley, 2001; Sterling, 2002). As stated in the renewed version of the European Strategy for Sustainable Development (European Council [EC], 2006), the success of revealing and “reversing unsustainable trends to a large extent depends on a high-quality education for sustainable development at all levels of education” (p. 22).

This also requires flexibility within the different academic disciplines. Reforms aimed at sustainability in higher education foresee the students to be more actively involved in individual and collective activities. This, in turn, requires university teachers to adopt new roles, as well as a more holistic and systematic way of thinking (Ilisko, 2005; Iliško, Ignatjeva, & Mičule, 2011; Salite, 2008; UNESCO, 1997).

**Students’ Beliefs about the Future**

Setting goals for the future and exploring possible future scenarios is natural for every human being. As persons mature, they formulate more specific and more conscious future plans that motivate their everyday actions. Every student possesses his/her specific set of beliefs. Beliefs provide people with a framework of how to interpret the world and act, determine which priorities to choose. Students constantly refine and change their beliefs as a result of the influence of significant others or important events in their lives. Education needs to develop students’ capacity to believe that their beliefs influence their daily choices and actions. Future orientations refer to the images persons have about themselves, their personal individual future as reflected in their goals, plans and strategies.

Universities need to prepare students to play a significant role in society. Each student lives within the interconnected framework of political, cultural, economic and ecological dimensions that influence them in significant ways. Each student is imbedded (located) within a particular culture with its specific heroes, series and meanings. The meaning each person makes is both deeply collective and personal. Therefore, each student creates his/her personal future vision and his/her personal meaning. Students choose metaphors about the issues that are significant for them and select those which make more sense to them. Students develop a moral vision of a social order of the educational system and a future society by expressing moral sensitivities about their detachment from a natural world, the urge to live a healthier and a more sustainable life in all its dimensions, leading to the congruence of personal and global well-being.

Education is a future-oriented activity. This involves deciding what to study, what is important to learn and what will be necessary for the students in the labour market after their graduation. Unfortunately, the possibility of alternative futures remains largely
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unarticulated at universities. In line with Facer and Sandford (2010), Inayatullah (2008) and UNESCO (1997), this is essential to engage educators and students in the process of envisioning the future for developing more nuanced and alternative trajectories of possible and preferable future scenarios with defining responsibilities and consequences of one’s personal actions. The set of tools and suggestions designed by Eckersley (2002), Fien (2002) and Hick (1995, 1998) for teachers and teachers’ educators need to be taken into serious consideration by engaging students in envisioning the future since education in the broadest sense plays a pivotal role in bringing about more profound changes, in both tangible and intangible ways (UNESCO, 1997). Facer (2009) and Scott and Gough (2003) argues that educators need to be aware that there will be no single educational response to how to prepare learners for potential future developments. Therefore, educators need to prepare a template of “a school of a future” which might inspire students and bring about “a commitment to creating a diverse ecology of educational institutions and practices” (Facer, 2009, p. 8).

Methodology of the Study

For the purpose of this study, the authors carried out 1–1,5 hour-long life story interviews with eight bachelor’s and eight master’s degree students about how they envision possible and probable future scenarios. The students are representative of the different faculties – “The Faculty of Natural Sciences and Mathematics”, “The Faculty of Humanities”, “The Faculty of Education and Management”, “The Faculty of Music and Arts”, “The Faculty of Social Sciences”. Two students from each area voluntarily agreed to participate in this study. Instead of closed questions, we opted for open-ended life story interviews which lent themselves to thorough and detailed discussion. This method offered the researchers greater flexibility to explore more areas in depth by generating further questions during the conversations, followed by the four focus group interviews (n = 65). The students who participated in the focus group interviews comprised a sample representing students who were matriculated in the master’s degree programme “Education”. The sample of bachelor’s degree students was composed of the students who were enrolled in the bachelor’s degree programme “Education” and consisted of preschool and primary school teachers.

Students’ stories revealed their meanings about the world that were particularly significant for them. Students revealed from where they generated their life purposes and aspirations. The limitations of this perspective were accepted as part of the research. Questions and themes were similar in all the interviews, but the interviews enabled the authors to explore the themes that arose in a more nuanced manner. The interview transcripts provided diverse meanings in which interviewees described certain phenomena. The analysis of all the interviews was carried out, and a number of themes with regard to a preferable future were singled out. Quotes from the interviews were used to illustrate the essence of the category. A number of variations (descriptors) were singled for each category. Life story interviews with the bachelor’s and master’s degree students allowed initial categories or descriptions to emerge. A phenomenological approach allowed the researchers to capture diverse ways the students describe future scenarios. These variations were grouped in descriptive categories that reflect the essence of various phenomena.
All the students possessed a coherent set of beliefs that described their lives and future plans. The students were encouraged to think about the possible and preferable future and discuss the actions that schools and each of them could carry out to bring about their vision. They were asked about the main constraints and obstacles faced in attempting to reach a sustainability vision. The authors used questions that helped them to uncover students’ worldviews: How do you envision a future society? What is a good future perspective for you? What are the features of sustainability and unsustainability in your future scenarios? What are your visions of a future school? By doing this, students learned how they come to believe what they believe and how those beliefs are present in their daily lives. Students were, then, asked to consider what is possible and desirable, and they were encouraged to discuss the factors that they considered to be significant determinants in reaching their future visions.

Research Findings

The future visions of students are framed by their system of beliefs. Students selected the factors that affected their future visions; they traced lines among the different factors, and how they intertwine and influence each other. Students were encouraged to reflect on their worldviews in the individual interviews. The worldviews of students are different from the ones that the teachers and their parents hold. Most of their stories are shaped by the media and somewhat less by books. As the interview data reveals, the future visions and ambitions of students have more to do with economic well-being than the common good or justice.

The envisioned ‘preferable future’ scenarios of the students helped them to discover new relationships and possibilities in the moral and social domains. The development of constructive and systematic beliefs and the acceptance of social responsibility for a sustainable future was a contributing factor in this particular study. A vision of the future can be seen as a powerful device that can promote change in the present and empower students to make decisions about a possible future. As it is stated by UNESCO (1997), all practices that are not sustainable should be identified. Possibilities for correcting them can then be discussed and explored by the students. It is critically important that the entire community be involved in the discussion.

Creative envisioning also stimulated students’ moral reasoning, allowing them to move beyond conventional levels of thought and helping alternative relations among the concepts to emerge that were congruent with higher levels of moral reasoning. This exercise in imagination allowed the students to immerse themselves in multiple contexts and to respond to the situation as a whole person.

This research highlights the most frequently mentioned hopes and constraints for implementing future visions of a sustainable society and a school as viewed by bachelor’s and master’s degree students, which are related to political, economic, social, ecological, cultural and environmental dimensions.

Among the most frequently mentioned constraints with regard to the future, the bachelor’s and master’s degree students mentioned the following aspects: economic (fear of unemployment; poverty; competitiveness in the labour market), political (lack of strong leadership; lack of agency and engagement in decision-making processes concerning future planning of local and global futures; overwhelming bureaucracy; school leaders’ limited autonomy; leaders’ fear to initiate sustainable changes in school and
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society; the culture of civic passivity; alienation and lack of voice), social (gap between the rich and the poor; exclusion-oriented culture; segregation), culture (growth of a consumer culture), ecological (ecological devastation; health issues; unsustainable livelihood and materialism).

Among the ‘feared future’ dimensions mentioned in life story interviews was a political dimension (lack of agency and engagement in the decision-making process concerning future planning of local and global futures; the need for stronger leadership; reducing bureaucracy; increasing autonomy of school leaders; the courage to initiate changes in school; the present culture of civic passivity; alienation and silence; the need for stronger leadership). Some extracts from student essays illustrate their worries and future hopes.

A Need of Wise Leadership in Building a Future Society

There are no real and charismatic leaders that can find the solution in the spheres of life. Today leaders need new competencies and a capacity in bringing a vision of a sustainable society a reality. They need to fight less among themselves over a domineering position in politics but rather to work cooperatively over implementing a sustainability agenda.

Students emphasised the need of new qualities of school and societal leaders to think systemically and to challenge unethical decisions and actions. Despite of predominantly self-centred and career-oriented future goals, some students expressed their willingness to contribute to the political well-being of the country.

I want to become the head of the school. I don’t want just to occupy the position but to support young people and to encourage them to do their best for a well-being of the town, the school and the country. I want to be a contemporary leader who is up to date and who serves other people.

Among the descriptors of economic dimensions, the following can be named: poor living conditions, unavailability of jobs and high competitiveness in the labour market. In life-story interviews, the majority of students placed emphasis on prosperity and economic well-being, with their narrow aim oriented towards self-fulfilment, self-indulgence and the realisation of the American dream.

Self-centred, Egoistic Future Perspectives

I try to visualise my future. I have a poster of my possible future in front of me in my room which captures my dream of having a nice home, an Audi car, preferably white.

Another student stated, “I want to enjoy my life. I want to do the things I like. I want to get a well-paid job, to travel and to enjoy my life. I want to enjoy my life to a full extent and to enjoy the fruits of my success.”

Despite the economic difficulties in the country, some students hold a positive future perspective.
Learning the Skills for Life in the 21st Century

I want to find my place in this life where I can succeed. I am optimistic, positive and always in motion. I want to stay in my country and to realise my potential. I know it will take time and lot of efforts to reach something.

The unemployment issue was well pronounced in all the interviews, the consequence of which is the brain drain. Despite this, the students expressed their hopes to start small businesses and their belief in the power of entrepreneurship. They linked those themes with the economic and political processes in the country.

Bridging the Gap of a School and a Local Community

The majority of students expressed their concern that what they are learning at schools is not compatible with the requirements in the labour market outside the formal education. They expressed hopes that future schools will develop skills and competencies in areas required for the next stage of their lives, like more intensive integration of information and communication technology (ICT), teamwork and other life skills.

The other factor that was singled out in students’ responses was an ecological dimension revealed as a misuse of natural resources, overconsumption, unsustainable relations and unsustainable environment: fragmented, discipline and result-oriented learning environment at school. Some students pointed to their contribution to the ecological sustainability of the earth.

Care for Future Generations

In some interviews one can trace intergenerational connectedness and a care for their future.

I want the world to be a more beautiful place for future generations as well. I enjoy spending my time in nature, I enjoy its beauty. I want this to be available for my children as well. ... I have a feeling that people live without any concern about the future. They live as if tomorrow never comes. They are simply enjoying the present day.

Care of the surrounding environment. Environmental motives were the most pronounced aspects in the students’ essays. One of the students said, “I try to live in a harmony with nature. I am trying to give a second life to some of my used things. I do not throw those things out. I use eco-friendly washing liquids.”

Another student responded, “It is quite painful to see a deserted countryside. Young people are leaving the country for better jobs or leave for big cities. Still, I can mention some good examples. I see how people try to cultivate their land. They grow their own vegetables. I do not think if a return to an agrarian society is the best solution, but rootedness in one’s land may be a solution for us.”
Concern about the ecological problems. Almost all students have raised the issue of human beings causing harm to nature and the surrounding world. Among all the dimensions of sustainability, the other most pronounced was a social dimension (competitiveness; alienation in all levels; marginalisation; exclusion; undemocratic power structures; intolerant attitude; life in a multicultural society).

In both interviews and focus group interviews, students pointed to the issue of exclusion of some groups of people from the societal and political processes in the country.

Exclusion of Some Groups from the Societal and Political Processes and Depriving Them a Voice

... some groups of people are excluded from societal processes, like people with special needs, retired people or unemployed people. They live almost under the poverty line. There are almost no guarantees or hopes for them. They are simply locked in their apartments.

The students expressed their hopes in government initiatives to involve marginalised groups of people in societal decision-making processes. One of the interviewed students pointed to a school and university graduates as a vulnerable group of society.

... the graduates of universities are facing a most painful situation. They are energetic and enthusiastic to implement their newly acquired knowledge but there is no availability of job placements and they are forced to leave the country. The government has invested in them for the future development of the country, but they are forced to make a decision to leave the country.

The most positive aspects mentioned in students’ essays were related to a culture dimension. The students mentioned features of a sustainable future, such as strong cultural traditions, rootedness in cultural wisdom and reality of a newly emerging multicultural society. As one of the bachelor’s degree students commented, “A good thing to tell is about our cultural heritage and traditions that have survived throughout the centuries and that keep our culture alive and resilient to any changes.”

The students pointed also to some unsustainable aspects that need to be considered in the envisioned future perspectives. Two of the most often mentioned included a predominantly materialistic culture and the need for more humane relationships.

I hope people will not focus too much on materialistic aspects. They need to become more human, they need to turn to spiritual values.

In my envisioned future, I want people to be more humane and to build much healthier relations among themselves. ... I want them not to live in hatred, but in solidarity and a mutually supportive atmosphere.

Table 1 summarises aspects of unsustainability gained in the envisioned future orientation of bachelor’s and master’s degree students in their life story interviews.
### Table 1

*Content Analyses of Unsustainability Aspects in Society as Obstacles in a Feared Future – Orientations of Bachelor’s and Master’s Degree Students*

<table>
<thead>
<tr>
<th>Unsustainability Dimensions</th>
<th>Content Categories (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Political</strong></td>
<td>Lack of agency and disengagement of people in decision-making processes concerning future planning of local and global futures (10); lack of strong leaders (9); overwhelming bureaucracy (6); limited autonomy of schools’ leaders (5); fear of initiating changes in school and society (8); the culture of civic passivity (7); alienation (6)</td>
</tr>
<tr>
<td><strong>Economic</strong></td>
<td>Poor living conditions of the majority of population (14); unavailability of jobs in the labour market (9); unemployment (8); poverty (9); immigration; demographic situation (9)</td>
</tr>
<tr>
<td><strong>Ecological</strong></td>
<td>Unsustainable relationships (13); unsustainable environment: fragmented, discipline and result-oriented school environment; (5) ecological devastation (8); health issues (10); consumerist lifestyle (7); modified foods (7); health problems caused by environmental damage (6); disinterest in global issues (4)</td>
</tr>
<tr>
<td><strong>Culture</strong></td>
<td>Growth of a consumer culture (7); culture of ignorance (6); disbelief in the future (9); lack of skills to live in a multicultural society (8); intolerance to other ways of life and traditions; xenophobic sentiments towards other cultures</td>
</tr>
<tr>
<td><strong>Social</strong></td>
<td>Competiveness (10); marginalisation of some groups of society (9); gap between the rich and the poor (7); exclusion-oriented culture (9); segregation (6); aggression, violence among people (9)</td>
</tr>
</tbody>
</table>

‘Proactive Futures’ – Responsibilities Reflected in the Future Visions of Students

The ‘preferred future’ perspectives reflect a scope of responsibilities towards the planet Earth. Students’ preferred future models are rooted in a global and ecological perspective with all the dimensions involved (ecological: sustainable lifestyle; care for the surrounding environment; comprehension of interconnectedness; social: respect for diversity of human experience; economic: inclusion of disadvantaged and marginal groups; political: agency; awareness of responsibilities; participatory democracy; freedom of choice; global responsibility; cultural: respect and ecological sensitivity to the diversity of cultures and worldviews).

In the focus group discussions, it was evident that the present state of the Earth’s development is unsustainable. Students located their future visions within the interconnected network of political, intellectual, social and international frameworks that put certain demands on their lives.

The most frequently mentioned aspects of unsustainable education as mentioned by the students are given in Table 2.
### Table 2
**Facets of Unsustainability of Current School Practice Prospectus**

<table>
<thead>
<tr>
<th>Category</th>
<th>Facets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecological</td>
<td>Careless attitude to nature; cruelty; overemphasis on indoor learning; consumerist attitude; health issues of students caused by the unhealthy consumption of junk food; environmental pollution; lack of resources</td>
</tr>
<tr>
<td>Socio-political</td>
<td>Disrespect to other people; mobbing; competition; class division; alienation; marginalisation of some groups of students; exclusivist and xenophobic attitudes towards the ‘other’; alienation among the people caused by the overdependence on technologies; overemphasis on the cognitive dimension in school curriculum rather than on value education and spirituality; fragmentation</td>
</tr>
<tr>
<td>Political</td>
<td>Lack of agency of teachers and students in decision-making processes; undemocratic decision-making processes; bureaucracy; centralised structures; political tensions</td>
</tr>
<tr>
<td>Economic</td>
<td>Overconsumption; dominant consumerist value orientation; low prestige of the teaching profession; unmotivated teachers in introducing changes; low teachers’ salaries; outdated technologies at schools; lack of resources; a dangerous demographic situation; low quality education; students’ emigration; unemployment of graduates; lack of skills of school graduates to enter in the labour market; globalisation</td>
</tr>
<tr>
<td>Socio-cultural</td>
<td>Lack of skills to live in a multicultural environment; intolerant attitude towards other cultures, languages, ways of living and thinking; intolerance; xenophobic attitudes; racism; class society; brain drain; emigration to economically prosperous countries</td>
</tr>
</tbody>
</table>

The ‘preferred future’ scenarios of the bachelor’s degree students are quite optimistic, in a way a little bit naïve, as compared with master’s degree students, whose visions are more pronounced and well-grounded in the current reality.

### Table 3
**Facets of Sustainability of the ‘Preferred Future’ School Scenarios**

<table>
<thead>
<tr>
<th>Category</th>
<th>Facets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecological</td>
<td>Teaching care for the planet; sustainable life styles; care for the surrounding environment; awareness of the interconnectedness; healthy food; safe environment; recycling; growing concern about the ecological issues</td>
</tr>
<tr>
<td>Social</td>
<td>Safe physical and psychological environment; cooperation; kindness; recognition of the needs of each student; values education; community-oriented outreach; spiritual values; ICT as a tool for global interconnectedness</td>
</tr>
<tr>
<td>Political</td>
<td>Mutual decision-making processes; agency; awareness of individual responsibilities; participatory democracy as the best form of leadership and governance; freedom of choice; awareness of a global responsibility; sustainable thinking; expanding the boarders of school community to a local community; community outreach</td>
</tr>
<tr>
<td>Economic</td>
<td>Competition in the labour market, which might raise teachers’ competencies and qualifications; engagement of schools in sustainability projects; support for children from disadvantaged and dysfunctional families; investments in education; integration of technologies as a tool for quality education</td>
</tr>
<tr>
<td>Culture</td>
<td>Respect and care for other cultures and languages; overcoming xenophobic attitudes; language acquisition; learning tolerant attitude; widening the labour market; competitiveness; more opportunities for academic mobility; the use of ICT as a means to learn about other cultures</td>
</tr>
</tbody>
</table>

*Sequel to Table 3 see on p. 98.*
Students’ dreams about the future school included the need for greater flexibility in otherwise rigid and standardised school structures, the integration of ICT, more interconnectedness, less formality, more looseness, as well as the need of wise leaders with the system thinking and a sustainability vision.

Students’ envisioning their future helps them to create a picture from their imagination in their minds of what they want to bring into existence. The future school is imagined by the students as resilient, non-hierarchical and driven by sustainable leaders.

The more pronounced aspects of the future school scenarios include modern and contemporary infrastructure, equipped with the latest technologies: My future school has a huge and modern gym. All classrooms are equipped with modern lighting and comfortable furniture, sliding boards and audio-visual equipment. Some ideas represented are quite futuristic: We shall study geography virtually, each child will have his/her own computer. In 50 years, children will come to school by spaceships and airplanes.

The more pronounced aspects of the future school scenarios also include a child-centred school with a democratic decision-making governance: Children will be able to express their opinions, to make mistakes without being punished for them. If they make a mistake, teachers will correct them pedagogically. One student noted, “Children will feel that they are a part of school.” Another student commented, “The future school is a place where everyone comes back and remembers school years with love.” The students’ personal involvement in democratic decision-making governance: The walls of the school are painted by the children themselves to make them feel they are a part of the school.

The students also considered the physical environment – schools as safe and green learning places: There are trees in front of school area, a park, flowers, recycling places. My future school has a welcoming atmosphere, large library and healthy food.

They dream of future schools as places where children feel welcomed; this is the kind of school that offers healthy food and is concerned about environmental issues: We shall have a large dining room where we can eat fresh, healthy and natural food.

As far as teachers working in these schools are concerned, the students see them as professionals with a decent salary who educate future responsible citizens of a great country. Moreover, teachers must be balanced, merry, educated and cheerful so that they can inspire and comfort children when necessary. All students want their teachers to be competent, friendly, supportive and responsive to the their students’ needs.

And friendly learning environment is favourable for learning: The atmosphere must be friendly. All children should respect each other, help and feel at school as they do at home. Future schools are envisioned as favourable places for learning, involving outdoor learning experiences, based on the philosophy of holistically raised children, paying attention not only to the cognitive aspects of learning, but also to values.
Schools that equip children with the skills needed for life in the 21\textsuperscript{st} century are of great importance: We will learn important things about life, as well as survival skills. Students pointed to the need to narrow the gap between what is taught at school and the skills needed for survival in the 21\textsuperscript{st} century.

**Suggestions for Teacher Trainers in Engaging Students in Envisioning the Future**

Young people need to be given time and space to envision future scenarios in order to be involved actively in the process of creating their own meaning and in making a sustainable education a reality. Young people need to be encouraged to think continually in new ways and to question present trends, ways of living and think about the planet Earth. The most important aspects in teaching is experiential education, employing students’ personal experiences and beliefs and applying them to develop practical wisdom which can lead them to live as open and sensitive individuals. This will lead to changing students’ beliefs and behaviours.

Students’ skills and competencies required to live in a future society includes: expressing one’s own ideas; listening to others; respecting other people’s views; cooperating; taking responsibility; reflecting and participating; testing one’s arguments; having a critical and open mind and making democratic decisions. This will equip youngsters with the skills that would enable them to build a sustainable future.

Envisioning the future needs to begin with the exploration of participants’ worldviews and beliefs, and it needs to be carried out in a systematic and authentic way. Future visions can empower individuals to make decisions about their preferred futures, which would involve clarity of underpinning values, rather than simply working along a predetermined path. There is a need for a clear accounting of whose voices that are being represented in future visions and the ways those visions are produced.

The future school should be a mission driven towards the goals of sustainable education. The schools’ accountability is based on a mission statement about how to make a vision of a sustainable school a reality. Schools should have a capacity to empower young learners to fulfil their sustainability vision in the learning environment and beyond. To meet the needs of a younger generation, schools needs to place emphasis on teamwork, participation, sharing responsibility, empowering, along with a new kind of managerial structure possessing a long term strategy.

Schools require changing the culture of teaching and learning in ways that enable students to become responsible for the future school and society. The future school needs to commit itself to the goal sustainability and to be responsible for promoting ecologically sustainable local communities.

Schools need to initiate ecologically sustainable everyday practices. Sustainable changes in education require redefining a mainstream curriculum that will enable students to become aware of unsustainable practices around them and to accept the responsibility of envisioning and bringing forward a more sustainable society. Teachers’ autonomy and direct involvement can be ensured in various ways, namely, by identifying the most problematic aspects of schooling that need to be changed, as well as their greater involvement in the improvement of current instructional practices.

Schools should play a crucial role in assisting change towards a sustainable future. Schools should model sustainable thinking and behaviour for the students, fostered by
their sustainable policy and everyday strategies. The major task of schools, apart from forming solid knowledge base, is to develop students’ beliefs by forming values and constructive attitudes to an envisioned perspective of a sustainable community.

Concluding Remarks

Envisioning the future is a complicated and transformative challenge set for university educators. Although it is not possible to predict the future, university students together with their teachers can envision and create the future they want to live in.

Integration of a learning experience that fosters the development of skills needed for the future society such as critical thinking, problem solving, creativity and innovation skills, collaboration skills, contextual learning skills, self-direction, as well as communication skills is essentially important in making sustainability a reality.

The data gained via individual interviews and focus group interviews indicate that the students expressed powerlessness and despair about the future with regards to unemployment, environmental issues and the lack of inspiring and sustainable leadership. Life story interviews were chosen to uncover deeper and underlying attitudes, thus placing this negativity in perspective.

Students’ ‘feared futures’ (Boulding, 1988) were related to political, environmental, social, economic and cultural unsustainability, particularly the lack of sustainable leadership, agency, environmental degradation, exclusio, and the predominantly materialistic and consumer culture.

Students’ ‘preferred’ and ‘desired futures’ highlight a hope of sustainable leadership for promoting the well-being of the planet, equity, greening and caring for the environment. The ‘preferred future’ scenarios of bachelor’s degree students are quite optimistic, in a way a little bit naive, as compared with the master’s degree students whose visions are more pronounced and well-grounded in current day reality, while ‘proactive futures’ (Hutchinson, 1994) provide images of society where each individual undertakes initiative and responsibility in building a more sustainable school and a society.

The ‘envisioned preferable future’ scenarios by the students helped them to discover new relationships and possibilities in moral and social domains. The development of constructive and systematic beliefs and the acceptance of social responsibility for the sustainable future was a contributing factor in this particular study. By engaging in envisioning the future, the students have learned how they come to believe what they believe and how those beliefs permeate their daily lives.

We believe that this is essential to provide spaces and new, open-minded, reflective and participative learning cultures where each participant can explore his/her potential for a sustainable future. In line with Rieckman (2012) and Lambrechts, Mula, Ceulemans, Molderez and Gaeremynck (2013), the authors see the potential of university educators to create learning environments favourable for engaging students in co-creating a preferable future.

Acknowledgement

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The Journey towards a Teacher’s Ecological Self: A Case Study of a Student Teacher

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Abstract
Transforming our educational systems to support sustainable development is a challenge that involves all levels of education – policy, curriculum and pedagogical practice. One critical dimension to look at is a teacher’s identity as it influences a teacher’s decision-making, behaviour and action. The ecological self is the concept that is used in the context of sustainability. This paper discusses the emerging ecological self of one student teacher during her initial teacher education programme. The concepts of the teacher’s self and the ecological self form a lens through which the story of this student teacher is examined. The paper focuses on one part of a broader, longitudinal study of student teachers and their understanding of pedagogy and connectedness with nature in the context of the need for reorienting teacher education towards sustainability. Sterling’s (2001) conceptual framework of ecological view on education is taken as a tool to analyse the collected data. The results indicate that deep connectedness to nature and empathy are framing the holistic view on learning, teaching and a teacher’s self.

Keywords: teacher education, student teacher’s identity, ecological self, sustainability, worldviews

The idea of sustainable development as a concern for creating and sustaining the conditions for current and future generations to live well on the Earth was introduced by Brown (1981) and was adopted by the United Nation’s World Commission on Environment and Development (WCED, 1987), “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (p. 43). According to Ospina (2000), sustainability is primarily a “moral precept” (p. 32), because the problem of “sustainability is not a problem of and for the Earth, but a human values problem” (Babiuk & Falkenberg, 2010, p. 9). Accordingly, sustainable development requires changes in values and attitudes towards the environment (WCED, 1987). Education – a particular formal education – has to play a central role in achieving those changes in values and attitudes. Recognising that
teacher education through its mandate of preparing teachers for their educational work plays an important support role for this educational undertaking, the United Nations Educational, Scientific and Cultural Organization (UNESCO) initiated in 1998 and has been supporting effort for reorienting teacher education towards sustainability, which was followed by the formation of an international network of teacher education institutions (McKeown & Hopkins, 2007). The literature on reorienting teacher education towards sustainability around the world highlights promising exemplars, but it also paints a picture of very slow progress (Sims & Falkenberg, 2014). With a number of important institutional challenges to such a reorientation towards sustainability (Hopkins & McKeown, 2005), there is also the fundamental challenge for teacher education. This paper engages with this latter challenge through a case study of one student teacher and the development of her “ecological self”. The next section will outline the theoretical framework for the case study, which will involve the notions of the self of a teacher more generally and a teacher’s ecological self, more specifically.

**Theoretical Framework**

The theoretical framework that underlies the case study reported upon in this paper has two components: the first one deals with the notion of a teacher’s self and its role in teacher education, but the second one concerns what has been called a person’s “ecological self” (Naess, 1987/1995), a notion we want to expand to a “teacher’s ecological self”. We shall outline the two components of the framework in turn.

**A Teacher’s Self and Its Role in Teaching and Teacher Education**

A teacher’s identity and self have been identified as important constructs in teacher education (Beijaard, Meijer, & Verloop, 2004; Nias, 1993; Olsen, 2008). One particular approach to a teacher’s self that fits this perspective and that we like to draw upon as part of our study’s theoretical framework is Korthagen’s (2004, 2013) “onion model,” which he conceptualises as “a model of levels of change” (Korthagen, 2004, p. 80), which we look at as a model of the different layers that make up a teacher’s self. There are five such layers that are ordered from “outside” to “inside”, hence, the “onion” model: a teacher’s behaviour; a teacher’s competencies; a teacher’s beliefs; a teacher’s identity and a teacher’s mission. Thus, a teacher’s self is characterised by his/her behaviour, competencies, beliefs, identity and mission. The image of the layers of an onion make two central features of a teacher’s self clear, features that we adopt as part of our theoretical framework: that all layers are “touching” each other, either directly or indirectly; and that it is more difficult to get at the inner layers than the outer layers. A teacher’s “behaviour, his or her being is grounded in an awareness of self, mission and core qualities” (Korthagen, Hoekstra, & Meijer, 2014, p. 80). There is a certain alignment between the layers: for instance, one’s mission as a teacher should be aligned or in harmony with one’s beliefs about teaching and learning, and those beliefs should be aligned with one’s behaviour. The problems here is that the “self concepts are quite resistant to change” (Korthagen, 2004, p. 83).

It is obvious what important role a teacher’s self, as conceptualised in such a way, plays for a teaching practice and also for professional development of a teacher. In order to align the “layers” of a teacher’s self, a teacher’s behaviours, competency develop-
ment and beliefs need to be aligned with his/her mission and identity as a teacher and a person. This means that teaching cannot be seen as being solely a matter of a teacher’s behaviour and competency, but also as a matter of his/her beliefs, identity and mission. This also makes clear the important role a student teacher’s self plays for the design and practice of a teacher education programme that wants to impact a student teacher’s teaching practice: the programme cannot only focus on the student teacher’s teaching behaviour and his/her teaching competencies, but must also give consideration to his/her beliefs, identity and even mission (in life and teaching).

The Ecological Self and Its Role in Teaching and Teacher Education

Hedlund-de Witt (2013a, b) suggests that an understanding of worldviews – which we can understand as a construct made up of the three inner layers of a person’s self: a mission, an identity and beliefs – has a major role in addressing our highly complex, multifaceted, interwoven, planetary sustainability issues. She draws attention to the understanding of several authors (Hulme, 2009; Vonk, 2011) that worldviews are a “root-cause” of our sustainability challenges. Worldviews are clearly important in searching for solutions to the problems our societies are facing.

This perspective gives rise to the notion of “ecological self”, which is at the core of the deep ecology movement (Dregenson & Inoue, 1995), which started with Naess (1973). The ecological self is a deepened and widened self whose identity (the second inner layer) is one that identifies with one’s natural ecology into which one is embedded so that any destruction of that natural ecology is a destruction of one’s self (Naess, 1987/1995).

The role of the ecological self in teaching and teacher education becomes clear when one draws on Sterling’s (2001) dichotomy between a mechanistic (instrumental) and a holistic (ecological) view of the world, which, in turn, leads to a dichotomy in the view of teaching and learning between a mechanistic (instrumental) and a holistic (ecological) view of educational values (Table 1) and teaching and learning (Table 2).

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Mechanistic and Ecological/Holistic Educational Paradigms (Sterling, 2001)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanistic View</td>
<td>Ecological/Holistic View</td>
</tr>
<tr>
<td>Preparation for economic life</td>
<td>Participation in all dimensions of the sustainability transition-social, economic, environmental</td>
</tr>
<tr>
<td>Selection or exclusion</td>
<td>Inclusion and valuing of all people</td>
</tr>
<tr>
<td>Formal education</td>
<td>Learning throughout life</td>
</tr>
<tr>
<td>Knowing as instrumental value</td>
<td>Being/becoming (intrinsic/instrumental values)</td>
</tr>
<tr>
<td>Competition</td>
<td>Co-operation, collaboration</td>
</tr>
<tr>
<td>Socialization, integrating to fit</td>
<td>Autonomy-in-relation</td>
</tr>
<tr>
<td>Effective learning</td>
<td>Transformative learning</td>
</tr>
<tr>
<td>Standardisation</td>
<td>Diversity with coherence</td>
</tr>
<tr>
<td>Accountability</td>
<td>Responsibility</td>
</tr>
<tr>
<td>Specialisation</td>
<td>Integrative understanding</td>
</tr>
<tr>
<td>Faith in “the system”</td>
<td>Faith in people</td>
</tr>
<tr>
<td>Modernity</td>
<td>Ecological sustainability</td>
</tr>
</tbody>
</table>
Table 2

**Mechanistic and Ecological/Holistic Views of Teaching and Learning (Sterling, 2001)**

<table>
<thead>
<tr>
<th>Mechanistic View</th>
<th>Ecological View</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission</td>
<td>Transformation</td>
</tr>
<tr>
<td>Product oriented</td>
<td>Process, development, action oriented</td>
</tr>
<tr>
<td>Emphasis on teaching</td>
<td>Integrative view: teachers also learners, learners also teachers</td>
</tr>
<tr>
<td>Functional competence</td>
<td>Functional, critical and creative competencies valued</td>
</tr>
</tbody>
</table>

**View of learner**

| As a cognitive being                     | As a whole person with full range of needs and capacities |
| Deficiency model                         | Existing knowledge, beliefs and feelings valued           |
| Learners largely undifferentiated        | Differentiated needs recognised                          |
| Valuing intellect                        | Intellect, intuition and capability valued               |
| Logical and linguistic intelligence      | Multiple intelligences                                   |
| Teachers as technicians                  | Teachers as reflective practitioners and change agents    |
| Learners as individuals                  | Groups, organisations and communities also learn         |

Table 1 and Table 2 illustrate how different the teaching behaviours and competencies, i.e. outer layers of a teacher’s self, match the mechanistic inner self from those that match the ecological, holistic inner self. The ecological self that addresses relevant worldview requires quite different competencies and behaviours from teachers, and, thus, also different approaches to teacher education.

The study that we report upon in this paper is a case study of the emerging ecological self of one particular student teacher enrolled in a particular master’s degree teacher education programme. The theoretical framework – the notion of a teacher’s self and the notion of the ecological self – was used as the framework for designing the case study and as a lens through which the data were analysed.

**Methodology**

The case study reported upon in this paper is part of a broader, longitudinal study investigating the student teachers’ emerging ecological self while enrolled in a teacher education programme. We consider the case we report upon in this paper a critical case (Yin, 2009), which allows us to better understand what the emerging ecological self in student teachers could look like. Such an understanding would be of great benefit to the educational endeavour of reorienting teacher education towards sustainability.

The female student teacher presented in this case study, whom we gave the pseudonym Marygold for the purpose of the study, attended a teacher education programme at a Baltic university at the time the data for the study were collected. Marygold, as one of the participants of the broader study, was selected to take part in the study. The aim of the broader 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. The broader, longitudinal study, from which the data for the case study were drawn, involved nine student teachers.
and collected data during a four-year-period, starting at the beginning of their studies and ending with the final year of their studies, leaving out the final year of the master’s thesis work. After an initial analysis of the data, during the third year of studies, Marygold stood out as a critical case for the study of the emerging ecological self in student teachers, so much so that we decided to report on her case separately in this paper as a critical case study. The data for this case study were drawn from that part of the broader study that investigated the student teachers’ worldviews and attitudes related to pedagogy and nature. For this part of the study, the written open-ended questions (OEQ) included questions about the understanding of learning and teaching, description of a favorite or ideal teacher, personal memories of school, motivation and mission to become a teacher. The questions of the semi-structured interviews (INT) aimed at a deeper discussion of the student teachers’ understanding of learning and teaching, their views of the qualities and competencies of good teachers and what they would consider their mission in becoming a teacher is.

For the data analysis, first, the written text responses to open-ended questions and the transcribed interview data were read several times to find emerging themes. Inductive content analysis was used in order to categorise themes emerging from the text data, which then were reduced to the main categories (Mayring, 2000). Using the theoretical framework outlined above, categories concerning attitudes towards nature and pedagogy were unified as aspects of a central category to be investigated.

Findings and Discussion

The findings section is divided into two parts, reflecting the two aspects of our theoretical framework. The first section will describe and discuss the findings linked to Marygold’s teacher self with a focus on the three inner layers of a teacher’s self: a mission, an identity and beliefs. The second section will describe and discuss the findings linked to Marygold’s ecological self.

A Teacher’s Self: A Mission, an Identity and Beliefs

Marygold comes from a family of teachers (“I was really proud of them”, she says.), so her background has given a certain level of understanding of a teacher’s work. A mission of her life – what inspires her as a future teacher – is to be as good a teacher as her favourite teacher, who makes students think, develops their worldviews and guides their development. The quotation also suggests a number of beliefs that Marygold holds about teaching: teaching is about making students think, developing their worldviews and guiding their development; being a teacher is like being a parent of one’s students. Beliefs and mission seem to be well-aligned, as Korthagen (2013) has suggested is the case for those teachers who “teach from within”.

When I was little, I thought that teaching was a very appreciated job, with a mission, because some of my mother’s students were practically like the members of our family... My favourite teacher could make us think, contemplate on things, she managed to develop our worldviews... (for me) teaching is guiding, being an example, supporting children’s development. I would like to be as my favourite teacher was. The aim of that is to see good sides and
potential in every student and helping them to develop this potential better...
A teacher is still like another mother for a child, not directly, but still indirectly...
She should be a well-educated person... I mean know her subject, but knowing also about greater, worldly matters... I am actually really eager to see how I manage with that. (Marygold, OEQ)

Marygold’s experience of her mother’s students being like family members seems to have shaped her belief that teachers should be like the parents of her students. Nias’s (1989) remark on Peztalozzi, who suggested that a teacher should live and work among his/her pupils, seems to have been a reality in Marygold’s mother’s case.

Marygold refers to her being abroad for a longer period, opening her eyes to what teaching and learning should really be, comparing the experience to what she had at school.

When I was in primary school and in secondary school, I thought that this is how things should be [teachers teach and students learn by heart], but after that... my eyes opened. I saw that teaching can be approached differently. ...well... I am very demanding, and I never actually accuse anyone, but... I think that a teacher should be always an example for students. And a student should be striving to be exemplary... This makes teaching so much easier for a teacher and, actually, for a student as well. I have had such teachers. (Marygold, INT)

This quotation illustrates well how certain kinds of life experiences – in Marygold’s case, experiences of teaching and learning abroad – can shape a student teacher’s beliefs about teaching and, as in Marygold’s case, her mission in life (to become a teacher who is like her favourite teacher). Marygold is striving to be an example to her students. Being demanding, as she says, shows that she is not ready to compromise on important matters like learning; this also is part of her identity as a teacher, who she is in her work as a teacher.

The few quotations illustrate our understanding of Marygold’s teacher self – her mission, identity and beliefs about teaching and being a teacher. The next section will use the data from Marygold to illustrate an emergent ecological self as outlined in the theoretical framework.

A Teacher’s Ecological Self

The following tables use data collected from Marygold to illustrate how Marygold’s self fits well with the ecological/holistic educational paradigm identified by Sterling (2001) and referenced above (Table 1) as well as with Sterling’s (2001) ecological view of teaching and learning (Table 2). Accordingly, Marygold’s understanding is differentiated into the categories (Table 3).
Table 3
Marygold: Ecological/Holistic Educational Paradigm

<table>
<thead>
<tr>
<th>Ecological/Holistic Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclusion and valuing of all people</td>
</tr>
<tr>
<td><em>The aim of that is to see good sides and potential in every student and helping to develop this potential better.</em> (Marygold, OEQ)</td>
</tr>
<tr>
<td>Being/becoming (intrinsic/instrumental values)</td>
</tr>
<tr>
<td><em>I think educating means helping the student to find his/her path.</em> (Marygold, OEQ)</td>
</tr>
<tr>
<td>Co-operation, collaboration</td>
</tr>
<tr>
<td><em>It (learning) could be like everything is... like worked through together (by a teacher and students).</em> (Marygold, OEQ)</td>
</tr>
<tr>
<td>Autonomy-in-relation</td>
</tr>
<tr>
<td><em>... it was not like that you got some real insights, a greater understanding... I didn’t like it. Maybe others want to study like that, but I don’t. Referring to her decision about career choice.</em> (Marygold, INT)</td>
</tr>
<tr>
<td>Integrative understanding</td>
</tr>
<tr>
<td><em>I mean knowing her subject, but knowing also greater, worldly matters.</em> (Marygold, INT)</td>
</tr>
<tr>
<td>Faith in people</td>
</tr>
<tr>
<td><em>When I wake up in the morning and think that all people are good and the sun is shining and today is a wonderful morning... and I just go and take a walk. This worldview seems naive and too young, but this is how I can manage with life. This thought actually scares me now-if I would think ill thoughts about people. I’ll try to see good in everyone; if there is a bad-behaving child, then there is a reason for that. No person is born bad. They grow to be like that. This is what I think.</em> (Marygold, INT)</td>
</tr>
</tbody>
</table>

Table 4 gives a summary of Marygold’s holistic understanding of what teaching and learning is or should be.

Table 4
Marygold: Ecological/Holistic View of Teaching and Learning

<table>
<thead>
<tr>
<th>Ecological View on Learning and Pedagogy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transformation</td>
</tr>
<tr>
<td><em>I think educating means helping the student to find his path. ... what you are good at and how to (benefit) from it in the future.</em> (Marygold, OEQ)</td>
</tr>
<tr>
<td>As a whole person with full range of needs and capacities</td>
</tr>
<tr>
<td><em>The aim of that is to see good sides and potential in every student and helping to develop this potential better.</em> (Marygold, OEQ)</td>
</tr>
<tr>
<td>Differentiated needs are recognised.</td>
</tr>
<tr>
<td><em>For example, if a student likes to read, he/she can get knowledge and background information, which is very important to ground the knowledge, by reading. Or when some other student likes to put everything down in writing ... so ... bow and in what way ... all this.</em> (Marygold, OEQ)</td>
</tr>
<tr>
<td>Teachers as reflective practitioners and change agents</td>
</tr>
<tr>
<td><em>My favourite teacher could make us think, contemplate on things, she managed to develop our worldviews (for me) teaching is guiding, being an example, supporting a child’s development.</em> (Marygold, OEQ)</td>
</tr>
<tr>
<td>Groups, organisations and communities also learn, and teachers are learners too.</td>
</tr>
<tr>
<td><em>(Learning) could be like everything is... like working through together. New alternatives are seen, problems are solved, not created instead.</em> (Marygold, OEQ)</td>
</tr>
</tbody>
</table>
In exploring further Marygold’s ecological self, we focus on one particular aspect of her ecological self, namely her relationship with nature, which is central to Naess’s (1987/1995) understanding of the ecological self. Marygold’s relationship with nature as an integral component of her ecological self emerges in her stories when she discusses everyday life and her attitude towards nature. Knowledge about nature comes from her childhood, as her mother introduced her to different species during long walks in natural environment. Marygold confesses that she is actually afraid of being in nature alone, explaining that she is not used to it and that she has not had the chance to be alone in nature so much. At the same time, she longs for a deeper experience and wants to spend more time in nature, practicing this connectedness. Despite being afraid, she is aware of the reasons for it, and she sees the value of connectedness, understands the need for developing it.

Someday, I would like to live in connection with nature. I think the more we consume, the worse and I am really in favour of everything [that protects nature]... but I think that we have not yet come to the situation where people and nature can unite. We just don’t have... the world has to change for that. I believe that these changes will occur; just a lot of time has to pass, maybe 200 or 300 years. I don’t believe my eyes will actually see an ideal world. (Marygold, INT)

Marygold sees the separation from nature as being something unnatural and considers modern lifestyles a cause for this separation, but she also hopes that the situation will change. The ideal world for her is when people feel connected with nature. This reflects the core idea of Naess’s (1987/1995) notion of the ecological self, which is even more explicitly expressed in the following description.

I think that a human being and nature have been separated so much now, that humans begin to change into something else. We shall evolve and develop into something different than we would be if we lived in harmony with nature. Well, you can see it, really, sure. Even our reflexes change and everything. People cannot see things in depth, they cannot concentrate, just to be there... I myself, I am not perfect at all. I think, today, being eco-friendly is a full-time job, to be with nature in our times. There is a long way to go... but I totally enjoy and value those moments when I can leave my phone or there is no connection – this is a wonderful and comfortable reality then. (Marygold, INT)

Looking at the separation of people from nature, she sees it as an unnatural process that changes the very core of being a human. Despite worrying that she is not able to see how the connection can be restored, she sees hopeful tendencies. When it comes to other people, Marygold prefers to search for good qualities in them. There is always a reason, a set of environmental factors that negatively influence people’s actions and behaviors.

When I wake up in the morning, I think that all people are good and the sun is shining and today is a wonderful morning... and I just go and take a walk. This worldview seems naive and too young, but this is how I can manage with life. This thought actually scares me now – if I would think bad thoughts
about people. I’ll try to see good in everyone; if there is a bad-behaving child, then there is a reason for that. No person is born bad. They grow to be like that. This is what I think. (Marygold, INT)

In the next quotation she talks about the inner beliefs of her ecological self; she sees that the “Greater Being” is in every one of us, which is a view often found in the deep ecology movement (Berry, 1988), as well as in the literature on the role of spirituality in education (Miller, 2000). While not always explicitly linked to the literature on spirituality, Marygold’s view is connected with whole systems thinking that is influencing stewardship (Senge, 1990; Senge, Smith, Kruschwitz, Laur, & Schley, 2008).

I believe in myself. I believe there is something greater inside me. When some people pray to God, I ask for those things for myself. I ask to be better, I ask for more dignity, to be more pretty... whatever. This is with everything, it is so special really, that we talk, communicate, are alive. This is so much bigger than that. And it all is in us. It is also, in the same way, special, as we wake up in the morning and use this incredible day, what has been given to us, what we are supposed to be happy about. Either we talk about the neighbour all day (referring to meaningless chat about other people), or we do what we really like to do (referring to meaningful actions one should do). In a real way... (Marygold, INT)

The feeling of oneness she expresses here, that all people share something that is the same, reflects the altruistic self very well. Naess (1987/1995) speaks about as a core aspect of the ecological self. The importance of an individual’s effort for the greater good is linked to the point that Makrakis and Kousoulas-Makrakis (2012) made about teaching and creating a teacher education curricula. They stress that we should bear in mind that the learners have to be able to transform themselves and society, which makes it especially important to address the notion of self in the context of teacher education for sustainability. Also, Marygold seems to understand that everything we do or say may have a far broader influence on the world; again a view inherent in the scholarship of whole systems.

Conclusion

As it has been stated, reorienting teacher education towards sustainability has been recognised as an important approach to address the urgent need for sustainable development, i.e., creating and sustaining the conditions for current and future generations to live well on the Earth. The work by deep ecologists like Naess (1973) provides an understanding of the importance of our selves (particularly our mission in life, our identity and our beliefs) for creating and sustaining those conditions. Thus, the concern for developing our ecological selves, as conceptualised by deep ecologists like Naess, 1987/1995, needs to become an important focus for reorienting teacher education for sustainability. While Sterling (2001) provides a conceptual framework for a greater understanding teachers’ ecological selves, the question about what those ecological selves actually look like in teachers, why and how they emerge remain unanswered. When analysing data for the broader study mentioned above, Marygold’s responses stood out as what we would consider a critical case for a deeper understanding what a developing ecological
self in student teachers might look like. Our analysis and discussion on her response
data from the broader study, we hope, provides a helpful case study of a developing
teacher’s ecological self for the purpose of addressing issues related to the development
of teacher education towards sustainability. We think that this case study can do so in
two important ways. First, the core layers of a student teacher’s ecological self-mission,
identity and beliefs, as identified in the core reflection approach to teacher education
(Korthagen, 2013), have been illustrated through the personal story of a particular
student teacher. This illustration, through a concrete case, can help sensitise teachers’
educators to the qualities that characterise an ecological self in terms of one’s mission,
identity and beliefs. It seems to us that being sensitised as a teachers’ educator to those
qualities is a prerequisite for working with student teachers with the goal of reorienting
teacher education towards sustainability. Murray (2011) has made a strong argument
for the importance of “the sustainable self” for education for sustainable development.
In his book “Sustainable Self”, he provides pedagogical models and concrete methods
to approach the construction of sustainable self during the learning process.

Our case study can also support the design of further studies on evolving student
teachers’ identities. Of course, one case study does not provide enough evidence to make
profound conclusions or suggestions, but it enables readers to consider different aspects
when we discuss more diverse studies in the field. A second way in which we think our
critical case study can support reorienting teacher education towards sustainability is
by providing a concrete illustration of the theoretical framework provided by deep
ecologists for reorienting teacher education for sustainability. Marygold’s responses
illustrate what Naess’s (1987/1995) notion of the ecological self can look like in the
context of teaching, and they illustrate what Sterling’s (2001) ecological/holistic educa-
tional paradigm and ecological view on learning and pedagogy mean. We suggest that
these theoretical frameworks are of great importance to a systematic approach to
reorienting teacher education towards sustainability, thus having an illustrative example
for those theoretical constructs could be helpful – also for future studies on evolving
student teachers’ identities.

Reorienting teacher education towards sustainability means that teacher education
programmes need to work “from within” (Korthagen, Kim, & Greene, 2013) with
student teachers’ selves, and a clear understanding of what ecological selves “look like”
can represent an important aspect of such work from within.

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