Exploring the concept of Sustainable Development within Education for Sustainable Development: implications for ESD research and practice

Exploring the concept of Sustainable Development within Education for Sustainable Development: implications for ESD research and practice

Eleni Sinakou[1]

Jelle Boeve-de Pauw[2]

Peter Van Petegem[3]

[1]Research Unit Edubron, Department of Training and Education Sciences, Faculty of Social Sciences, University of Antwerp, Belgium.

[2]Research Unit Edubron, Department of Training and Education Sciences, Faculty of Social Sciences, University of Antwerp, Belgium.

[3]Research Unit Edubron, Department of Training and Education Sciences, Faculty of Social Sciences, University of Antwerp, Belgium.

Corresponding author
Eleni Sinakou, E-mail: Eleni.Sinakou@student.uantwerpen.be,
Tel:+32(0)466132961.

ORCID
Eleni Sinakou
http://orcid.org/0000-0001-7637-8892
Jelle Boeve-de Pauw
http://orcid.org/0000-0002-8496-096X
Peter Van Petegem
http://orcid.org/0000-0002-4078-7800

Acknowledgements

The authors acknowledge the financial support of Alexander S. Onassis Public Benefit Foundation, Greece through a grant awarded to Eleni Sinakou, PhD Candidate [grant number F ZL 089-1, 2015-2016].

Conflict of Interest: The authors declare that they have no conflict of interest.

Exploring the concept of Sustainable Development within Education for Sustainable Development: implications for ESD research and practice

Abstract

This paper explores how three major factors in Education for Sustainable Development (ESD) practice view the concept of Sustainable Development (SD). These are (a) international policy documents which shaped ESD, (b) the academic discourse in the field of ESD as well as (c) students and teachers. SD is a complex concept and it can be interpreted in several ways. This paper adopts a holistic approach to SD, according to which, SD is considered an integrated concept of three dimensions, namely the environment, the economy and the society. The significance of the holistic approach to the SD concept is emphasized in the recent international policy documents and by the academic discourse, as well. However, teachers and students do not hold yet a holistic understanding of the concept. The purpose of this paper is to discuss this ESD policy-practice gap and to propose implications in ESD practice and research.

Keywords: Education for Sustainable Development; the concept of Sustainable Development; holistic approach, policy-practice gap.

Introduction

This paper investigates the concept of Sustainable Development (SD) (a) in international policy documents which shaped Education for Sustainable Development (ESD) (b) in the academic discourse in the field of ESD and (c) in the views of students and teachers. The above stakeholders influence one another and eventually, ESD practice. The purpose of this paper is to propose implications in ESD practice and research. This paper adopts a holistic approach to SD, meaning that SD is considered as an integrated concept of three pillars: Environment, Economy and Society (Giddings, Hopwood & O'Brien 2002). Accordingly, ESD addresses sustainable development issues, which are not only environmental problems but also social and economic ones (e.g. Corney and Reid 2007).

The SD concept in international policy documents

The 1987 Brundtland Report, titled 'Our Common Future', officially introduced the idea of sustainable development and acknowledged the interconnection of ecological, economic and social systems (Evans 2010). While the Belgrade and the Tbilisi reports refer to 'environment' only, Agenda 21 speaks of 'environment and development' (Gough 1997), thus moving closer towards social and economic issues (Stevenson 2006). Although social and economic issues were also mentioned in the prior documents, they were not emphasized (Stevenson 2006). Agenda 21 (UN, 1992, p.320) makes it explicit that in order to be effective, environmental education and development education should deal with all aspects of our environment, that is, the ecological and physical/biological environment as well as the socio-economic one. As

Evans states (2010, p.44) '*Agenda 21 was a blueprint for sustainable development*'. The Declaration of Thessaloniki in 1997 was an attempt towards the implementation of Agenda 21.

The Johannesburg Summit in 2002 reaffirmed that the three dimensions of SD must form the content of sustainable learning (Roorda 2010). The Johannesburg Declaration underlines that '*the interdependent and mutually reinforcing'* pillars of SD should be strengthened (UN, 2002, para 5). The next passage in The Johannesburg Declaration (para 8) trails the journey of Environmental and Sustainability Education Research (ESER), as it has come to be called nowadays, from Stockholm to Rio and from Rio to Johannesburg. In Stockholm, back in 1997, the matter of concern was environmental degradation, whereas in Rio, the focus of the discussion lay not only on the protection of the environment, but also on social and economic development, which are seen as the fundaments of SD. This represents a more integrated view of SD, since it does not limit its scope but it refers to SD as a whole.

'*Thirty years ago, in Stockholm, we agreed on the urgent need to respond to the problem of environmental deterioration. Ten years ago, at the United Nations Conference on Environment and Development, held in Rio de Janeiro, we agreed that the protection of the environment and social and economic development are fundamental to sustainable development, based on the Rio Principles…At the Johannesburg Summit, we have achieved much in bringing together a rich tapestry of peoples and views in a constructive search for a common path towards a world that respects and implements the vision of sustainable development.*' (UN, 2002, para 8).

Unlike the Thessaloniki Declaration, the Johannesburg Declaration, puts greater emphasis on social issues, such as poverty. The Thessaloniki Declaration sees poverty as an issue linked to environmental degradation (UNESCO 1997), while the Johannesburg Declaration refers to poverty eradication as one of the '*essential requirements for sustainable development*' (UN, 2002, para 11). Even the terminology chosen reveals a change in orientation. The Thessaloniki Declaration merely refers to 'poverty' (UNESCO 1997, para 7), whereas the Johannesburg Declaration refers to 'poverty eradication' (para 7, 11, 21). This change shows an evolution in the way of perceiving poverty. The term '*poverty eradication'* depicts an attempt to determine the issue of poverty in a more concise way in order to make it palpable.

According to the framework for the United Nations Decade of Education for Sustainable Development, namely the 'International Implementation Scheme' (UNESCO, 2006), the Decade should inspire changes in behaviour towards a more sustainable world in respect of environmental integrity, viable economic activity, and social justice for both present and future generations (UNESCO 2006). This implies that SD issues arise from all three aspects of SD. UNESCO (2006) describes the three dimensions of SD by identifying fifteen sub-themes regarding education and learning for SD. The Bonn Declaration, half-way through the Decade in 2009, is this international policy document which, according to Lotz-Sisitka (2009) makes it clear that a balanced relationship among environment, society and economy is necessary to further advance SD. In addition to this, this is the first international declaration that

puts emphasis on ESD rather than EE (Environmental Education) (Lotz-Sisitka 2009). EE and ESD are distinct but complementary (McKeown and Hopkins 2003). EE focuses more on environmental protection, whereas ESD takes into consideration economic and human development related to environmental protection (McKeown and Hopkins 2003).

At the very beginning of the document: 'Transforming our world: The 2030 Agenda for Sustainable Development.' (UN, 2015, para 13), it is stated that SD is about combatting poverty, coping with inequalities, facilitating social inclusion as well as protecting the environment and developing viable economic strategies. All these are interdependent on one another. It is also mentioned that '*It is important to recognize the link between sustainable development and other relevant ongoing processes in the economic, social and environmental fields*.' (UN, 2015, para 55). The Agenda 2030, sets a series of 17 Sustainable Development Goals to be achieved until 2030 (UN 2015). The concept of SD is determined in this agenda by exposing means of its implementation, that is, the goals and their relevant targets, rather than defining the concept. Although Agenda 21 outlines the SD issues in a more specific way (see section I &II of Agenda 2, UN, 1992) than the previous documents, Agenda 2030 describes the SD issues in an even more detailed way. The targets are quite often explained by using issues included in the description of other goals. Accordingly, there are interlinks among the target and the goals. As stated in Agenda 2030, the goals and targets of the agenda are '*integrated and indivisible'* (UN, 2015, para 2, 5, 18 and 55). The authors argue that Agenda 2030 puts a greater emphasis on the integration and balance among the dimensions of SD than the previous policy documents. The same goes for the Global Action Programme (GAP), issued at the World Conference on ESD in 2014 (Aichi-Nagoya, Japan), since it takes into consideration the global discussions on the post-2015 development agenda (UNESCO 2014b), namely Agenda 2030. As it is stated in the GAP, it '*is intended as a concrete, tangible contribution to the post-2015 agenda.*' (UNESCO, 2014b, p. 14).

The SD concept in the ESD discourse and practice

The concept of SD is not static but rather dynamic (Berglund, Gericke and Chang Rundgren 2014). This means that the concept of SD can be understood in several ways according to several perspectives. Furthermore, the SD concept refers to an endless process, i.e. development (Berglund et al. 2014). Due to the dynamic nature of the concept, there is no tangible definition. In addition to this, the terms *sustainability* and *sustainable development* are used vice versa by groups that support conflicting interests (see discussion in Jickling and Wals 2008). This makes it even more difficult to grasp a clear meaning of sustainability and sustainable development. However, we can distinguish them by the fact that sustainable development is deemed as a process but sustainability as a goal (Scott and Gough 2003).

When attempting to define SD or sustainability, we have to confront a series of challenges. First of all, SD is a complex concept and can be interpreted in various ways depending on different disciplines or social and cultural contexts (Berglund et al. 2014). SD issues are complicated due to the interconnections among them and the

interactions between social, natural and economic systems (Wuelser, Pohl and Hirsch Hadorn 2012). Further obstacles to define SD are posed by the intersection of various disciplines, the several processes that go on simultaneously on temporal and scale levels (Van Asselt and Rijkens-Klomp 2002) and ethical aspects of SD issues (Andersson 2008). Bonnett (2002) raises epistemological concerns about the intended SD goal (what should be sustained, by whom and for whom) as well as the means of achieving this goal. Besides complexity, uncertainty characterizes SD, as well. It is impossible to predict which practices will lead to future change and what will be their consequences (Newman 2006). Even if the concept is "ill-defined" (Van Weelie and Wals 2002), it is applicable in practice (Corcoran and Wals 2004). In addition, we would argue that debating around the SD concept enables us to get engaged with richer explorations of the concept.

The idea of SD has been criticized on several grounds. Stables and Scott (2002) argue that SD is '*a paradoxical compound policy slogan'* (Stables and Scott, 2002, p. 42) since people with different philosophical and political views have an obscure idea as to what SD might mean. It is a fact that a wide range of stakeholders use the concept and attribute to it varying meanings (Hopwood, Mellor and O'Brien 2005). It is also argued that the term *sustainable development* combines two often contesting principles, namely, endless economic growth and sustainable use of natural resources (e.g. Jabareen 2008; Washington 2015). Kopnina (2102a) and Washington (2015) claim that sustainable development becomes then an 'oxymoron'. Critical scholars argue that the current patterns of economic development lead to environmental degradation (e.g. Rees 2010; Washington 2015; Hansen and Werthal 2014). They hold the view that the recent economic growth and industrialization in emerging economies fail to address the root of social inequalities and ruin the capacity of natural resources (Rees 2010; Bartlett 2012; Hansen and Wethal 2014). The creation of new labour markets and new groups of consumers provides benefits to the established corporate and political interest groups (Rees 1992; Washington 2015) as well as to profit-oriented government agencies and organizations (e.g. The World Bank) (Hansen and Wethal 2014). Also, the current patterns of economic development aggravate ecological injustice by promoting human welfare and distracting us from nature (e.g. Kopnina 2012a, b; Washington 2015; Bonnett 1999, 2002, 2007). Ecocentic scholars consider joint human and ecosystem well-being the core of sustainability (e.g. Crist 2008; Kopnina 2012a; Washington 2015).

Policy-makers and researchers have supported that the teaching approach towards ESD allows teachers to reveal the complexity of SD in education (Sandell, Öhman, Östman, Billingham and Lindman 2005). A holistic approach to ESD is often considered of high importance (see for example Gough 2002; Sandell et al. 2005; Corney 2006; Summers and Childs 2007; Olsson, Gericke and Chang Rundgren 2015; Boeve-de Pauw, Gericke, Olsson and Berglund 2015).

Research, however, shows that neither teachers nor students hold a holistic view of the SD concept. Both of them recognise the environmental dimension most (for student see Walshe 2008, 2013, 2016; Birdsall 2015, and for teachers see

Summers and Childs 2007; Summers, Corney and Childs 2004; Birdsall 2014; Kilinc and Aydin 2013; Borg, Gericke, Höglund and Bergman 2014.) The economic dimension is less recognised by students (Walshe 2013; Berglund et al. 2014) and they have vague perceptions of how economy is related to SD (Berglund and Gericke 2015). In line with students' conceptions of the economic dimension (Berglund and Gericke 2015), teachers feel unsure about economic factors related to SD issues (Borg et al. 2014). In general, it is hard for teachers to integrate the three dimensions of the concept of SD (Borg et al. 2014). They often hold a shallow and oversimplified understanding of sustainability (Birdsall 2014), or they hold misconceptions about the concept of SD (Spiropoulou, Antonakaki, Kontaxaki and Bouras 2007). Finally, they do not help students to develop a holistic view of SD when teaching ESD (Borg et al. 2014; Borg, Gericke, Höglund and Bergman 2012). Borg et al. (2012, 2014) and Boeve-de Pauw et al. (2015) found that there is an absence of good practices to inspire them and a lack of expertise on SD. At the same time, it might also be that the environmental aspect is by nature less complex and thus, easier for students to grasp (Walshe, 2013; Manni et al, 2013). Research shows that students often recognize the three pillars of SD but they have only a superficial understanding of them (Walshe, 2008) and they have problems in describing relationships between the aspects (Manni et al., 2013).

The role of ESD is to indicate the differences among several groups in the society in order to offer opportunities to students to see the contradictions among the three dimensions in everyday life and in policy-making (Berglund and Gericke 2015; Sandell et. al. 2005). If we deal with each dimension one by one, the contradictions among the dimensions will not be obvious. However, we have to deal with the implications of the dimensions when we have to take decisions. In practice, we end up to set priorities among the implications of the dimensions (Berglund and Gerick 2015). Splitting SD into three dimensions implies that we could focus on one of these; this has its own advantages, though (Gough 2002; Giddings et al. 2002). Research supports the inclusion of both, conflict- and congruence/harmony perspectives in ESD teaching (Herremans and Reid 2002; Öhman and Öhman 2012 in Olsson et. al. 2015; Berglund and Gericke 2015).

The co-evolution of policy and ESD

ESD is a teaching subject constructed by policy-makers and academics applying top-down educational approaches (Gouth 2013). Consequently, it is abstract and its connection to teaching practice is vague to teachers since teachers themselves have not participated in the formation of its goals and concepts (Gouth 2013). Nonetheless, they are called on to put ESD teaching in practice. The fact that the discourse of ESD is under continuous evolution (Plant 1995), which we find to be in alignment with the evolutionary concept of SD, makes it even more difficult for teachers to follow, in the first place, and eventually put it into practice. However, the evolutionary character of ESD leaves room for teachers as to what, as Stevenson (2006) and Gough (2013) argues, is important in the ESD discourse, namely, the engagement of the teachers in the research process. The cooperation of all the

stakeholders in policy-making could provide a practice-oriented framework to help (a) to deal with the contradictions related to the SD concept as well as to move from EE to ESD (Stevenson 2006). Since SD is a political concept, ESD has to treat teachers and students as active participants attributing their own meanings to the SD concept.

The ESD policy coherence among several sections, such as education and SD section is one of UNESCO's concerns (UNESCO, 2013). The cooperation among several stakeholders across education and SD section (UNESCO, 2013) to put the new agenda (Agenda 2030) in practice, monitor and report on it (UNESCO, 2015) is suggested by UNESCO (2015). However, this requires ESD to take up new orientations. According to our view, towards this direction, the post-2015 agenda makes attempts to integrate ESD with other fields. First of all, ESD is referred to in Agenda 2030 in combination with quality education under goal 4, target 4.7. (UN 2015). Also, ESD is seen '*as an integral element of quality education*' (UNESCO, 2014b, p. 9). In addition to this, UNESCO (UNESCO, 2015) puts a great emphasis on its role '*to harness its multidisciplinary expertise and experience in its fields of competence towards the achievement of the SDGs* (p. 11). This leads us to conclude that in order to achieve SDGs, we have to consider other fields of competence towards SDGs rather than ESD alone. Another evidence for our claim is that the GAP (UNESCO 2014b) puts particular emphasis on the global aspects of SD linking ESD to global citizenship education (Ohman 2016). The emphasis given to viewing SD in a holistic, integrated and balanced way may have an impact on ESD but also on the educational sector in general, in the near future.

There is an ever greater emphasis in the latest international policy documents, among them, the final report of the DESD (UNESCO 2014a), the Agenda 2030 (UN 2015) and the GAP (UNESCO 2014b) on developing monitoring and evaluation techniques to assess the quality of ESD programmes and their learning outcomes. It is argued that, in this way, we could reveal evidence-based effective ESD techniques (UNESCO 2014b) to be taken into consideration when making ESD policy and finally, to narrow the gap between ESD policy and practice. Nonetheless, Sund (2015) expresses concerns that the recent trend towards national measurements may diminish the complexity of sustainability/SD issues.

Implications for ESD practice and research

Teachers have difficultie in helping students to acquire a correct understanding of the SD concept (Walshe 2008). However, teachers get little support to teach such a difficult concept (Walshe 2008). Their conceptions of the SD concept are translated into curriculum planning and teaching (Stevenson 2006; Birdsall 2014, 2015). Teachers often simplify sustainability issues in order to make them easier for the students to understand (Sund 2015), which threatens the cultivation of students' skills to reflect and evaluate contesting perspectives (Jickling 1994; Vare and Scott 2007). Thus, further teacher training in SD appears to be absolutely necessary (Borg et al. 2014). The following paragraphs explain what the main characteristics of teacher and student education should be.

Research in teacher professional development and ESD tends to see sustainability issues through EE lenses (Stables and Scott 2002). And this is reflected in the results of recent research regarding teachers' conceptions of the SD concept. In this case, an interdisciplinary approach in teaching ESD in the teacher training programmes could provide opportunities to teachers to see SD issues more holistically. The same goes for students. As Walshe (2016) argues, interdisciplinary teaching could help students to consider SD issues from plural perspectives, which, in turn, according to Jickling (2003), enables them to develop their own views about sustainability (Walshe 2016). A holistic approach to SD is often ignored in teaching practice. A traditional normative EE approach is implemented rather than an ESD oriented one (Borg et al. 2012; Olsson et. al. 2015; Boeve-de Pauw et al. 2015; Olsson Gericke 2016). However, the SD issues are difficult to address by using a traditional normative EE approach, whereas an ESD approach aiming at cultivating students' action competence (see Vare and Scott 2007) is needed (Boeve-de Pauw et al. 2015; Olsson and Gericke 2016). While these findings refer to school education, this may be the case in teacher education, as well. Indeed, a recent study found evidence that academics in the field of ESD who teach trainee teachers do not apply innovative teaching approaches to ESD (Sinakou, Boeve-de Pauw and Van Petegem 2016). Then it becomes quite clear that the concept should be approached differently, namely from an ESD perspective, which gives the opportunity to trainee students to approach the SD concept holistically.

Back in 2006, Stevenson argued that '*illustrative examples'* or '*case histories'* (p. 279), which could provide materials to support teaching, were missing. We argue that ESER (Environmental and Sustainability Education Research) should look for effective practices rather than focusing alone on barriers that diminish the potential of ESD. Thus, other teachers also get inspired. Smyth (1995) acknowledges that it is of high significance that teachers establish their own understanding of the concept through dialogue, reflection and critical inquiry. Workshops based on this approach would encourage in-service teachers, who are often reluctant to get engaged with the academic literature on ESD. The tools developed by Birdsall (2014) could be used in this case. Birdsall (2014) developed two tools to help teachers to get a broader understanding of the sustainability concept through taking into consideration various aspects and their interconnections, reflecting on their understanding and thus becoming aware of the concept and assess it. These tools could also be used in classroom to assess students' understanding of the concept.

Martin (2012) suggests that teachers need to raise their own awareness of critical theories to use as a lens to see global and sustainability issues so as to get a deeper understanding of them (Sund, 2016). Teacher training should inspire them to consider how issues of power in the course of the last centuries as well as different kinds of knowledge form how people see the world (Martin 2011; Pashby 2012). Moreover, teacher should encourage students to critically address the relationships between humans and nature (Spannring, 2017). Students need to approach their views about other species by analyzing them on the basis of several political, cultural as well as ideologies perspectives (Spannring, 2017). A pluralistic ESD approach leaves room

for the ‘voices’ of other species, future human generations (Kopnina, 2012a, 2014), as well as current marginalized groups of people. Such as an approach regards the SD issues as complicated issues with ethical as well as political perspectives allowing conflicting interests to unravel (Andersson, 2016).

Further research should examine whether teacher training programmes help trainee and in-service teachers to develop a holistic idea of the SD concept. The curricula entail messages about the meaning of the SD concept and, therefore, they are expected to influence teachers’ conceptions. Last but not least, teaching material like ICT sources, textbooks or children’s literature should convey similar messages, as well. It would be interesting to identify how the aforementioned factors influence teachers and students.

References

Andersson, K. (2008). *Transparency and Accountability in Science and Politics – the Awareness Principle*. UK: Palgrave Macmillan.

Andersson, K. (2016). Starting the pluralistic tradition of teaching? Effects of education for sustainable development (ESD) on pre-service teachers' views on teaching about sustainable development, *Environmental Education Research*, doi:10.1080/13504622.2016.1174982

Bartlett, A. (2012). Reflections on Sustainability and Population Growth. In P. Cafaro & E. Crist (eds), *Life on the Brink: Environmentalists confront Overpopulation*. pp. 29-40, Atlanta: University of Georgia Press.

Berglund, T., Gericke, N. & Chang Rundgren, S.-N. (2014). The Implementation of Education for Sustainable Development in Sweden: Investigating the Sustainability Consciousness among Upper Secondary Students. *Research in Science & Technological Education*, 32(3), 318–339. doi: 10.1080/02635143.2014.94443.

Berglund, T., & Gericke, N. (2015). Separated and integrated perspectives on environmental, economic, and social dimensions – an investigation of student views on sustainable development, *Environmental Education Research*, doi:10.1080/13504622.2015.1063589.

Birdsall, S. (2014). Measuring student teachers' understandings and self-awareness of sustainability, *Environmental Education Research*, 20(6), 814-835.

Birdsall, S. (2015). Analysing teachers' translation of sustainability using a PCK framework, *Environmental Education Research*, 21(5), 753-776.

Boeve-de Pauw, J., Gericke, N, Olsson, D. & Berglund, T. (2015). The Effectiveness of Education for Sustainable Development. *Sustainability*, 7, 15693-15717.

Bonnett, M. (1999). Education for Sustainable Development: A Coherent Philosophy for Environmental Education?. *Cambridge Journal of Education*, 29(3), 313–324.

Bonnett, M. (2002) Education for sustainability as a frame of mind, *Environmental Education Research*, 8(1), 9–20.

Bonnett, M. (2007). Environmental Education and the Issue of Nature. *Journal of Curriculum Studies*, 39, 707–721.

Borg, C., Gericke, N., Höglund, H. O. & Bergman, E. (2012). The Barriers Encountered by Teachers Implementing Education for Sustainable Development: Discipline Bound Differences and Teaching Traditions. *Research in Science and Technological Education*, 30(2), 185–207.

Borg, C., Gericke, N., Höglund, H. O. & Bergman, E. (2014). Subject- and Experience-bound Differences in Teachers' Conceptual Understanding of Sustainable Development. *Environmental Education Research*. 20(4), 526–551.

Corcoran, P.B. & Wals, A.E.J. (eds.) (2004). *Higher Education and the challenge of sustainability*. Dordrecht: Kluwer.

Corney, G. (2006). Education for Sustainable Development: An Empirical Study of the Tensions and Challenges Faced by Geography Student Teachers. *International*

Research in Geographical and Environmental Education, 15(3), 224–240.
Corney, G. & Reid, A. (2007) Student teachers' learning about subject matter and pedagogy in education for sustainable development, *Environmental Education Research*, 13(1), 33-54.
Crist, Eileen (2008). Against the social construction of nature and wilderness. In M. Nelson and J. B. Callicott (eds). *The Wilderness Debate Rages On*, Volume II, pp. 500-525, University of Georgia Press.
Evans, N. (2010) *Social-ecological resilience through education for sustainability: a case study of community scale resilience*. PhD thesis, James Cook University.
Giddings, B., Hopwood, B. & O'Brien, G. (2002). Environment, Economy and Society: Fitting Them Together into Sustainable Development. *Sustainable Development*. 10(4), 187–196.
Gough, A. (1997) *Education and the environment: policy, trends and the problem of marginalization*. Melbourne: Australian Council for Educational Research.
Gough, A. (2013). The emergence of environmental education research: A "history" of the field. In R. B. Stevenson, M. Brody, Justin Dillon, A. E.J. Wals (ed.) *International Handbook of Research on Environmental Education*, pp. 13-22, N.Y.: Routledge.
Gough, S. (2002). Increasing the Value of the Environment: A 'real Options' Metaphor for Learning. Environmental Education Research, 8(1), 61–72.
Hansen, A. & Wethal, U. (2014). *Emerging economies and challenges to sustainability: Theories, strategies, local realities*. New York, NY, USA: Routledge.
Herremans, I. M. & R. E. Reid. (2002). Developing Awareness of the Sustainability Concept. *The Journal of Environmental Education*, 34(1), 16–20.
Hopwood, W., Mellor, M. & O'Brien, G. (2005). Sustainable development: mapping different approaches. *Sustainable Development*, 13, 38-52.
Jabareen, Y. (2008). A New Conceptual Framework for Sustainable Development. *Environment, Development and Sustainability*, 10, 179–192.
Jickling, B. (1994). Why I don't want my children to be educated for sustainable development: Sustainable belief. Trumpeter, 11(3), 1-8.
Jickling, B. (2003). Environmental Education and Environmental Advocacy: Revisited. *The Journal of Environmental Education*, 34(2), 20–27.
Jickling, B., & Wals, A. E. J. (2008). Globalization and Environmental Education: Looking Beyond Sustainable Development. *Journal of Curriculum Studies*, 40(1), 1–21.
Kilinc, A., & Aydin, A. (2013). Turkish student science teachers' conceptions of sustainable development: A phenomenography. *International Journal of Science Education*, 35(5), 1–22.
Kopnina, H. (2012a). Education for Sustainable Development (ESD): The Turn Away from 'Environment' in Environmental Education?, *Environmental Education Research*, 18:5, 699- 717.

Kopnina, H. (2014). ‘Contesting ‘Environment’ Through the Lens of Sustainability, *Culture Unbound*, 6, 931–947.

Lotz-Sisitka, H. (2009). “How Many Declarations Do We Need?” Inside the Drafting of the Bonn Declaration on Education for Sustainable Development*.” Journal of Education for Sustainable Development*, 3(2), 205–210.

Manni, A., Sporre, K. & Ottander, C. (2013). Mapping What Young Students Understand and Value regarding the Issue of Sustainable Development. *International Electronic Journal of Environmental Education*, 3(1), 17–34.

Martin, F. 2011. Global Ethics, Sustainability and Partnership. In G. Butt (ed). *Geography, Education and the Future*, pp. 206–224, London: Continuum.

Martin, F. (2012). The Geographies of Difference. *Geography*, 97(3), 116–122.

McKeown, R. & Hopkins, C. (2003). EE ≠ ESD: Defusing the worry. *Environmental Education Research*, 9 (1), 117–128.

Newman, L. (2006) Change, Uncertainty, and Futures of Sustainable Development, *Futures*, 38, 633-7.

Öhman, M., & Öhman, J. (2012). Harmoni Eller Konflikt? En Fallstudie Av Meningsin- nehållet I Utbildning För Hållbar Utveckling. [Harmony or Conflict? A Case Study of the Conceptual Meaning of Education for Sustainable Development]. *Nordic Studies in Science Education,* 8(1): 59–72.

Öhman, J. (2016). New Ethical Challenges within Environmental and Sustainability Education. Environmental Education Research. 22(6), 765-770.

Olsson. D, Gericke. N, & Chang Rundgren. S. -N. (2015). The effect of implementation of education for sustainable development in Swedish compulsory schools – assessing pupils’ sustainability consciousness, *Environmental Education Research,* doi:10.1080/13504622.2015.1005057.

Olsson, D. & Gericke, N. (2016). The Adolescent Dip in Students’ Sustainability consciousness – implications for Education for Sustainable Development. *The Journal of Environmental Education,* 47(1), 35–51.

Pashby, K. (2012). Questions for Global Citizenship Education in the Context of the ‘New Imperialism’. In V. de Oliveira Andreotti and L. M. TM. de Souza (eds). *Postcolonial Perspectives on Global Citizenship Education*, pp. 9–26. New York: Routledge.

Plant, M. (1995) The riddle of sustainable development and the role of environmental education, *Environmental Education Research,* 1(3), 253–266.

Rees, W. (1992), Understanding sustainable development. In B. Hamm, G. Zimmer, and S. Kratz, (eds), *Sustainable Development and the Future of Cities*, Proceedings of an International Summer Seminar, Bauhaus, Dessau, 7-14 September 1991, pp. 17-40.

Rees, W. (2010). What’s blocking sustainability? Human nature, cognition, and denial. *Sustainability: Science, Practice & Policy,* 6(2), 13–25.

Roorda, N. (2010). *Sailing on the winds of change: The Odyssey to Sustainability of*

the Universities of Applied Sciences in the Netherlands. Phd thesis, Maastricht University.

Sandell, K., Öhman, J., Östman, L., Billingham, R. & Lindman, M. (2005). *Education for Sustainable Development: Nature, School and Democracy*. Lund: Studentlitteratur.

Scott, W. A. H. & Gough, S. (2003). *Sustainable development and learning: framing the issues*. London: Routledge/Falmer.

Sinakou, E., Boeve-de Pauw, J., & Van Petegem, P. (2016). *Academic staffs' conceptions of sustainable development in education.* Paper presented in ECER, leading education: The distinct contributions of educational research and researchers, Dublin, 22-26 August 2016.

Smyth, J. C. (1995) Environment and education: a view of a changing scene, *Environmental Education Research*, 1(1), 3–20.

Spannring, R. (2017). Animals in environmental education research, *Environmental Education Research*, 23(1), 63-74.

Spiropoulou, D., Antonakaki, T., Kontaxaki, S. & Bouras, S. (2007). Primary Teachers' Literacy and Attitudes on Education for Sustainable Development, *Journal of Science and Educational Technology*, 16 (5), 443-450.

Stables, A. & Scott, W. (2002) The quest for holism in education for sustainable development, *Environmental Education Research*, 8(1), 53–61.

Stevenson, B. R. (2006). Tensions and transitions in policy discourse: recontextualizing a decontextualized EE/ESD debate, *Environmental Education Research*, 12(3-4), 277-290.

Summers, M., Corney, G. & Childs, A. (2004) Student teachers' conceptions of sustainable development: the starting-points of geographers and scientists, *Educational* Research, 46(2), 163–182.

Summers, M., & Childs, A. (2007). Student Science Teachers' Conceptions of Sustainable Development: An Empirical Study of Three Postgraduate Training Cohorts. *Research in Science & Technological Education*, 25(3), 307–327.

Sund, P. (2015). Experienced ESD-Schoolteachers' Teaching – An Issue of Complexity. *Environmental Education Research*, 21(1), 24–44.

Sund, L. (2016). Facing global sustainability issues: teachers' experiences of their own practices in environmental and sustainability education, *Environmental Education Research*, 22(6), 788-805.

UN (1992). *Results of the World Conference on Environment and Development: Agenda 21*. UNCED United Nations Conference on Environment and Development, Rio de Janeiro, United Nations, New York. 3-4 June 1992.

UN. (2002). *Johannesburg declaration on sustainable development. From our origins to the future*. Report on the world summit on sustainable development, 26 August–4 September 2002. Johannesburg, South Africa.

UN (2015): *Transforming our world: The 2030 Agenda for Sustainable Development*, New York, 12 August 2015.

UNESCO. (1997). *Thessaloniki Declaration*. International conference on environment and

society: education and public awareness for sustainability, 8–12 December. Thessaloniki, Greece.

UNESCO (2006). United Nations Decade of Education for Sustainable Development 2005–2014, UNESCO: International Implementation Scheme. Paris: UNESCO.

UNESCO (2013). *Global Action Programme on Education for Sustainable Development as follow-up to the United Nations Decade of Education for Sustainable Development after 2014* (37 C/Resolution 12).

UNESCO (2014a). *Shaping the Future We Want. UN Decade of Escuation for Sustainable Development (2005-2014). Final report*. Paris: UNESCO.

UNESCO (2014b). *Roadmap for implementing the Global Action Programme in Education for Sustainable Development*. Paris: UNESCO.

UNESCO (2015) *Preparation of the Draft Programme and Budget for 2018-2021* (39 C/Resolution 5).

Van Asselt, M., & Rijkens-Klomp, N. (2002). A look in the mirror: Reflection on participation in integrated assessment from a methodological perspective. *Global Environmental Change: Human and Policy Dimensions*, 12(3), 167–184.

Van Weelie, D. & Wals A.E.J. (2002): Making biodiversity meaningful through environmental education. *International Journal of Science Education,* 24(11), 1143 – 1156.

Vare P & Scott W. A. H., (2007) Learning for a Change: exploring the relationship between education and sustainable development. *Journal of Education for Sustainable Development*, 1(2), 191–198.

Walshe, N. (2008). Understanding Students' Conceptions of Sustainability. *Environmental Education Research*, 14(5), 537–558.

Walshe, N. (2013). Exploring and Developing Student Understandings of Sustainable Development. *The Curriculum Journal*, 24 (2), 224–249.

Walshe, N. (2016). An interdisciplinary approach to environmental and sustainability education: developing geography students' understandings of sustainable development using poetry, *Environmental Education Research*, doi:10.1080/13504622.2016.1221887.

Washington, H. (2015) *Demystifying sustainability: Towards real solutions*. London, UK: Routledge.

Wuelser, G., Pohl, C., Hirsch Hadorn, G. (2012). Structuring complexity for tailoring research contribution to sustainable development: a framework. *Sustainability Science*, 7(1), 81–93.