CHAPTER 8

Theorising Active Learning – A Historical Analysis

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Introduction

There is no definitive or consensual Education for Sustainable Development (ESD) pedagogy but there is a suite of techniques which, if examined, will reveal similar features and principles. For example, in its ESD sourcebook, Unesco (2012) highlights pedagogies featuring question-orientated, analytical, critical and decisive skills, as well as relational pedagogies with features such as learner-centredness and participation. In its later Roadmap for Implementing the Global Action Programme for Education for Sustainable Development, Unesco calls for pedagogies that support the designing of ‘teaching and learning in an interactive, learner-centred way that enables exploratory, action-oriented and transformative learning’ (Unesco 2014: 12). An international collaborative group – ESD Expert-Net – highlighted the ‘active’ element of ESD arguing that ‘action’ or ‘doing’ elements of learning have traditionally been neglected, and that if ESD practice is to address local and global challenges ‘a strong action component’ is needed (Hoffmann & Rajeswari n.d.: 9). The notion of ‘active learning’ has been of central interest in the Fundisa for Change project. This chapter describes its trajectory of development and use in South African ESD by outlining core features and principles for active learning. This is with a view to positioning the further chapters in this section of the book in relation to national and international research that has influenced the approach of Fundisa for Change. The chapter also serves to inform international interests in active learning.

The term ‘active learning’ is used, but not explicitly elaborated, in formal South African curriculum documentation. In official South African policy discourse, the first post-apartheid reference to active learning in education can be found in the 1995 White Paper on Education and Training which called for ‘environmental education involving an interdisciplinary and active approach to learning’ (South Africa DoE 1995: 11). The same notion has been incorporated into the three iterations of post-apartheid curricula up to the current South African Curriculum and Assessment Policy Statement (CAPS), which calls for ‘encouraging an active and critical approach to learning, rather than rote and uncritical learning of given truths’ (South Africa DBE 2011: 3). However, none of these policy documents have elaborated on what active learning means, and what teaching and learning processes might support it. Therefore, at the level of educational practice, much is left up to interpretation by curriculum implementers and teacher training institutions.

At issue in this chapter is a deeper theorising and understanding of active learning. This is achieved through two processes. The first is elaboration of the three emergent core features of active learning, as introduced above, through reference to influential national and international educational and ESD literature in South Africa since 1994. Second, the chapter seeks to elaborate further on active learning by drawing on a critical realist dialectic, which sees ‘active and reflexive engagement within the world in which we seek to achieve the unity of theory and practice *in practice*’ (Bhaskar 1993) as the culmination of dialectical thinking, and where agency is elaborated as ‘embodied intentional causal absencing’ (Bhaskar 1993).

A key influence in the implementation of active learning processes in South Africa was an active learning framework developed by O’Donoghue (2001) which played a significant role in supporting teachers through the design of environmentally focused learning units. The artist’s rendition of active learning reproduced in Figure 1 below evokes the complexity of how the idea was taken up by ESD practitioners at the time.

Figure 1. Artist Richard Kilpert’s rendition of active learning (2000)

O'Donoghue's framework (elaborated in the next section) structures information-based enquiry, action and reporting/reflection activities around a central environmental focus (problem, risk or concern). The use of this framework in teacher professional development programmes dates back to the National Environmental Education Programme for General Education and Training (NEEP-GET). This was piloted in South Africa in 2000 (Schudel et al. 2000) in the Eco-Schools programme, where it was used for guiding lesson planning (Rosenberg 2000) and in teacher education courses developed, for example, by Rhodes University in the Schools and Sustainability Course (Schudel et al. 2008a). Modifications of the same framework have been used in the national Fundisa for Change environmental education programme for teachers and teacher educators (O'Donoghue 2013; O'Donoghue 2019). The 2019 version is also discussed in the section that follows.

The active learning framework is designed as a structure for guiding learning programmes but can be used in many different ways depending on how its users see and understand its purpose, and how they experience its implementation in the field. This chapter first describes the earliest and latest (2019) framework versions in detail, followed by a clarification and critique of implicit and espoused theories, intentions and assumptions associated with the notion of active learning. This is achieved by a document review across numerous research reports which provide insight into how ESD research, both internationally and in South Africa, has influenced the development and interpretation of the notion. This part of the chapter results in the elaboration of three core features of active learning as a situated, action-orientated and reflexively deliberative pedagogy. In the final section of the chapter, a number of principles relevant to each of the core features is lifted from the analysis to suggest ways for strengthening the capacity of active learning processes to enable transformative learning in ESD.

An evolving active learning pedagogy

O'Donoghue indicated that active learning emerged at a time in South Africa when concern for 'local enquiry, problem solving and action learning' were recognised as important pedagogical processes (O'Donoghue 2007: 150). This was a time when environmental educators were recognising that environmental education was more than simply transmitting information about problems, or experiences, to raise awareness of the value of nature. Exploring human-environment relationships and alternative practices in the context of learners' own lives was necessary to help them deal with the everyday reality of environmental risks and concerns (O'Donoghue 2007). The importance of tackling concerns in everyday contexts is also evident in Janse van Rensburg's Guidelines for Learning Area Working Groups produced for the NEEP-GET to guide South African curriculum development. Here she called for 'active learning, critical thinking, involvement in real issues and encounters in the learners' immediate environment' (Janse van Rensburg 2001: 30).

This section provides an overview of the structure of the active learning framework as proposed by O'Donoghue (2001: 8) (see Figure 2). O'Donoghue's open process

framework suggests the identification of an environmental focus (which may be a problem, concern or risk) and then draws attention to four different types of activities that can be used to structure environmental learning programmes around this focus. These are listed below and elaborated through my own understanding and experience of their implementation in the Schools and Sustainability Course:

- **Information-seeking activities:** Learners find out what is already known about the environmental focus (informal research). They identify what else they need to find out (know) and uncover that information (with help from the teacher), through the use of information resources and 'expert' knowledge from institutions and individuals in the local community. Types of information might include foundational environmental knowledge of ecological principles and systems; scientific (natural science or social science) information about an issue or practice; a technological design to support a particular practice; or information on an ethical standpoint regarding a particular issue.
- **Enquiry encounters:** Learners investigate the focus further (through investigations in local surroundings gathering qualitative and quantitative data through methods such as interviews, audits, surveys, observations and field studies) in order to explore how the environmental issue, risk or concern is being experienced in their community. In the course, this was used to help 'learners to monitor, analyse, and evaluate [a] situation, resource or activity, and then plan to take appropriate action' (Schudel et al. 2008b: 2).
- **Action taking:** Learners act to make 'a conscious and informed response' to an issue/concern/risk raised in the course or '[try] out ways of doing things differently' (O'Donoghue et al. 2007: 141). Schudel et al. (2008c) explained that action does not necessarily have to be a practical hands-on activity, but can also involve planning for action, or lobbying for authorities to take action.
- **Reporting:** Learners reflect on the other dimensions of the framework. The act of reporting brings opportunities for critical reflection, especially around O'Donoghue's suggested 'steering question' of 'What do we now know and what have we achieved towards sustaining alternatives?' (2001: 10).

O'Donoghue (2001: 7) saw his proposed framework as supporting 'open-ended processes of active learning' and suggested that educators could take any one of the dimensions as a starting point and superimpose appropriate methods within the different dimensions of the framework to create a 'multi-skilled and multi-perspective approach to environmental risks and concerns'. For example, activities initiated by O'Donoghue (2011) in the Environmental Learning Research Centre, suggest possibilities for starting with an **action** of making sour-dough bread, followed with

information about how the souring process breaks down gluten (thus addressing the problem of gluten allergies), followed by an **enquiry** regarding the ingredients, costs and taste of homemade versus shop-bought bread, and **reporting** on the differences between the two types of bread.

Figure 2. Active learning framework (O'Donoghue 2001)

O'Donoghue (2001) drew on Fien's (1993) concepts of education *about*, *through* and *for* the environment to inform the active learning framework. Fien described education *about* the environment as 'knowledge about natural systems and processes and the ecological and political factors that influence decisions about how people use the environment' (1993: 15). This concept clearly links with the 'information' dimension of the active learning framework. Education *through* the environment has the purpose of adding 'reality, relevance and practical experience' to learning (1993: 15), and this has links to the experiential nature of the 'enquiry encounters' dimension of active learning, the 'mobilising of prior knowledge' which is important to the 'information' dimension, and the hands-on and minds-on nature of responding to, or action-taking in, a real context. Fien (1993: 16) describes education *for* the environment as a 'counter-hegemonic process' and having 'an overt agenda of values education and social change'. Possibilities for this counter-hegemonic stance are opened up by O'Donoghue's (2001: 7) call for 'critical action', for trying out ways of doing things differently (see action-

taking dimension above), and for making explicit the transformational possibilities embedded in the framework.

In 2019 O'Donoghue revised this framework for active learning for the Fundisa for Change programme where it was used as a core text for the training of South African curriculum advisors and teachers. The basic skeleton of the revised framework is presented in Figure 3, and elaborated in O'Donoghue, Misser and Snow-McLeod's chapter later on in this book (Chapter 10). For the purposes of this chapter, I will work with this 'skeleton' in order to highlight its similarities to the 2001 framework, and also to point out key changes made in response to the current South African curriculum needs.

First, one can see that the core interests in information (now in an embodied notion of 'knowledge'), inquiry, action and reporting (synthesis) are still evident. Similar to the 2011 framework's interest in making better environmental management and lifestyle choices, the current framework insists on application and innovation. How this new framework differs significantly as a response to the current South African needs, is in specifically highlighting the importance of subject-discipline knowledge in Quadrant 1. The framework also emphasises assessment more strongly by focusing on what learners ought to achieve through the active learning process. The New Bloom's Taxonomy, as revised by Krathwohl (2002) is evident in the framework, which highlights lower order (knowing and remembering), medium order (understanding and applying), and higher order (analysis, evaluation and innovation) cognitive skills. Innovation is particularly important for environmental learning, which is aimed at transforming the world, and this links to Krathwohl's cognitive level of 'create' which he described as 'putting elements together to form a novel, coherent whole or make an original product' (2002: 215). The historical significance of these moves will be highlighted in the discussion of active learning below.

Figure 3. Mediating and assessing active learning (O'Donoghue 2019)

Methodology

The study represents part of a more extensive doctoral study on active learning (Schudel 2013). This chapter was established through a historical document review of research reports, project guidelines and course materials of the four national South African programmes that have contributed to the conceptualisation, and guided implementation of, active learning in the country since 1994. These programmes are: the Learning for Sustainability Course; the NEEP-GET Programme; the Eco-Schools Programme; and the Schools and Sustainability Course (see Schudel, Lotz-Sisitka, Songqwaru and Tshiningayamwe, Chapter 1 for insight into the role of some of these programmes). These are all programmes in which leading implementers of Fundisa for Change have participated, and which provide experience from which South African environmental educators are able to draw. Appendix A presents a log of the documents included in the review. The final document in the list is the doctoral study mentioned above. While this document has not been referred to directly in this chapter, a number of references to a critical realist dialectic, which were developed in the doctoral thesis, have been brought forward to deepen understandings of active learning in this chapter. Three core features of active learning emerged from the review. This shows that in South Africa, active learning has emerged as a situated, action-orientated, and reflexively deliberative pedagogy. In the next section, key pointers pertinent to this conceptualisation of active learning have been presented and elaborated on, with reference to literature that helps to position the pedagogical choices made iteratively across the four programmes.

The pedagogical underpinnings of active learning in South African ESD research

Active learning as situated

Reflecting on the NEEP-GET programme, Lotz-Sisitka and O'Donoghue argued that in the South Africa of the time, 'current patterns of practice in participatory education favour individualised meaning-making approaches that are disembedded from the realities of everyday life' (2008: 124). Participation as a pedagogical argument has been driven by post-apartheid South Africa's democratic ideals, and constructivist pedagogies and literature suggest that this concept requires situated grounding. Lotz-Sisitka and O'Donoghue (2008) noted that participation can become 'increasingly tenuous and self-referential' (p. 111). This, they argued, was evident in curriculum processes emphasising 'cooperative activity, solidarity, and apparent movement [which] have created an illusion of change' (p. 112). The critique they presented in this paper is followed by illustrative cases of ESD processes which are more grounded in socio-cultural and historical contexts. Their argument for such pedagogy emerged from a previous paper where they illustrated how 'situating in southern African socio-cultural context and history involves the interplay of real stories in context and the stories of what participants experience, do and know (situating story activities) in the contexts of

intergenerational and everyday interactions' (O'Donoghue & Lotz-Sisitka 2006: 13).

Furthermore, ungrounded participatory processes can result in utopianist or reified applications of environmental learning (Jickling 1992; Lotz-Sisitka 2008). It then becomes necessary to examine the shaping influences and practical adequacy of normative frameworks (Lotz-Sisitka & Schudel 2006). Smyth (1995) raised a concern that the complexity of the issues often results in over-simplification of, and hasty judgements about, environmental issues – thus giving rise to solutions reflecting idealistic responses to negativity. This idealism results in learners having to deal with 'real contradictions in the world' (Norrie 2000: 60), but without the power to change them.

In order to gain insight into this dilemma, dialectical critical realism can offer some insight and ontological grounding by using Bhaskar's notion of concrete utopianism, to enable 'thinking about how a situation of the world could be otherwise, with a change in the use of a given set of resources or with a different way of acting subject to certain constraints' (Bhaskar 1993: 22). Concrete utopianism can be a useful concept that ensures that generalised, idealistic and unrealistic ideas are not imposed inappropriately on specific contexts. Furthermore, linked to the active learning interest in innovation, Bhaskar describes concrete utopianism as playing a 'role of creative fantasy ... that yields at once hope and possibility' (1993: 209).

The grounding of situated understanding in intergenerational learning, as noted in the first paragraph of this section, has received much attention in South African ESD debates. For example Maqwelane – a participant in the Schools and Sustainability Course – examined how indigenous knowledge of wild vegetables (*imifino*) was integrated into the primary school curriculum by inviting wise grandmothers (*gogos*) to share their knowledge about the health and ecologically friendly benefits of *imifino* with younger learners (Maqwelane 2011). The close connection between intergenerational knowledge and indigenous knowledge is significant here and is also a response to the concern about individualised meaning-making mentioned above. Knowledgeable and experienced generations are a significant dynamo in mobilising 'unique [African] histories of knowledge practices that have sustained its peoples over many generations of living in, and creating, habitable landscapes' (O'Donoghue et al. 2019).

The focus on 'local experience' and the 'everyday' link closely and often overlap with the vision of including more intergenerational and indigenous knowledge in curricula. For example, the Eastern Cape Province NEEP-GET project modelled environmental learning practices using issues and risks identified in photographs of local context and newspaper articles. These local examples were used in an issues-based approach to environmental learning in which issues and risks in context were the main emphasis (NEEP-GET 2005). This issues-based approach resonated well with the requirement for competency in 'knowledge and understanding of local environmental issues and risks' which became one of the key competencies for teacher education highlighted by the NEEP-GET (Lotz-Sisitka & Raven 2001). The issues-based approach has been expanded in South African ESD discourse to include a 'practice' element, as illustrated by further research in the NEEP-GET which noted an interest in 'practice-based

discourse strongly focused on local, real issues' (Ramsarup 2005). This shift in practice as described by Taylor (2009) is not only about highlighting generalised problems in the world but about understanding the 'problem in context' (O'Donoghue 2014: 10).

Despite the above-mentioned interest in local and everyday experiences, learning does not and cannot be limited to knowledge of everyday contexts. We need to understand the fluidity of the notion of 'local': are we talking locally rural, or locally urban, locally indigenous, locally provincial, locally South African, locally African, or locally global south, for example? How local is 'local'? Even within a national programme in a country as diverse as South Africa, 'local plants' can be very different in different places. Also important to acknowledge is that we are all global citizens, so contextualised materials need to present global understandings with activities for developing embedded, not disconnected, local understandings. As stated in the 'Eco-Schools Handbook', 'most environmental issues have both a local and a global dimension' (Eco-Schools Programme South Africa 2009: 18).

For example, in their 'Handprint: Action Towards Sustainability' series, O'Donoghue and Fox (2009) illustrated an iterative relationship between knowledge and practice through the use of case studies of local learning (knowledge construction in communities of practice) and change (the trying out of sustainability practices) in real contexts. This allowed them to develop a series of resource books 'around locally relevant knowledge resources and practical learning activities' (p. 1) which are situated in the context of global environmental change. For example, one of the books on carbon sequestration supported the planting of an indigenous succulent – 'spekboom'. This plant has a high capacity to absorb carbon – thus enabling the regeneration of indigenous biomes at a local level while responding to the global climate change concern.

Finally, because the notion of situatedness plays into the next core feature of active learning – its action-orientated nature – another important insight into situatedness can be added from dialectical critical realism: that is, the notion of absence which brings additional opportunity to the language of possibility described above. Sayer (2000: 12) explained that a critical realist ontology 'makes it possible to understand how we could be or become many things which currently we are not'. Even in cases where potential powers of societal structures and mechanisms are exercised, tendencies exerted by other structures and mechanisms may counteract or reinforce these powers.

Thus, the work of dialectical realism becomes consistent with the transformative intent of ESD as we need a process of 'absenting absence' (Bhaskar 1993: 176). By negating absence (also a part of concrete utopianism as described above) Bhaskar stresses that we need to 'pinpoint the real, but non-actualised possibilities inherent in a situation, thus inspiring grounded hope to inform emancipatory praxis' (1998: 215).

Active learning as action-orientated

An important historical influence on the notion of active learning in South Africa has been the action competence approach – a concept originating among Danish authors working in the health sector and introduced to South African educators through Danish

involvement in national environmental education programmes, such as the Learning for Sustainability Project and the NEEP-GET in the late 1990s (Janse van Rensburg 2001; O'Donoghue 2007). Action competence has helped with giving meaning to the notion of active learning in that the 'action-orientation' of active learning in the field of environmental learning can create misunderstandings if the change-orientated element becomes displaced. For example, research in the NEEP-GET reported that 'there appeared to be some confusion between notions of action and activities, reflected for example in collecting leaves or making objects as forms of "action taking"' (Raven et al. 2005: 48). Jensen and Schnack (1997: 165) described competence as 'being able, and willing, to be a qualified participant' while action they saw as distinct from activity in that action is 'conscious, considered and targeted' at an environmental issue. Action-taking thus differs from activity in that it involves a conscious and informed response to an issue, problem or something that has been learned. An activity is simply a task done for the sake of doing or learning something. Environmental 'action' moves us towards environmental improvement and an improved quality of life.

An action competence approach is consistent with education *for* the environment as described in the section above, and is illustrative of the transformative intent behind the active learning framework. Another way of emphasising the transformational intent of social learning is 'a shift or switch to a new way of being and seeing' (Wals 2009). With this transformative intent, it is possible to conceive of the active learning framework being used in a behaviourist way that, ironically, might be counter to its intention as an alternative to authoritarian and top-down or instrumentalist approaches to environmental learning (O'Donoghue 2007). This possibility is backed by previous research in the Schools and Sustainability Course, where Hoffmann noted that: 'It seems that behaviourist assumptions and intentions can easily be camouflaged within techniques borrowed from popular contemporary theories such as the active learning framework' (2005). This implies that the active learning framework, with an intention for positive and empowering change, could paradoxically be re-interpreted to endorse oppressive and top-down relationships, for example, mandated litter clean-ups or other regimented activities in schools.

As with situated learning, education *for* the environment also needs to take care not to over-individualise the need for change. While individual behaviour changes can make a difference in the world, Jensen and Schnack (1997) insist that environmental problems are not only solved by decisions made by individuals but by addressing systemic structures of society. Similarly, Wals calls for a 'systemic and reflexive way of thinking and acting with the realisation that our world is one of continuous change and ever-present uncertainty' (2007a: 37). Critical realism stretches this notion even further by insisting that an understanding of agency requires an understanding of the relationship between these structures in society and the agents acting in it. Bhaskar uses the notions of 'positions (places, functions, rules, tasks, duties, rights, etc.) ... and practices (activities, etc.) as a system of mediating concepts representing a "point of contact" between human agency and social structures' (Bhaskar 1979: 51). This means that instead of focusing either on the individual or on societal structures, the critical

point of intervention in environmental change is the relationship between structure and agency.

Education *for* the environment also requires cognisance of power relations among the deliberators. Education *for* the environment has helped to place, and keep, the political dimension of issues on the environmental education agenda, thus illuminating the socially critical agenda of ESD and helping to give life to the field in the face of conservative influences (Jickling & Spork 1998). A pertinent question is whose knowledge dominates in the active learning process of ‘sharing’, ‘reporting’ and ‘mediation’ (O’Donoghue 2001). Reflection on democratic processes can be of use here. In its handbook, the national Eco-Schools Programme explained the intention that ‘as a democratic and participatory programme, pupils and staff experience active citizenship in school which encourages them to take ongoing, important roles in improving both their school and home environment’ (Eco-Schools Programme South Africa 2009: 2). Wals and Jickling (2009: 80) make a distinction between ‘shallow’ democracy which is ‘superficial, obligatory, detached, cosmetic, and strategic’, and ‘deep’ democracy that is ‘real, intrinsic, involved, genuine, and meaningful’. Wals argues for co-creation and co-ownership of ‘contextual solutions’ with the understanding that ‘forcing consensus on how people should live their lives is undesirable from a deep democracy perspective’ (2007b: 43).

In South Africa, co-engagement was supported, in particular, through an Eco-Schools process that led to the development of eco-committees in schools, which encouraged ‘community involvement’ along with ‘whole school development and democratic management’. Eco-committee members were involved in whole school audits at the beginning of each year, and in reviews at the end of a co-engaged policy development and implementation process (Rosenberg 2009: 22). Whole school development ‘integrates the formal curriculum, social/organisational aspects, institutional practices, evaluation and community links’ (Shallcross & Wals 2004: 1).

Jickling and Spork argue that: ‘If we are serious about education, we should, in the first place, put aside our most promising visions for the future. Moreover, if we really want to open students’ minds to alternative world views, it makes little sense to steer them, however gently, towards a particular vision’ (Jickling & Spork 1998: 342). This highlights the importance of transformation not being imposed by an outsider or presented as a pre-determined doctrine, thus ‘militating against the evolutionary tendencies of environmental thought’ (p. 323). The deep democracy perspective is a reaction against actions being driven by ‘outside’ concerns, that is, an imposed, decontextualised, ‘outsider’ view of what we should do.

Active learning as reflexively deliberative

O’Donoghue described the broadening of environmental learning processes in South Africa, from a narrow focus on communicating environmental ‘messages’ and raising awareness about environmental problems, to a process of ‘deliberative co-engagement in the challenges and risks of the day’ (O’Donoghue 2007: 148). In the early developments

of the active learning framework, deliberation is implied through the series of ‘steering questions’ in Figure 2:

- What do we already know?
- What do we need to find out?
- Who can we go to for help?
- How will we investigate the issue?
- What can we do?
- What can we report on the issue?

The first three steering questions clearly have a dependence on foundational knowledge which can be either prior knowledge (what do we already know?) or new knowledge (what do we need to find out and who can we go to for help?). Fien’s reference to education *about* environment is clearly an objective here. The new knowledge described can be sourced from many different places, as suggested by Wals’s argument that problem solving needs to involve ‘the integration of multiple perspectives, the co-designing of viable alternatives, the utilisation of diversity, and the simultaneous development of a whole range of sustainability related competences’ (2009: 385).

In South Africa, this multi-perspective vision of ESD was very different to the authoritarian pedagogy associated with apartheid South Africa, in which rote learning dominated and learners were seen as passive receptors of knowledge (Janse van Rensburg 2000). Therefore, a distinction between passive and active learning became significant in South Africa. For an understanding of active learning, it is important to make a distinction between active learning in the Piagetian sense of learners ‘actively constructing their own development, through their interactions with the environment’ (Capel et al. 1995: 219) and activity-based learning in which the cognitive meaning-making process can easily be sidelined through an over-emphasis on hands-on practical action. Rosenberg, O’Donoghue and Olvitt (2013) drew attention to this possibility of sidelining meaning-making when noting that those involved in projects and practical actions (methods under the banner of ‘learning-by-doing’) may be so absorbed in the practical activity that they neglect to reflect on what they are learning. This point is also made by Vinjevald and Taylor in their concern that:

Learning must involve cognitive and affective activity and not merely movement and speech. Thus ... if not carefully structured and guided by the teacher, [educational activity] succeeds only in passing the time without engaging the cognitive faculties of participants, and thus results in little or no learning. (1999: 65)

In essence, the distinction being made here is between hands-on/minds-on learning as opposed to simply hands-on learning.

Important across all national projects has been the role of disciplinary knowledge in understanding everyday problems without falling into the trap of over-emphasising

everyday knowledge at the expense of formal school knowledge. This is consistent with concerns about education quality raised in South Africa, regarding how important it is that ‘the two-way relationship between everyday and school knowledge provides important pedagogical tools for inducting learners into the art of formal discourse, and for the practical application of formal knowledge to problems in the real world’ (Taylor 1999: 113). Thus, there is an important role to be played by subject-specific knowledge in deepening and grounding the understanding of environmental issues within the situated learning processes described previously.

Examples of discipline exploration developed by the NEEP-GET at the time of an outcomes-based focused curriculum include a description of the role of each subject in contributing to environmental understanding:

- Life Sciences was described as important for ‘ecosystem and biodiversity studies, and to develop a good understanding of the threats to biodiversity, and why biodiversity is an important dimension of ecosystem maintenance’ (South Africa DoE & NEEP-GET 2004: 14).
- Economic and Management Sciences was described as preparing learners to ‘adapt to, and participate in an economically complex society, which includes the sometimes conflicting aims of promoting productivity, social justice and environmental sustainability’ (p. 18).

The NEEP-GET developed extensive explorations for all curriculum disciplines and the above extracts are illustrative of the role played by the NEEP-GET in highlighting the important explanatory power of the different disciplines. Acknowledgement of this discipline-based explanatory power was not explicit in the active learning framework at the time, but the 2019 framework now highlights the role of CAPS knowledge in Quadrant 1 (O’Donoghue 2019: 7).

In a further example of discipline-based work, in the Schools and Sustainability Course, teachers explored their specific disciplinary areas for opportunities for developing enquiry-based activities in order to gain understandings of environmental challenges they had identified in an earlier contextual profile of their school and community. Teachers were introduced to a variety of qualitative and quantitative ideas for hands-on enquiries, as well as tools for supporting these enquiries, and then encouraged to find or develop their own enquiry tools to suit the focus of their lesson plans. Different methods used in different disciplines included quantitative audits (for example, water use), ecological studies, observations, mapping, descriptive essays, surveys using interviews, and surveys using questionnaires (Schudel et al. 2008b). This emphasis on methods in disciplines highlights how the disciplines provide skills and procedures (procedural knowledge) to gather information about phenomena in addition to the content and concepts that describe and explain these phenomena (propositional knowledge). These two types of knowledge are based on the understanding that a subject ‘is composed of two epistemic domains, the “know how” or procedural knowledge’ or the ‘know that’ or propositional domain (Muller 2014: 263).

When reflecting on the deliberative nature of environmental learning it is also important to acknowledge that deliberations may often be value-based. Thus, not only are they ‘minds-on’ but also have an affective component. Olvitt describes value-based deliberations as ethico-moral and elaborates by explaining that our deliberations are ‘moral in terms of our practical and often private deliberations about our conduct in a world characterised by injustice, risk and uncertainty, and ethical in terms of the theories and patterns of thinking in society that influence how we distinguish right from wrong’ (2017: 12). Deliberation is a process whereby people ‘recognize, evaluate and, when needed, potentially transcend or break with existing social norms, group thinking and personal biases’ (Wals 2007b: 39).

Concurrent with the interest in democratic and constructivist educational processes in South Africa has been an interest in South African ESD pedagogy in social learning. Wals describes social learning as ‘learning by mirroring one’s own ideas, views, values and perspectives with those of others’ (2009: 385). A particular challenge with social learning is that the integration of perspectives is often not viable due to oppressive power relationships. Pedagogies embracing strong constructivism can lead to a relativist ‘anything goes’ outcome in environmental deliberations. From a critical realist perspective, Price explained that this ‘leads to the inability to act, since how can we act if we cannot choose between better or worse?’ (Price 2007: 107). For example, the concept of sustainability is also open to relativist interpretations leading to an ‘ambiguity that, somewhat paradoxically, provides the focus for discourse about a variety of issues within the contemporary problematique, while undeniably also providing fuel for those who would procrastinate in their resolve to seek sustainability’ (Bawden 2004: 21). Instead, we can conceive of a weak (non-relativist) constructivism (Brown 2009; Lotz-Sisitka 2008) in which views of reality can be constructed in the minds of learners, but remain open to critique, and still need to stand up to tests of truth and normative judgements. This critique is dependent on philosophically embracing the importance of ‘judgemental rationality’ which ushers in the question of ethics, thus enabling the possibility for ‘explanatory critique of consciousness (and being), entailing judgements of value and action’ (Bhaskar 1994: 71).

Of course, normative judgements are themselves constructed so that we are called to examine the shaping influences and practical adequacy of prescribed normative frameworks – as suggested by Lotz-Sisitka and Schudel (2006). The authors drew on Sayer’s concern that normative arguments pose the danger of ‘empty moralizing [and] of assuming that whatever is agreed to be good, will therefore come into being’ (Sayer 2000: 178). Sayer argued that a critical realist argument would need to ‘think about the feasibility of desirable alternatives in terms of how the recommended social processes would work, asking counterfactual questions, conducting thought experiments and scrutinising critical standpoints (p. 178). This highlights the importance of deliberation in ESD processes.

A further comment on deliberation is that it is seen in the context of sustainability practices as discussed in a previous section. O’Donoghue called for ‘practice-based deliberations that might allow the better mediation of choices that are more reality

congruent and socially responsible’ (2007: 153). This aspect of deliberation links to Fien’s education *through* the environment as described in section two of this chapter and is consistent with Uzzell’s (1999: 404) call for ‘authentic learning’ so that actions developed in school are not ‘surrogate or fantasy actions’ but authentic and close to the reality learners might find themselves in after school. In this way deliberations are not taking place in a whirl of ideas but are reflecting off tangible practices and dilemmas. Similarly we can note that ethico-moral deliberation does not happen in a whirl of emotions but in relation to the cognitive skills highlighted above. This is important because ‘lack of knowledge reduces our capacity for effective moral agency’ (Parker 2010).

The descriptions of reflexive deliberation in this section can thus be summed up as deliberations between and amongst the cognitive, affective and practical dimensions of learning. It is these deliberations that enable a reflexive approach to ESD driven by ‘dissonance created by introducing new knowledge, alternative values and ways of looking at the world [to] become a stimulating force for learning, creativity and change’ (Parker 2010: 39). Reflexivity links to the emphasis on assessment and higher order cognitive thinking levels (analysis, evaluation and innovation), introduced in the reworked active learning framework as discussed in a previous section above. In the reflexively deliberative work of environmental learning (see Chapter 12 for the challenges with reflexive approaches to learning) it is the ‘making sense’ of different perspectives (analysis), the comparisons across cases and contexts (evaluation), and the identification of new ways of being and seeing (innovation) that engage these higher order thinking skills.

Principles for active learning

This chapter has presented the active learning framework as an open-ended framework for structuring environmental learning, through including activities where learners work with environmental information, conduct enquiries in their local environment, consider appropriate actions towards sustainable living, and reflect critically on the process. The chapter has reviewed guideline documents as well as research and evaluation reports across four historically significant national programmes that have influenced the development and implementation of active learning in South Africa. It has elaborated on these using influential educational and ESD research literature in the country, in particular drawing on a critical realist dialectic to extend conceptions of active learning. The historical research as well as the elaborations with dialectical critical realism helped to set the scene for the emerging conceptions of active learning in the Fundisa for Change programme, which followed the four South African ESD programmes highlighted in this study. The critical realist dialectic has strengthened perceptions of agency (embodied intentional causal absencing – see introduction to this chapter) in active learning by contributing to:

- the groundedness of a situated approach to active learning,

- an understanding of structure/agency relations in the emancipatory agenda of an action-orientated approach to active learning, and
- a need for judgemental rationality in a reflexively deliberative approach to active learning.

The chapter has identified and described three core features of active learning, following this, this chapter now proposes core principles for strengthening active learning in national and international ESD processes.

Principles for active learning as situated pedagogy. Active learning should:

- Situate problem solving and sustainability practices in socio-cultural and historical context.
- Situate sustainability practices and problem solving in intergenerational and indigenous knowledge.
- Situate global and generalised environmental issues and risks in local contexts.
- Explore non-actualised possibilities as intervention points for change.
- Search for concrete utopian visions for change in context that yield visions for both hope and possibility.

Principles for active learning as action-orientated pedagogy. Active learning should:

- Be conscious, considered and targeted at an environmental issue.
- Search for opportunities for positive and empowering change.
- Address environmental problems and sustainability practices from both an individual and a systemic perspective, with focus on positions and practices for understanding relationality between these.
- Ensure co-creation and co-ownership of solutions in context with deference to deep democracy.

Principles for active learning as reflexively deliberative. Active learning should:

- Strengthen deliberations in relation to propositional and procedural knowledge of discipline knowledge.
- Employ counterfactual questions and thought experiments, and scrutinise critical standpoints in finding resolutions that stand up to tests of truth and normative judgements.
- Employ reflexive engagement within and between the cognitive, affective and practical dimensions of knowledge.

It is hoped that the histories and new insights into active learning offered by dialectical critical realism in this chapter will inform and guide national and international perceptions and practices in ESD.

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Appendix A: Document log for historical review of active learning

Programme/ Course	Document name	Author(s)	Pub. date	Type of document	Further information
Learning for Sustainability Course	The Learning for Sustainability project: An overview of the conceptual framework.	Janse van Rensburg	2000	Research Report	This document summarised the conceptual rationale for the Learning for Sustainability Course.
NEEP-GET Programme	Environment in the NCS: Guidelines for learning area working groups writing learning outcomes for the NEEP	Janse van Rensburg	2001	Guideline Document	A guideline document for project partners to help them develop an understanding of how to work with the environmental focus that had been integrated into the curriculum.
NEEP-GET Programme	Active learning through OBE: An interdepartmental support for the piloting of environmental learning in Grades 4-8	Schudel, Dambuza, Lotz-Sisitka, Magonare, O'Donoghue & Solomon	2000	Guideline Document	This book was developed to help pilot active learning in the context of Curriculum 2005.
NEEP-GET Programme	Active Learning in OBE: Environmental Learning in SA Schools	Lotz-Sisitka & Raven	2001	Evaluation Report	NEEP: This was an evaluation report developed for the GET Pilot Project: August 2000 to February 2001.
NEEP-GET Programme	Formative Monitoring and Evaluation Final Report: Storyline of a project in context: NEEP-GET in the Eastern Cape	Raven, Timmermans, Lotz-Sisitka & Nduna	2005	Evaluation Report	This was part of the monitoring and evaluation of the post-pilot NEEP-GET programme: 2001–2004.
NEEP-GET Programme	A critical dialogues monograph: Building capacity for environmental learning in South Africa's education system	NEEP-GET	2005	Research Report	This research report analysed dialogues among key partners in the NEEP-GET programme.
Eco-Schools Programme	Eco-Schools South Africa: Handbook	Eco-Schools	2009	Guideline Document	This document outlined the programme and gave guidelines and suggestions for certification.
Eco-Schools Programme	Methods and processes to support change-orientated learning	Rosenburg, O'Donoghue & Olvitt	2013 (reprint)	Guideline Document	This document was developed for use among Eco-Schools partners and was reprinted for Fundisa for Change.

Chapter 8
Theorising Active Learning – A Historical Analysis

Programme/ Course	Document name	Author(s)	Pub. date	Type of document	Further information
Eco-Schools Programme	Evaluation of the Eco-Schools South Africa programme	Rosenburg	2009	Evaluation Report	This was an extensive evaluation report of the national EcoSchools programme.
Schools and Sustainability Course	Course Orientation, Unit 2 and Unit 3	Schudel, Hoffmann, Wigley & Conde	2007	Course Materials	These materials were developed for the courses run nationally around South Africa, and redeveloped each year. These were the materials for the Eastern Cape tranche of the course.
Schools and Sustainability Course	Examining emergent active learning processes as transformative praxis: The case of the Schools and Sustainability professional development programme	Schudel	2013	Doctoral Thesis	This was the last study conducted of the Schools and Sustainability course, and it included a meta-analysis of all previous Schools and Sustainability materials and evaluation reports.