LEARNING TODAY FOR TOMORROW

Sustainable Development Learning Processes
in Sub-Saharan Africa

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01
INTRODUCTION

This research paper argues that sustainability requires more than legal frameworks, financial resources and green technologies. It puts forward an argument that education, while not being a sufficient condition for achieving poverty reduction, sustainability and human well being, can provide an important social context for transformation of society. Central to this is the way in which educators think about learning processes.

The report draws attention to developments in thinking about learning processes, and the contribution that ESD learning processes can make to educational quality. The authors of this report are mindful of the fact that education cannot solve all problems but also recognise the fact that education is an important factor for empowering society to make the transition to a sustainable future. History has shown that education, with a focus on learning, can play a significant role in overcoming social, economic and environmental challenges.

The report was developed to contribute to dialogue surrounding the 2012 mid-term evaluation of the UN Decade of Education for Sustainable Development, and its focus on ESD learning processes. Africa's participation in the mid-term evaluation of the UN Decade of Education for Sustainable Development was impeded by a lack of adequate communication mechanisms, and an inadequate continent-wide understanding of why ESD is an important focus for future education and training on the continent (UNESCO, 2009). Hence contributions such as this are needed to foreground what ESD has to contribute to education in Sub-Saharan Africa.

OBJECTIVES OF THE UN DESD AND THE AFRICA STRATEGY FOR ESD

The scope of the United Nations Decade of Education for Sustainable Development (UN DESD) is broad and its potential effects are far-reaching. The primary goal of the DESD spelt out in the United Nations General Assembly Resolution 59/237 'encourages Governments to consider the inclusion of measures to implement the Decade in their respective education systems and strategies and, where appropriate, national development plans'. To this end, the DESD aims to integrate values, activities and principles that are inherently linked to sustainable development into all forms of education and learning. It also aims to help usher in a change in attitudes, behaviours and values to ensure a more sustainable future in social, environmental and economic terms.

Education for Sustainable Development, as practised in Sub-Saharan Africa, aims to shape a world where education works with methods, processes and contents that encourage learners to critically assess the status quo, question unjust and unsustainable development patterns, find innovative solutions to emerging issues and adapt their social practices. This should be based on valued beings and doings, guided by principles of social justice, equity, sustainability and care for the community of life.

In traditional schooling and universities, thinking and practice are confined within the boundaries of disciplines and organisational culture. These boundaried environments present an important site for ESD learning processes, but are, at the same time,

inadequate sites for ESD. This requires ESD practices and learning processes to 'cross boundaries' between schools and communities; universities and society; the world of work and social contexts in which people live and learn. ESD learning processes cannot therefore be confined to schools and formal learning institutions only. They also need be constituted through transformative pedagogy within these institutions.

The UNESCO Regional Office for Education in Africa spearheaded development of a draft regional strategy for the implementation of the UN DESD in sub-Saharan Africa. The strategy aims to harmonize implementation of ESD; broaden public awareness; promote an education system that enhances African culture, especially when it contributes to sustainable development; strengthen the quality of education [note the emphasis on relevance and quality]; and consolidate and diversify partners. The Draft ESD Strategy for Sub-Saharan Africa promotes strengthening both vocational and technical education and non-formal education.

All regions of sub-Saharan Africa were invited to contribute to the strategy (UNESCO, 2006). In 2006, at the ADEA Biennale, the Ministers of Education in Africa reviewed the Draft Strategy on Education for Sustainable Development in Sub-Saharan Africa, and undertook:

To support the United Nations Decade on Education for Sustainable Development;

To ensure further consultations on the framework of the draft strategic framework;

To support the development of Strategies for the implementation of the United Nations Decade on Education for Sustainable Development in our respective countries and on the continent, within the framework of the African Union (AU) second Decade on Education;

To ensure that the principles of sustainable development are included in educational development frameworks, programmes and activities at all levels;

To ensure that African cultures, knowledge systems, languages and ways of life are integrated into frameworks, programmes and activities developed within the Decade;

To strengthen existing partnerships and promote new ones for the implementation of regional and national strategies on education for sustainable development;

To call upon the International community to support the implementation of United Nations Decade on Education for Sustainable Development in Sub-Saharan Africa; and

To urge UNESCO to strengthen its role as a lead agency in support of Sub-Saharan Member States to achieve the goals of the United Nations Decade on Education for Sustainable Development.
(Developed in Libreville, 28 March 2006)

This initiative to develop knowledge of ESD Learning Processes on the African continent therefore addresses two aims:

To develop knowledge of ESD learning processes on the African continent as a contribution to the UN DESD Monitoring and Evaluation programme of action; and

To share examples of ESD learning processes and knowledge of how such processes can contribute to educational quality and relevance in Africa, since this is a primary issue of concern at all levels of the Education and Training system on the African continent.

02
CONCEPTUAL AND METHODOLOGICAL FRAMEWORK

STUDY METHODOLOGY

The overall purpose of this study is to undertake an interpretive, qualitative analysis of ESD learning processes, with a view to establishing key features of such learning processes, and to analyse how these may contribute to educational quality and relevance. This study contributes to the debate about ESD learning processes by means of three strategies:

A contextual analysis of factors shaping and influencing ESD learning processes and their conceptualisation in Africa;

An in-depth literature review of ESD learning processes as produced by scholars on the African continent. This has been done through the development of an analytical framework for examining literature on ESD learning processes before analysis of literature. Included in the literature are references to post-graduate studies and published works on ESD learning processes where these exist (it should be noted that only one regional journal exists that focuses directly on Environment and Sustainability Education / ESD in Africa; and few post-graduate research programmes exist in this area as yet); and an

Analytical review of a number of case studies of ESD learning processes (sourced from ESD network partners and institutions involved in implementing ESD learning processes in a range of education and training contexts including schools, universities, Technical and Vocational Education and Training Centres (TVET centres, adult/community/youth learning contexts). This was done through the development of a case study template that was widely distributed, requesting short write-ups (1000 words) of ESD learning process case studies.

The case studies used in this publication were developed from a common protocol. These have been analysed. Analysis of the case studies, informed by the contextual and literature reviews, show that the following story can be told about ESD learning processes (see propositions below), and that this provides a future research agenda that can be further developed to more fully understand the contribution that ESD learning processes make to Educational Quality and Sustainable Development education. The 'story' that can be told speaks to four propositions that have been identified as 'characterising' an interest in ESD learning processes in Sub-Saharan ESD discourses and practice.

Proposition 1: ESD learning processes strengthen participation and meaning making, and can enable 'Learning as Connection';

Proposition 2: ESD learning processes develop learners' capabilities (making choices about what is valuable to be and do), action competence (abilities to act); critical thinking skills (i.e. critical analytical capacity) and agency (evidence of actions);

Proposition 3: ESD learning processes help to make education relevant;

Proposition 4: It is possible to improve educational quality through ESD learning processes.

These four propositions are used to structure the report and help to develop knowledge of ESD learning processes on the African continent.   By drawing on case studies from the range of partner networks co-ordinated by the partners throughout Africa, and through developing an analytically sound perspective on ESD learning processes (for reporting on the ESD learning processes) across different parts of the education and training system, this report provides a useful 'central' document that can be used by the networks for furthering knowledge and practice in ESD Learning in a range of contexts across the continent. It also provides a basis for further monitoring and evaluation, and for further in-depth research into ESD learning processes and their contribution to educational quality and relevance.

Further expansion of practice examples, complimented with analysis of ESD learning processes as modelled in this report, can feed directly into a wider network of ESD activities. They can therefore have a substantive impact on Teacher Education Innovations on the continent and on the support provided for ESD learning processes by governments and stakeholders involved in furthering ESD in Africa.

ESD LEARNING PROCESSES

Learning processes lie at the heart of all education practices, including Education for Sustainable Development practices. The Bonn Declaration, produced out of the first World Conference on Education for Sustainable Development in 2009 states that:

A decade into the 21st century, the world faces substantial, complex and interlinked development and lifestyle challenges and problems. The challenges arise from values that have created unsustainable societies. The challenges are interlinked, and their resolution requires stronger political commitment and decisive action. We have the knowledge, technology and skills available to turn the situation around. We now need to mobilise our potential to make use of all opportunities for improving action and change ... ESD emphasises creative and critical approaches, Long-term thinking, innovation and empowerment for dealing with uncertainty, and for solving complex problems. ESD highlights the interdependence of environment, economy, society,

and cultural diversity from local to global levels, and takes account of past, present and future. ... [and] ... Linked to different needs and the concrete living conditions of people, ESD provides the skills to find solutions and draws on practices and knowledge embedded in local cultures as well as in new ideas and technologies. (UNESCO, 2009)

This sets an agenda for ESD learning processes that are connected to real life challenges and they are creative, critical, empowering, engaged with risk and uncertainty, and with local and global cultures, practices and ideas. learning processes are cross cutting, as they are required to promote critical knowledge, skills, action competence and capabilities (people's valued beings and doings at individual and societal levels). As part of the mid-term evaluation of the United Nations Decade of Education for Sustainable Development (2005-2014), UNESCO released an expert study on ESD learning processes entitled "Education for Sustainable Development: An Expert Review of Processes and Learning" (Tilbury, 2011). The document makes the important point that ESD learning, in addition to reference to the gaining of knowledge, values and theories related to sustainable development, also refers to:

learning to ask critical questions;

learning to clarify one's own values;

learning to envision more positive and sustainable futures;

learning to think systemically;

learning to respond through applied learning; and

learning to explore the dialectic between tradition and innovation (Tilbury, 2011, p. 104).

In the second phase of the UN DESD, the UNESCO ESD Monitoring and Evaluation Working Group have decided to focus on ESD learning processes in an attempt to identify how ESD contributes to economic, environmental, social and education change (see UNESCO, 2012). The review unpacks and categorises the range of potential contributions and priorities that are apparent across these key initiatives. It also aim to inform a better understanding of what is meant

by ESD and how it ought to be implemented. While these and other statements on ESD are easy to locate and find in strategies and guideline documents on ESD, there is few empirical evidence-based analyses that shows how ESD learning processes contribute to educational quality and relevance, this is an issue that this report also responds to; although it makes the important point that a much more substantive research programme on ESD learning processes and educational quality and relevance is required to make substantive claims about the relationships that exist between ESD and educational quality and relevance. Tools for such a substantive research programme are provided as a means for taking this research agenda forward.

The 2011 UNESCO evaluation report on ESD learning processes (Tilbury, 2011) also acknowledges that "One critical lesson learned through the review process is that it is difficult to access data on ESD processes and learning opportunities as these are rarely documented in sufficient detail in the literature". The 2011 UNESCO study recommends focusing on "actual experiences rather than reviews of the literature", and "data collection based on tightly focused questions that will capture greater detail about learning processes and learning opportunities" (ibid.). This is the premise upon which this publication has been developed – by means of case studies which illuminate the actual experiences of practitioners in ESD.

Until recently, there have been few definitions, elaborations and discussions on what ESD learning processes are. Unfortunately there are almost no comprehensive studies conducted to understand the existing ESD learning processes in an African educational context. This study acknowledges the fact that the various smaller scale studies done so far provide useful insight in this regard. To understand ESD learning, there is need to (1) develop a theory of learning that meets the challenges of social transformation; and (2) learn new ways of thinking to match the new kinds of environmental and social challenges in the context of sustainable development. Thus there is an urgent need for fundamental change to create a common purpose and the conditions for individual and collective forms of agency and responsibility for the future.

Perhaps, ESD learning should be understood as a process of discovery that generates new understanding about ourselves and the world around us. We can also associate ESD learning with influences upon our understanding and our abilities to act individually, collectively and relationally in response to and in anticipation of risks and emerging challenges (Mukute & Lotz-Sisitka, 2012). Learning helps us to discover why things are as they are and how they might become. The distinction between knowledge, understanding and expression of valued beings and doings, deepens our grasp of the layering of learning. Effective learning leads to action and grows out of the experience which helps to create the capacity for self and societal creation.

Scott and Gough (2003) note nine categories of interest in / for ESD learning processes which capture, albeit in a tentative way, a range of focuses and objectives of those who espouse an interest in ESD. Some of the foci include: environment, society and social change relations; desired outcomes: values, understanding, skills, changed behaviours; social justice and democratic citizenship skills to name a few. Scott and Gough (2004), drawing on Bateson, have also discussed ESD Learning as being not only a process of single loop learning, but that it in fact involves double and triple loop learning, which effectively means challenging the status quo, and developing critical analytical competence to review the status quo and meta-analytical skills in and through the learning process.

Yet other theorists are increasingly focusing on the levers and mechanisms that enable ESD learning processes to evolve and flourish. For example, some researchers are considering the way in which a range of culturally embedded behavioural patterns often contradict norms and understandings, and thus the 'use' of new knowledge and practices. Individual decisions, and ESD learning processes therefore take place in conditions in which norms and ethics are in conflict with other factors which may be more dominant (e.g. the influence of poverty or beliefs about gender relations on learning processes) (Henie & Mautz, 2001). There is an increasing body of research that is showing the significance of engaging with tensions and contradictions that are the result of deeply seated structural contradictions (Mukute,

2010; Masara, 2010; Silo, 2011). This is an important feature of ESD Learning and it is the process of ESD learning that is significant as a change / expansion process in society. This brings the question of how ESD learning processes engage people in processes of social change or how the process of formal learning translates into lived processes at the micro scale (Mukute, 2010; Masara, 2010; Silo, 2011).

This interest in engaging tensions and contradictions in expansive learning interactions, also brings the importance of situated learning to the fore, an approach to learning that focuses on systems in which individuals act as members of social groups and interact with material resources, situated in historical and cultural contexts (Gerstenmaier & Mandi, 2001). ESD learning processes are, within a situated learning framework, seen as active and constructive processes in which participation in a system of shared and distributed knowledge and practice emerges in ways that are also contextually located and situated in the 'real world' out of which learning praxis emerges. In this way, ESD learning processes can therefore also be described as 'adaptation' to constraints and affordances (Chabay et al., 2011). The interest in these approaches to learning is growing, as societies realise the scope of adaptation that will be required in response to climate change and ongoing environmental degradation and societal stress caused by HIV/AIDS and poverty.

In an ESD study undertaken in a southern African context, researchers (Lotz-Sisitka & Zazu, 2012) consider how education is being conceptualised at the interface of poverty, environmental degradation and health conditions. In making an argument that 'context counts' in environment and sustainability education, they opined that, in a context affected by these three interacting issues, education ought to be supporting communities and learners to develop capabilities and

action competence for risk negotiation in the everyday, since risk is fast becoming the 'norm' for many societies in Africa. Such an education, they argued, required proactive engagement with risk reduction and mitigation; reactive engagement with the consequences and impacts of risk (e.g. the impacts of the HIV/AIDS pandemic); and critical, advocacy-based education that strengthened institutional efficacy and state accountability. Authors such as Namafe (2008) claim that such education should also be based on, and emerge out of existing strengths at individual, community and societal levels and should be based on people's valued beings and doings.

Within such a concept of education, participation becomes a central element of ESD learning processes and socio-cultural perspectives of learning become significant in enabling participation and meaning making (Mukute, 2010; Lupele 2007; Masara, 2010; Silo, 2011). These perspectives accord with developments in learning theory (see Table 1) which shows development from earlier behaviourist theories of learning (which sadly still dominate most African children's education), to cognitive theories of learning, and more recently participative, socio-cultural theories of learning (note that these are historically intertwined, and the table below therefore only presents a somewhat simplistic heuristic).

ESD learning processes therefore introduce engagement with substantive learning theory in African educational contexts. Researchers working on these issues are providing useful insights into the relationship that exists between knowledge, learning and meaning making, issues which have been somewhat neglected in the drive to attain 'Education for All' which, in many cases has focused on structural aspects of education, at the expense of process aspects of education.

TABLE 1. A BROAD OVERVIEW OF DEVELOPMENTS IN LEARNING THEORY RESEARCH
(USEFUL AS A HEURISTIC ONLY)

Perspective	Behaviorist	Cognitive	Situative / Social
Knowing as...	Having associations affecting behaviour	Conceptual and cognitive development Personally meaningful	Distributed, relational and embodied cognition
Learning as ...	An organised accumulation of associations and components of skills	Understanding of concepts and theories in different subject matter / disciplinary domains, and general cognitive abilities	Becoming more adept at participating in distributed cognitive systems; engagement in interpersonal relations and identity in communities of practice; engagement with dissonances that exist in and between people and activity systems; networked relations
Learning and transfer ...	Acquiring and applying associations Behavioural and attitudinal change	Acquiring and applying conceptual and cognitive structures	Initiation and induction; development of shared repertoires; collective and relational forms of knowledge and agency; uncertainty
Motivation and engagement ...	Extrinsic motivation	Intrinsic motivation	Engaged participation Connectedness
Focus on accountability and assessment ...	External	Individual	Community Networked relations
Underpinning links to theories of societal change ...	Societal change is attendant on responses to conditions or stimulus inputs	Societal change is attendant on the 'knowledgeable actor'	Societal change occurs through learning interactions amongst members of communities of practice and/or through within different human or cybernetic activity systems and networks

Cited in Chabay et al., 2011, p. 28 (adapted from Reid & Nikel, 2007, p. 40). Note: This table is intended to be illustrative rather than exhaustive.

ESD learning processes are, however, not exclusively concerned with issues of participation in education, or with situated learning approaches. They are also interested in acquisition of knowledge, values and skills, and with individual cognitive development of learners. Sfard (1998) argues that education should be concerned with both acquisition and participation. However, as ESD learning processes are concerned with societal change, the participation interest in ESD learning processes cannot be neglected; and needs to be foregrounded as a means to strengthen acquisition of concepts, knowledge and values. Chabay et al. (2011, p. 28), citing Reid and Nikel (2007, p. 41) state that a key feature of Table 1 (see above) is "that people's capacity for participation in societal change processes is learnt, *constructed and dynamic* – and that this *can be enhanced* (rather than being regarded as something that is, for example, fixed, largely inherited, or stable)" [emphasis added].

Chabay et al. (2011, p. 27) suggest too that current ESD learning process research approaches tend to "strongly underestimate the importance of local and indigenous knowledge, as they mostly focus on its contents, but not on its importance for value systems, local theories-in-use, and hence its role in the learning process". Similar findings are expressed in the work of indigenous knowledge researchers interested in ESD learning processes (Shava, 2005; Mokuku & Mokuku, 2004; Asafo Adjei, 2004). Shava (2010, p. 40) for example, explains that:

A critical aspect in the development of indigenous knowledge is the resilience of indigenous knowledge systems as evidenced by the continued sustenance of traditional medicinal practice and traditional cultural practices even in urban settings [...] This shows that indigenous knowledge is not entirely lost [...] however, these practices are often not represented in formal educational settings, and if so, it is normally the researchers' anthropological eye that dominates the representations.

O'Donoghue, Lotz-Sisitka, Asafo Adjei, Kota & Hanisi (2007) argue that mobilising indigenous and local knowledge in ESD learning processes is an act of enabling epistemological access to abstract forms of knowledge that tend to circulate in schools and universities. These authors draw their claims back to an understanding of mediation in education. Shava (2010, p. 40) goes on to argue that "we need to constantly evaluate what knowledge is represented, and most importantly, how it is represented and applied."

Zaalouk (2004), writing from North Africa, explains such forms of ESD learning more directly as a 'pedagogy of empowerment', while writers from Southern Africa (Namafe, 2008; Shumba et al., 2008; Ketlhoilwe, 2008) note that ESD learning processes are moreover about epistemological changes in the way in which knowledge is viewed and worked with in educational settings. In such settings they say, local and indigenous forms of knowledge are also 'counted' as being valid in the educational context and are introduced into processes of enabling epistemological access.

03

WIDER CONTEXTS INFLUENCING ESD LEARNING PROCESSES

Human existence has always involved living together (society), shared goods and services (economy), as well as shared ways of life, beliefs, values and symbols (culture). Through histories of colonialism and the rise of modern industrial and technological development in the last three centuries, a wide array of social practices, lifestyles, communication, production systems and consumption patterns have changed rapidly, not least in Africa. Mamdani (1996) comments on these changes, stating that the inequalities that are the aftermath of these patterns of global development, have left Africa at a 'crossroad' positioned between 'modern citizens' modelled according to the dictates of the neoliberal world order, and 'traditional subjects', modelled according to the dictates of historically constituted forms of tradition and culture. He argues that neither of these are adequate responses to the current changing global world order; and that Africa needs to define a 'new synthesis' for development. This argument for a deep 're-thinking' of development directions is also put forward by critical development theorists (e.g. Ferguson, 2006; Bond, 2004; Cheru, 2002), who show how Africa is currently being re-colonised by the flows, power and movement of transnational capital, which colludes with state power and the 'roll back' of the state, often exacerbating poverty and reducing net wealth, at the expense of the majority of the continent's people. Africa's development path, and concepts of sustainable development are thereby deeply intertwined with a set of complex geo-political and economic trajectories.

As the twenty first century continues to unfold, the process of globalisation continues to disperse through African and other economies and political institutions, which make the connections between global shifts and local actions more visible (Mythen, 2004). As stated by Mythen (2004, p.1), societies at the start of the 21st century are characterised by risk:

Economic convergence, political fluctuation and national insecurity have become the motifs of the age. We are living in a 'runaway world' stippled by ominous dangers, military conflicts and environmental hazards. As a result, increasing portions of our everyday lives are spent negotiating change, dealing with uncertainty and assessing the personal impacts of situations that appear to be out of control. In one way or another, the defining markers of modern society are all associated with the phenomenon of risk. In contemporary culture, risk has become something of an omnipresent issue, casting its spectre over a wide range of practices and experiences. Locally risk emerges as a routine feature of existence in areas as diverse as health, parenting, crime, employment and transport. Globally, concerns about air pollution, the state of the world economy, and the spread of AIDS are all underscored by risk.

Thus, the global challenge that faces Africa in particular, is of how to transform its development path. This involves addressing interrelated issues such as poverty (economy), social inequality, peace and health risks (society), natural resource depletion, biodiversity loss and global climate change (environment) and culture. Within this wider challenge associated with redefining the very notion of development, are a range of associated issues and conditions. It is well known

that the African continent is also challenged with numerous sustainable development issues such as the increased risks associated with climate change; the impact on societies and production systems created by the HIV/AIDS pandemic; and the legacies of years of colonial imposition, with structural adjustment and governance mechanisms that have not fully been able to address the challenges of poverty and other problems that come to bear upon the African continent's development path. Despite these commonly noted problems that influence development on the African continent, there is a fundamental need to develop knowledge, skills, values and capabilities in order to maximise the wealth of resources and the base of cultures that exist on the continent, and to ensure that future generations are able to live sustainable lives free from poverty and other factors that impede quality of life. For this, new concepts of educational quality are needed to guide education across the continent.

WIDER EDUCATIONAL CONTEXTS

While statements and objectives such as those noted above on ESD and education in Africa are laudable, and are to be welcomed, it is true that these objectives to transform education in Africa are implemented in a context that experiences numerous challenges. For example, the objective to provide education for all in Africa has been hampered by inadequate human resources, infrastructure and other material requirements, including quality teacher education. Hence, while ESD might take advantage of existing policy reforms in education, there is need to provide good quality orientation on ESD that can be used within Education for All (EFA) and other policy related initiatives; hence the focus on the cross-cutting issue of ESD learning processes in this report.

Education empowers people for their role in society and therefore is of vital importance to promote the sustainable development of our global community. The Millennium Development Goals, adopted by the UN General Assembly in 2000, and the WEHAB Initiative proposed by the UN Secretary General Kofi Annan during the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg, both underscore the role of education in improving peoples' lives. It is broadly understood that literacy is a critical contributor to sustainable development,

and that literate parents substantively improve children's chance of success in schools. Women's empowerment and the literacy of mothers have also been identified as significant potential contributors to sustainable development. Education for All plays a crucial role in preparing children for their future in a highly connected, interlinked and globalised world, but as has been identified by UNESCO in the Education for All Global Monitoring Reports, Education for All must also provide *quality education;* and this remains poorly defined on the African continent in particular (Tikly et al., 2010).

Post-schooling education was recently the subject of discussions at the 2009 ADEA Biennale, where many issues associated with the education of youth were discussed, including sustainable learning pathways, articulation of education systems, and the relationships that exist between schooling and work. This conference showed that there is a need to reflect more on the range of skills to be acquired in post-schooling education streams, particularly the balance between general knowledge, cognitive and life skills on the one hand, and pre-vocational skills on the other. This debate has long been a focus of ESD learning processes, with emphasis on *change oriented* vocational education and training that allows for lifelong and 'lifewide' forms of learning and a broadening of knowledge, values and skills beyond direct technical training for vocational practices only (Fien et al., 2008). These discussions, however, are still in their infancy on the African continent.

Higher education has also been identified as an important educational process for preparing future generations to learn to cope with the complexities of sustainable development. Nine of the forty chapters of the 2002 Rio Earth Summit Report, Agenda 21, noted the key role universities have to play to achieve sustainability. Universities form a link between knowledge generation and transfer of knowledge to society in two ways. First, they prepare the future decision-makers of society for their entry into the labour market. Such preparation includes education of teachers, who play the most important role in providing education at both primary and secondary levels. Second, they actively contribute to societal development through outreach and service to society. This role for universities has been recognised by the

UNEP MESA programme, and African professors have stated the following about the ESD learning process transformations that are needed in universities: Africa is soon to be one of the most youthful continents on the planet, and it is therefore imperative that the education and training systems on the continent expose learners to ESD learning processes that encourage for critical thinking, systems thinking and that allow for a dialectical engagement with tradition and innovation (i.e. that enable engagement with social change processes at micro and macro levels) (MESA Conference report, 2010).

A clearer articulation of ESD learning processes can provide a 'core substance' around which discussions might take place on *how* the education and training system is to enhance quality from a knowledge, skills and empowerment perspective; and can provide models of process and insights for curriculum design for teachers or other curriculum designers, adult education facilitators and learners alike.

HOW ESD CONTRIBUTES TO A SUSTAINABLE FUTURE

Education has been identified as an important social strategy for the realisation of a sustainable future. Education for Sustainable Development recognises that it is impossible to achieve sustainable development without appropriate education, training and public awareness for all sectors of society. ESD is fundamentally about values, with respect at its centre: respect for others, including those of present and future generations for difference and diversity, for the environment, for the resources of the planet we inhabit. It is a vision of education that seeks to balance human and economic well-being with cultural traditions and respect for the earth's natural resources. It emphasises aspects of learning that enhance the transition towards sustainability – including citizenship education; education for

a culture of peace; gender equality and respect for human rights; health education; population education; education for protecting and managing natural resources; and education for sustainable consumption. Thus, ESD has come to be seen as a multi-disciplinary and multi-sectoral process of learning; one that deals with how to make decisions that consider the long-term future of the economy, ecology and equity of all communities. Building the capacity for such future-oriented thinking is a key task of education; and one could argue that without giving attention to these issues, it would be impossible to offer an education of quality that is relevant in the 21st century.

Through its focus on society, economy, environment and culture, ESD seeks to enable people to develop the knowledge, skills and action competence needed to create and sustain a viable and equitable future for humans and all forms of life on the planet.

ESD re-orients the aims and purpose of education and training;

ESD brings a new values focus to education, training and public awareness; and

ESD improves the quality of education and learning.

To reach all sectors of society, ESD would need to be integrated into the entire education, training and public awareness system at national, regional and global levels.

Education for Sustainable Development extends its scope to deal with the complex amalgamation of issues relevant to environment, society and economy. ESD prepares people to cope with and find solutions to problems that threaten the sustainability of the planet.

04
ESD LEARNING PROCESSES AND EDUCATIONAL QUALITY AND RELEVANCE

In this section we present case-based evidence for four propositions that 'tell a story' of ESD learning processes and their relationship to educational quality. These four propositions are presented as a framework for further research and for the development of our understanding of how ESD learning processes may contribute to educational quality in Sub-Saharan Africa. At the end of each section, a set of questions are tabled, to guide ongoing engagement with the propositions put forward, based on our analysis of ESD learning process literature, contextual analysis and case study analysis work.

PROPOSITION 1: ESD ENABLES 'LEARNING AS CONNECTION'

ESD learning deepens notions of inclusivity, or inclusive concepts of quality – to be inclusive of culture, local context and issues and practices that have meaning in local societies (such as environment and sustainability practices; health education practices; lifelong skills; and citizenship practices). Learning as connection involves processes where learners make connections between what is being said and what is meaningful to them; it expresses the relationship between meaning making, context and concept. The UN Decade of Education is seeking to value socio-cultural notions of inclusivity and meaning making in education (see www.unesco.org/desd).

Within the SADC Regional Environmental Education Programme research programme and network, attention is being given to how socio-cultural discourses of educational quality are leading to improved learner achievement in relation to and in combination with efficiency discourses. For example, if a child is inducted into a complex scientific concept and process, such as fermentation, through reference to or from the entry point of his or her cultural experience of, for example, local beverage making, the scientific concept is easier to learn and grasp – particularly in contexts where learners are receiving instructions in a second or third language (O'Donoghue et al., 2007). Most African children are taught in western languages (as part of the colonial inheritance), which are often difficult to learn as their structures and vocabulary are often different and technically extensive. This requires that teachers make an extra effort to ensure that learners understand the vocabulary and concepts being used in classrooms. Culturally located concepts and experiences can assist with enabling learners to 'come to know' more complex concepts presented in abstract languages because they are more familiar to the learner.

Perhaps the best example of the notion of learning as connection can be found in many forms of African traditional education, or community oriented learning processes as also practised in other parts of the world. Before missionary and colonial education, for the vast majority of African societies, education was structured as an integral part of everyday lifelong learning (Mwanakatwe,1968; Irwin, 1993; WWF ZEP, 1999). Traditional education involved a detailed understanding of the local biological resources and helped to develop knowledge and skills that enabled people to adapt to and manipulate their land, flora and fauna. By the time a child became a teenager,

he/she had been exposed to an educational process facilitating the acquisition of knowledge and skills for survival and adulthood (Lupele, 2002).

Wals, Hoeven and Blanken (2009) argue that eco–systems are based on networks, mutual dependency, flexibility, resilience and sustainability as is the case in traditional education. They observe that in order to cope with issues of a 'risk society' (after Beck et al., 1997) we need learning processes that lead to greater reflexivity in which creativity, flexibility and diversity are released and used as tools to deal with the everyday challenges of the risk society in question. A reflexive society requires reflexive citizens who critically review and alter everyday systems that we live by and that we often take for granted (Wals et al., 2009); this requires learners to constantly evaluate what they are learning in relation to the real world, and to situations in which they have previous experience. This is not a conservative form of contextualism, but rather a sophisticated to-and-fro between everyday knowledge and school knowledge or formal learning and experiential learning. Capra (citied in Wals, 2007) argues that in trying to create a more sustainable world, we need to have a better look at how ecosystems work and need to become competent system thinkers. He describes systems thinking as "seeing connections and interrelationships, fine tuning functions and roles, utilising diversity, and creating synergies" (ibid., p.37).

In formal education settings, learning as a connection has curriculum implications – how can the curriculum be developed and/or practised so that it makes 'connections'? Most African countries have started to work with curriculum reform that allows for localisation beyond setting test scores or examinations. A localised curriculum attempts to bring local knowledge into schools, so that it can be recognised and so that it can be given respect. In some African countries however, localised curriculum means superficial integration of local content into the existing curriculum. In the following section we provide some examples of learning as a connection from Sub-Sahara Africa. Case study 1 is about an international training programme run in Sweden and Southern Africa. The training programme is built around a **Change Project**, whose purpose is to enable participants to link (i.e. make a connection between) the learning from their workplaces and the content of the International Training Programme, then back to their work context. This taking place in reflexive cycles of situating learning and new knowledge. Case study 2 provides an example of enabling social learning through curriculum localisation. The case study shows how formal schooling can be linked to local knowledge and skills. Case study 3 examines how local knowledge and skills in fish management was used to transform a formal college curriculum in Malawi. All three case studies in this section provide evidence of learning as a connection.

CASE STUDY 1
INTERNATIONAL TRAINING PROGRAMME (by Shepherd Urenje)

The International Training Programme (ITP) is a Swedish-African postgraduate course in ESD which was introduced in 2001 (then called the Advanced Course in Environmental Education). The course was developed as an educational response to inadequate capacity in the SADC countries to confront the sustainability challenges confronting the sub-continent. Participants are drawn from diverse positions of influence such as policy makers, curriculum developers, teacher education specialists and NGOs supporting formal education in Southern Africa. The programme has trained over 120 senior professionals in formal education between 2001 and 2007, from 13 countries in Southern Africa.

The ITP Programme is based on a reflexive curriculum model first pioneered and researched at Rhodes University in the WWF-SADC International Training Programme, that requires learning in-and-out of practice. This model has been widely applied in a range of professional development programmes in the SADC region, and in the UNEP MESA Training Programme. It is built around a *Change Project,* whose purpose is to enable participants to link their experience in their workplaces to what they learn. Through this iterative process, learners on the course engage with new concepts and contexts presented in the ITP, and relate these back to their work context in new ways. Participants design and develop their project based on needs, tasks and responsibilities relevant to their workplaces. In the dialogue between the participants, their home institution and the programme coordinators, participants are expected to deepen their understanding of the different dimensions of ESD, adapting recent experiences in workplaces using new concepts presented in the training programmes, to the specific conditions in the home organisation. This reflexive model of training has been shown to involve the learners in ongoing *processes of change and reflexive re-orientation of practice,* sustaining the impact of the training beyond the individual and beyond the time of the training.

Methodology - The course takes nine months and runs through five phases:
Phase one consists of an institutional audit and national workshop during which participants undertake an institutional audit that clarifies their institution's engagement with ESD in formal education.

Phase two is the Swedish component during which participants spend three weeks in Sweden interacting with ESD practitioners from Southern Africa, Asia and Scandinavia.

Phase three is an institution based component spent back at their work places during which participants and colleagues share insights gained from the time in Sweden and further develop the *Change Project.*

Phase four is the regional component which takes place at the SADC REEP centre in South Africa. Participants bring a co-participant to develop an implementation strategy for their *Change Project.*

Phase five is implementation and evaluation and takes place at their work places.

Outcomes - Through the ITP training, formal education institutions and institutions of higher learning in East and Southern Africa have transformed their curriculum, greened their curriculum, improved the teaching instructions from *chalk and talk* to more participatory and problem solving approaches. The ITP intervention challenged pedagogical solitude in several ways. It enabled participants to value each other's professional knowledge, experience and efforts, making it possible to build the reciprocal trust necessary for cooperation. It facilitated the emergence of a shared understanding of high-quality education and

of a shared identity as professionals which enabled convergence on important issues or commitment to common projects. It accelerated the diffusion of eminent teaching and learning innovations into the school and higher education systems. Finally it propelled collegial and institutional learning with respect to teaching and learning, enabling the institutional competence to accomplish their potential.

CASE STUDY 2
ENABLING SOCIAL LEARNING AS A RESPONSE TO ENVIRONMENTAL ISSUES THROUGH TEACHING OF LOCALISED CURRICULUM IN ZAMBIAN PRIMARY SCHOOLS (by Imakando C. Sinyama)

The introduction of Localised Curriculum in the Zambian education system has seen a shift in the teaching process in the classroom. This learning area aims to support learners to develop knowledge, skills, positive attitudes and values within a locality for individual and community sustainable development (MoE, *Localised Curriculum Manual*, 2005). Assumptions of the localised curriculum include increased relevance of education, and local meaning making. In one school, the localised curriculum's ESD learning processes were studied in detail to fully understand the process of localised meaning making, with emphasis on the teachers' intentionality and roles; learners' responses and the role of parents and members of the local community in the construction of knowledge and learning. This study was undertaken at Keemba Basic School in Southern Province of Zambia, and was undertaken under the umbrella of the WWF Zambia's Children for Environment Project.

In reviewing the learning processes, an analytical methodology using social learning theory was used, which describes processes of orientation, (self) awareness raising, deframing or deconstructing, co–creating, experimenting/applying, and reviewing (Wals, 2007). This was used to observe the nature of the ESD learning processes that emerge within a localised curriculum framework. Wals (2007) argues that we need to engage with such social learning processes in ESD if we are to enable learners to engage with complexity, and with the nature of sustainability challenges. With this in mind, the key research question was *how does localised curriculum enable social learning in response to environmental issues in Zambia?* A number of lessons were observed and analysed using this social learning framework.

Outcomes - Teaching localised curriculum allowed for contextualisation and integration of environment and natural resource management issues.

Localising the curriculum contributed to curriculum relevancy: teaching localised curriculum helped learners, teachers and community to develop concern for quality of life and contributed to an understanding of sustainable development.

Localised curriculum allowed for frame awareness, frame deconstruction and reframing to take place: this allowed teachers to use methods which promoted active pupil participation and interaction, encouraging learners to be reflexive thinkers rather than just using rote memory.

Participation of teachers, community and learners in the implementation of the localised curriculum: the involvement of community members to teach topics of the localised curriculum was useful and articulated processes of inter–epistemological dialogue between traditional or everyday and scientific or institutional knowledge.

The localised curriculum implementation involved various roles and was influenced by various factors. Of key interest to this study was the fact that neither parents, learners nor teachers saw the localised curriculum as an opportunity for problem solving, but rather emphasised the learning of practical life skills relevant to the community. This differed from the curriculum manuals, and reduced environmental education potential and also social learning opportunities. It was found that *if* teachers had asked more *critical questions,* the learning could have been expanded from a focus on practical skills in local context, to wider, more critical forms of ESD learning.

CASE STUDY 3
LOCAL COMMUNITY CONTRIBUTIONS TO THE TRANSFORMATION OF MALAWI COLLEGE OF FISHERIES CURRICULUM
(by Dick Daffu K. Kachilonda)

Fish is the cheapest source of animal protein and accounts for 70% of consumed animal protein in Malawian diets. It provides direct and indirect employment to over 300,000 people living along the shores, who mostly depend on fish related businesses. Since 1987, fish catches in Malawi fisheries have been declining. The situation has been aggravated further by high population growth and the resultant increase in fish demand (Turner, 1996). In early 2000, the Malawi Fisheries College undertook a curriculum review process as it was found that the curriculum was ineffective in training extension officers to deal with the complexities of managing fisheries and fishers' activities on the lake. The curriculum was viewed as being outdated, and had been developed by external consultants who failed to consult the local fishing community about their experience and knowledge of fisheries management practices. It was also heavily dominated by traditional scientific knowledge and had a technical knowledge bias. Thus a study aimed to transform the Malawi College of Fisheries Curriculum was launched, to make it more responsive to the needs of society, by incorporating indigenous knowledge and skills (Kachilonda, 2003).

An extended consultation with various stakeholders (fishing communities, learners, lecturers and business people) was launched, and careful note was taken of their contributions as well as the knowledge that they shared about fisheries management practices and issues. These contributions were intended to make the existing Malawi College of Fisheries curriculum responsive to societal needs.

Outcomes - Fishing communities raised many issues, including the decline of fish stocks as a key concern and pointed out that it was as a result of poor extension services. They expressed the need to get involved in the processes of finding out what needs to be taught in the fisheries college as one way of making sure that some of the local skills and experiences acquired over years of fishing are incorporated in the curriculum. The study revealed that the local communities seek practical explanations for the problems affecting their livelihoods, and that working with the college would help to address most of their concerns. It was evident from the study that the local knowledge highlighted by the community members was practically oriented and did not place much value on the technical knowledge taught in the college, but rather required better understanding of *why things happen the way they do* (socially critical and societal knowledge). It was found that the local community members have knowledge that is practical, real and that they base their understanding on historical perspective in order to understand why things have changed in a particular way. This curriculum change work at the Malawi College of Fisheries further demonstrates that a more consultative, participatory, responsive and reflexive curriculum review process takes into consideration both scientific and local knowledge in fisheries management, thereby building a sense of ownership and responsibility amongst stakeholders working on

sustainable fisheries management. This provided a wider range of ESD learning processes and experiences for the new extension officers in training (technical knowledge experiences; practical knowledge experiences; and socially critical or societal knowledge and experiences), and they were more able to engage with the context of fisheries management; improving the quality, relevance and efficacy of their education.

In Tanzania, Hogan (2008) drew on aspects of learning as a connection when researching on contextualising formal education in a school in the Rufiji Wetlands. In one of her findings, she states that contextualisation necessitated a change in pedagogy to more learner-centred, discovery methods. The teachers participating in this project also made learning support materials for active learning. This was not a common activity in Tanzanian government primary schools (Mrutu, Ponera & Nkumbi, 2005). For the first time, these teachers used the outdoor and the local community as educational resources.

Learning as connection has teaching implications. It raises questions as to how teachers can make connections and how learners might make connections between school knowledge and everyday/indigenous knowledge. In the localisation of curriculum as illustrated in the case studies above, caution must be taken to avoid over-localisation, which may lead to graduates failing to rise to the challenges of global market, or to understand the complex and interconnected nature of global issues and the trans-boundaried structural features of globalisation. This is true for higher education institutions which are under pressure to produce graduates who are globally marketable and who have the breadth of knowledge experience necessary to traverse both local and global challenges, as suggested by ADEA (2009). The argument put forward in all of the cases above, is not to localise knowledge and confine education to engagement with local or indigenous knowledge only, but rather to establish *inter-epistemological dialogue* or dialogues between different forms of knowledge in and through ESD learning processes. This allows learners to engage with a wider range of 'ways of knowing', and allows the familiar experiential and cultural forms of knowledge to enter the education system, while also allowing the learning of 'strange' or unfamiliar forms of knowledge and experience.

The case studies above demonstrate that local people living in rural areas have contextual knowledge, which they have generated over years of experience and association with nature in their locality. This knowledge has value in education today, and allows for the emergence of 'learning as connection', where different forms of knowledge and ways of knowing can be 'brought closer together'. Before colonialisation and western education in most parts of the African continent, natural resources were under the custodianship of local traditional leaders. Chiefs controlled and imposed utilisation restrictions for the common good of community members. Fish communities in major fisheries of the continent imposed a fishing ban (Banda, 1998) at certain times of the year. These were usually during the breeding seasons of indigenous fish. During the period of the ban, no one was allowed to fish (WWF ZEP, 1999). This practice was sustainable in the long term and fish catches were seen to improve every time the ban was lifted. In working with the notion of learning as a connection, the challenge is of whose knowledge matters and how far we can make the connections between school knowledge and indigenous and local forms of knowledge. What does this mean for actual teaching and assessment of learning, when we consider a situation where indigenous knowledge and conventional school knowledge are integrated? It must be noted here too that simple oppositions between western and indigenous knowledge should not be used to create or reflect 'essentialist' ways of thinking about knowledge. Within indigenous knowledge one finds resonance with 'western ways of knowing' and vice versa.

Reporting on a study that analysed teachers' curriculum practices and ESD learning processes, Lotz-Sistika and Schudel (2007) report that a number of the lessons developed by teachers showed that the teachers and learners appear to value community input for understanding the relationship between human rights, inclusivity, social justice and a healthy environment; and that in a number of the cases the teachers drew on members of

the community, or asked learners to interview community members. Noted however was that while community knowledge is being valued, there does not seem to be enough value placed on the empirical nature of science and mathematics to provide a closer picture of reality. They report for example that learners were not really required to interpret the bar graph or the invertebrate study or use pH values in establishing water quality, indicating that the teachers or the learners (or both) were not cognisant of the potential of using these ways of scientific knowing to develop a more in-depth perspective of the issues at hand.

The above case studies demonstrate that thinking about ESD learning processes as 'making connections' between different knowledge forms, has potential to enhance the quality and relevance of what is being taught; but that it requires attention to quality of both local knowledge and scientific knowledge. Significantly, the case studies all show that local people show openness towards having their own knowledge in the learning curriculum; and it creates a more inclusive epistemological framework for education and learning; while it strengthens parental involvement in education, which has been identified as an important feature of enhancing educational quality (UNESCO, 2005).

The case studies also show that in this learning process all participants have their own different roles to play. The elderly community members are often the custodians of indigenous knowledge and skills needed for localisation; and they may bring these to the education setting. The teacher's role is to facilitate the process of eliciting local knowledge that can be incorporated in the curriculum as well as to broaden learners experiences beyond the 'everyday' knowledge practices and experiences of their communities. They also help the learners to make the connection between what they have learnt at home and in their communities and what is learned in schools.

PROPOSITION 2: ESD INVOLVES CRITICAL THINKING, ACTION COMPETENCE, AGENCY AND DEVELOPING CAPABILITIES

The notions of critical thinking, capabilities (making choices about what is valuable to be and do), action competence (abilities to act) and agency (evidence of actions) are intertwined with power relations and with the struggles of 'how to bring out what is within us'. They are also linked to language and how we express ourselves, what is said and how it is said. They are visible in actions, and what is done by whom and why. Capabilities represent those things that people value having, being and doing. For example people might value being educated; or people might value being healthy; or people might value aspects of their communal or cultural lives. Few education systems in Africa allow children and parents the time and opportunity to fully conceptualise and express what they value being and doing, and to work through what this means for education. Instead, it is simply

assumed that what education offers is what is to be valued in society.

Walker (2005), drawing on the work of Sen (1999), defines the capability approach as one that is based on the notion of life and living as a combination of various valued 'doings' and 'beings', with quality of life to be assessed in terms of our capability to achieve valuable functionings. ESD learning processes engage learners in questions of valuing, and of values, and can therefore help to develop capabilities, and valuable functionings. Walker (2005) argues that education in itself is a basic capability, that affects the development and expansion of other capabilities. For example education can expand a child's ability to swim or the ability to add up numbers correctly. Acquiring basic numeracy skills makes it possible for the child to develop complex mathematical abilities; which in turn allows the child to participate in a wider variety of social practices. However, children can also deliberate what they value being and doing, and ESD learning processes allow children to engage in discussions about normative issues in society; for

example, why it may be important to recycle waste, or why resources ought to be shared equitably amongst people, and so forth. This helps learners to develop their abilities to choose what constitutes 'valued beings and doings' at a broader level.

Action competence is defined as the ability to act (Jensen & Schnack, 1997). It develops "… learners' abilities to act at the personal and at the societal level …" (ibid., 6). Jensen and Schnack (1997) further argue that education is not about simple behaviour modification without understanding, but about creating a democratic process of participation in which students decide for themselves what action they will take (cited in Eames et al., 2006). The action competence approach points to democratic, participatory and action–orientated teaching and learning that can help students develop their ability, motivation and desire to play an active role in finding democratic solutions to problems and issues connected to sustainability development (Finn & Karsfen, 2010, p.5).

Human agency, according to Walker (2005), is having the capacity to make informed and reflexive choices. She explains further that educational action research is potentially a powerful tool in the capability approach, because it requires us to evaluate how we are 'doing well-being' and 'doing fairness' in education (ibid. p.109). This necessitates critical thinking skills.

A review of the ESD learning process literature shows strong support for ESD practices taking place in different contexts in sub Saharan Africa, which draw on the notions inherent in the capability approach, action competence and agency. These include:

Undertaking local environmental action projects,

Development and implementing school environmental policies and management plans through consultative processes and communities of practice,

Involving learners in action competence processes to strengthen their participation in decision making,

Research (including action research projects),

Greening schools and communities (including permaculture projects),

Celebration of commemorative days (e.g. world wetlands day, world environment day, HIV/AIDS day, youth day, human rights day etc), and

Supporting school clubs and competitions.

A study involving 14 Southern African countries showed that there is wide support among ESD practitioners in Southern Africa for the use of participatory, active and learner-centred approaches to teaching and learning. The rationale behind the use of participatory approaches in ESD initiatives is that they contribute to capacity building and ownership of ESD initiatives among stakeholders, and can lead to local action taking. They also encourage the use of methods which ensure effective implementation of ESD programmes and objectives; and contribute to changes in educational practice, such as group work, research projects, experiential learning, presentations or theatre. However, while this is the case, these approaches to ESD learning processes are hampered by shortages of suitable teaching and learning materials, low levels of literacy among participants, difficulties in accessing relevant information and different interpretation of 'participatory' and 'active' learning among participants (Lotz-Sisitka, Olvitt, Gumede & Pesanayi, 2006). This is not only the case in Southern Africa, however, as Ndaruga (2003), writing from East Africa, reports that active learning pedagogies are critical for learner participation in ESD for improved wetland management; and Babikwa (2003) similarly writes (from Uganda) that deficient interpretation of educational concepts hamper the manner in which active critical approaches to learning can be developed and implemented in farmers' learning of sustainability practices. The Eco-Health Programme being developed in West Africa, also proposes and supports active, critical approaches to learning; and studies at the Kigali Institute of Technology in Rwanda demonstrate the value of such approaches to community empowerment and development (UNEP, 2008). In Cameroon, Anyonge (2007) has similarly argued for active, agency-centred approaches to environmental education in response to water-related issues.

Case studies 4, 5, and 6 provide insights into how ESD learning processes support and/or enable the development of critical thinking, capabilities, action competence and agency.

CASE STUDY 4
MOBILISING INTERPRETIVE CAPITAL FOR ESD LEARNING PROCESSES IN SCHOOLS (by Abel Barasa Atiti)

This case study shares 'ESD learning processes' that emerged from mobilising interpretive capital with teachers to develop school grounds for environmental learning in two Kenyan schools. It provides a practical foundation for sharing experiences on the development of interpretation resources and materials in order to enable ESD learning processes in schools. Framed within a participatory action research design, the study sought a critical examination of the relationship between the mobilising of interpretive capital and actual transformation of school grounds for ESD learning processes.

A spiral of self-reflective cycles of: planning a change; acting on the plan; reflecting on emerging learning processes; and then re-planning were initiated by teachers working with the National Museums of Kenya. Educators from five non-formal education organisations shared their skills and knowledge on environmental interpretation with teachers; and teachers and non-formal educators engaged together in development of interpretation resources and materials which could facilitate action learning, critical thinking and transformation of school grounds. This occurred during workshops, organisational visits and critical reviews of a sample of interpretive materials.

Outcomes - The results of the project shared in this case study focus on: the transformation of school grounds; improved environmental interpretation and education practice in the context of ESD; improved teacher professional competencies in material development; new interpretive materials in schools; and the establishment of partnerships for ESD learning processes. Through a teacher-centred approach, a school-based botanic garden and arboretum were developed in two different schools. A key outcome of the study was in the formulation of guidelines that may inform the development of interpretation resources and materials for ESD learning processes in schools. The guidelines support a development process that involve an open-ended framework in which teachers in consultation with more culturally knowledgeable peers, choose and plan their own themes and approaches, drawing on available interpretive capital. This allowed for learners to develop plant-based knowledge, critical thinking, and at the same time transformed their school grounds, which in turn enhanced the quality of their learning experiences in school, and their opportunities for improving the quality of biology and science education. It also allowed for integrating indigenous and scientific knowledge of plant resources; and cultural values and interpretations of plant uses in Kenyan society.

CASE STUDY 5
PROBLEM BASED LEARNING IN THE TEACHING OF AGRICULTURE AT LESOTHO COLLEGE OF EDUCATION (by Lintle Khitšane)

The Lesotho College of Education is a training institute for both primary and secondary teachers. The college provides a three-year training programme. However, teaching in college does not adequately address the issues of ESD. A *Change Project* was developed to change the way of teaching/learning in agriculture at the Lesotho College of Education. It emphasised outdoor learning methodologies - with the major focus on problem solving. Soil erosion in the college campus was identified as an environmental issue, and students were asked to investigate its root causes, extent and effect as well as provide solutions to the problem.

Students worked in ten groups of ten members each. Each group carried out an audit on the status of soil erosion around the college campus. A worksheet was developed to guide to the audit. During the course of the project, tutorials and consultations were held for each team. Facilitators guided them with their deliberations, suggested knowledge resources and assisted in teamwork, which in some cases was a major problem.

Outcomes - The project was a great success because students were able to work together as a team to identify different types of soil erosion around the college. During group presentations, many pertinent issues around the best method of soil erosion control were raised. Students showed confidence on the subject. They were able to confidently suggest solutions to the threats posed by soil erosion. They developed their competences and took action to solve the problem at hand. Unlike in traditional instruction, where knowledge is expounded by an instructor, the project actively engaged the students in constructing knowledge in with the teachers both support and participate. They drew on their indigenous knowledge to make sense of the types and causes of erosion identified and plan for reclamation. New knowledge was created, while previous knowledge was critically analysed and questioned. Students were also exposed to a variety of teaching/learning methods that they can use during their own teaching. This process helped the students to develop critical thinking, as they had to make assessments and decisions on what needed to be done in response to the soil erosion problems. It also enhanced their action competence, as they were able to formulate visions of what could be the case, and then decide on possible solutions and implement those that they thought were most feasible and relevant, thus also enhancing their capacities for making choices.

CASE STUDY 6
MOBILISING OPPORTUNITIES FOR SOCIAL CHANGE THROUGH CURRICULUM INTERVENTIONS: A CASE OF HIV/AIDS AWARENESS AT PARIREWA HIGH SCHOOL, DOMBOSHAVA – ZIMBABWE.
(by Cecillia Mukundu, Raviro Kasembe, Molliana Nyamukunda)

Considering the fact that Zimbabwe has one of the highest prevalence of HIV/AIDS in Sub-Saharan Africa, the authors developed a study to devise ways of helping teachers build competence and take action to effectively integrate HIV/AIDS education in the formal school curriculum, in a bid to reduce its negative impact on the quality of education of vulnerable youths. This was part of a broader initiative, where the ultimate goal was to create a socially sustainable community through capacity building for the risk perception and risk mitigation that sought to meet the special needs posed by HIV/AIDS. A case study approach was adopted in which Parirewa High School and the local growth point community of Bomboshava were purposively selected to work with researchers from the local university, in conceptualising and implementing possible responses and solutions to educational quality issues that emerged as a result of the HIV/AIDS pandemic's impact on the local society.

Outcomes - Teachers are equally burdened by the challenges posed by HIV/AIDS, and the general sentiment is that they require their needs to be met before they can address learner needs. Teachers lack knowledge of how to support children infected with HIV, or simply orphaned and vulnerable children. There is considerable stigmatisation around HIV – to the extent where teachers who teach children with HIV are also labeled HIV positive. Isolated reports indicate that children who are HIV positive are discriminated against when it comes to receiving a government scholarship for vulnerable children. There is a need for dialogue and education around issues of HIV/AIDS. The study argued that all members of the teaching and support staff have an important role to play when it comes to helping the school members to improve their attitudes towards those infected with HIV. HIV/AIDS cannot easily be taught as a single, stand-alone subject; but it can be mainstreamed by including it in the existing curriculum. The interventions developed were done through dialogue with teachers and with surrounding communities and through this dialogical approach, new solutions were developed to reduce stigmatisation, and to develop practical pedagogical solutions to the educational quality issues that had emerged. This involved critical thinking, and deliberation on suitable solutions.

Other examples of ESD learning processes that promote critical thinking, capabilities, action competence and agency in Africa include those of the Nile Basin Initiative (NBI), a partnership between riparian countries of the Nile River, namely: Burundi, Democratic Republic of Congo, Egypt, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, and Uganda. NBI, through the Nile Transboundary Environmental Action Project (NTEAP), embarked on projects to take action against trans-boundary waters and environmental challenges in the Nile River Basin. One of the ways in which NTEAP met this objective was to conduct environmental education and awareness activities throughout the Nile Basin countries. The table below (Table 2) shows some of the action-orientated activities undertaken by Nile Basin riparian states.

TABLE 2. ACTION ORIENTED ACTIVITIES UNDERTAKEN BY NILE BASIN RIPARIAN STATES

Country	Activities
Burundi	Delineation of parks, awareness workshops, removing of alien invasive weeds, journalist and folk dances' award
Congo	Competitions (football, media, poems), cleaning of two cities and awareness materials
Egypt	Competitions (drawing), awareness materials display and youth camps on three cities, a Nile cruise was peak of the celebrations
Ethiopia	Radio and TV debate, tree planting and awareness materials
Kenya	Competitions (poems and drawings), tree planting, display of awareness materials
Sudan	Tree planting, shore of River Nile cleaning and awareness materials
Tanzania	Competition (CBOs and schools), cleaning of Mwanza city and display of awareness materials

Source: Ketlhoilwe and Kidundo (2008)

Other examples emerge from work undertaken in a Schools and Sustainability professional development programme in South Africa that uses an active learning framework as guide for supporting active learning and action competence development (Lotz-Sisitka & Schudel, 2007) (see Figure 1 below). This active learning framework proposes the following important ESD learning processes: mobilising learners' prior knowledge and experience; identifying possible focus, risks or concerns that need to be investigated; seeking out new information on the issues or risks; undertaking enquiries; taking action and reporting on findings.

Figure 1. Active Learning Framework (O'Donoghue, 2001)
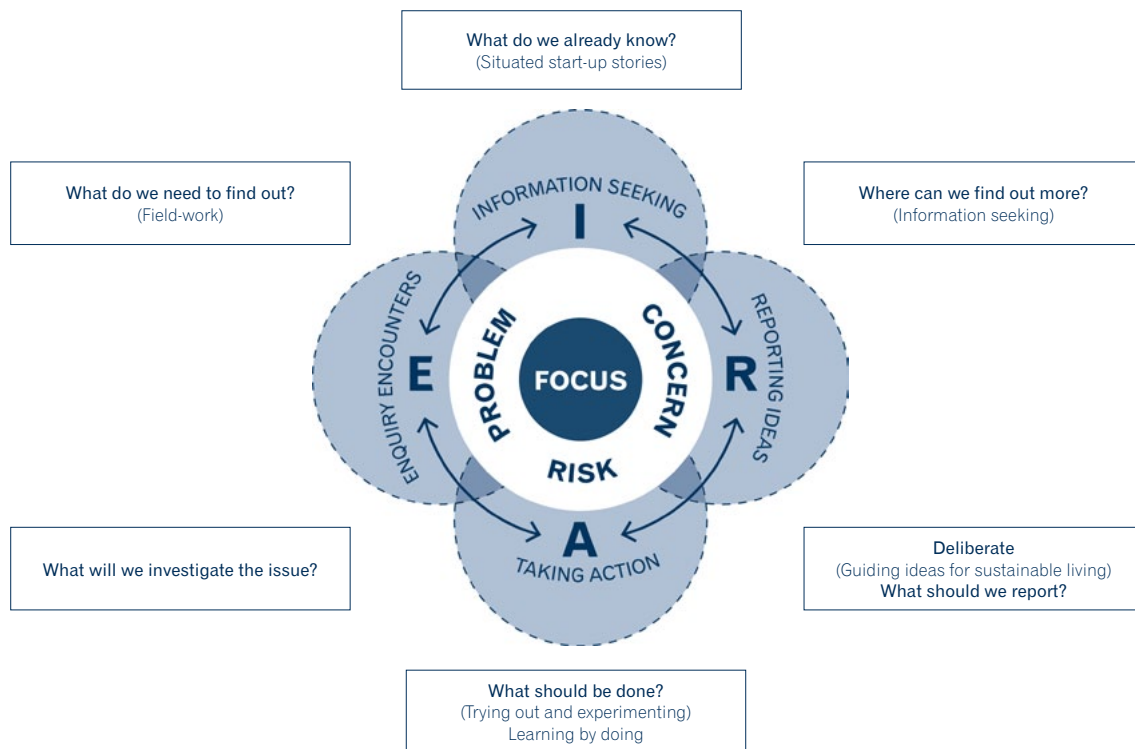
Using this pedagogical framework, many teachers have been supported to implement ESD learning processes that are action-centred, and that help to develop learners' agency (abilities to act) and their critical thinking skills. Research currently being undertaken by Schudel is showing how use of this framework can lead to transformative praxis in environmental education (Schudel, in press). A set of lesson plans developed by teachers, based on this framework (see Table 3) below, show how ESD lesson planning can help teachers to address formal curriculum requirements and the normative framework of the ESD curriculum in terms of classroom practice. In the South African context, the ESD curriculum involves an infusing or mainstreaming of the principles of healthy environment, social justice, inclusivity and human rights into all lessons. It also recognises the links between school and community.

TABLE 3. CASES OF ACTIVE LEARNING (AS REPORTED IN LOTZ-SISITKA & SCHUDEL, 2007, p.254)

Case 1	**Lesson:** Grade 5: Sanitation issues, particularly the bucket system, which poses health risks to learners. **Activity sequence:** Learners developed a mind-map of sanitation issues, making the link to toilets. Using a picture on cholera risks, learners discussed healthy sanitation facilities. Learners audited sanitation systems available to the different learners' families. Learners 'built' picture models of different sanitation options (different kinds of toilets). Learners researched (through asking questions in their communities) what good points and bad points are associated with each model. A text provided by the Department of Water Affairs on "Strengths and Weaknesses of different sanitation systems" was used to guide the discussion on the strengths and weaknesses of the different kinds of toilets.
Case 2	**Lesson:** Grade 1: Health and sanitation issues in the Makana township community, with the main concern being the bucket system and social inequality. **Activity sequence:** Learners visited a sewage plant. Learners' were encouraged to find out how water from flushing toilets is purified. Learners' walked around the community, and were asked to note flies in the areas where bucket system toilets were used. They interviewed parents and found that in the past the community used pit toilets. The class participated in a fund-raising project and raised money for toilet paper, as the learners had discovered (through their interviews and through the visit to the sewage plant) that newspaper should not be used, as it blocks the flush toilet systems. They participated in a community drama to raise awareness about infectious diseases that can be spread through the bucket system, and the importance of using toilet paper.
Case 3	**Lesson:** Grade 4: Wetland pollution **Activity sequence:** Learners completed a section on acids and bases in a science textbook. Learners then tested the wetland and found that it was acidic. They responded by writing letters to the municipality saying that the wetland was polluted by plastic and that wild animals also roam freely in the area. Their recommendation was that the municipality should fence the area.
Case 4	**Lesson:** Grade 3: Removal of alien invasive plants **Activity sequence:** Learners found information on alien and indigenous plants from a local museum. They developed a drama illustrating a conversation between an alien plant (prickly pear) and an indigenous plant (African potato). They discussed why the alien and indigenous plants were useful and debated the removal of alien invasive plants if they were economically useful to poor communities. The debate became more complex when they learned that the invasive plant (the prickly pear) which provided a source of food and income for local people, also threatened the indigenous plant (the African potato) which is used to boost the immune system of AIDS patients.

Case 5	**Lesson:** Grade 5: Water pollution **Activity sequence:** Learners were introduced to the meaning of heritage, and asked communities to identify local heritage sites. They visited a local river with a member of the community's older generation, who talked to them about the importance of the river for rituals. The river also has healing value, and socio-economic value (people use the reeds to make mats). Learners developed an action plan for cleaning up the river and wrote to the municipality to ask for a monument to be built near the river.
Case 6	**Lesson:** Grade 8: Wetland degradation **Activity sequence:** Learners undertake a wetland/pond life audit to identify species (plants and animals). Learners then collected litter near the wetland, and developed a bar graph showing different incidences of litter. They wrote to the municipality and received a response, inviting them to participate in a town clean-up campaign.

In reflecting on how this active learning approach works in practice, Lotz-Sisitka and Schudel (2007, p. 253) report on various areas where ESD learning processes can be enhanced and deepened, all of which have implications for teacher education. Reflections on the lessons indicate that in each case, the focus of the policy interpretation was on gaining and understanding of the issue/risks, with less focus on deeper, more critical analysis of the issues. Causes an consequences were not probed, nor were relationships between a healthy environment and social justice issues explicitly probed (i.e. the politics of sanitation in the local context). There was generally a heavy reliance on learners obtaining information from community members, with little checking on the accuracy or validity of the information. Engaging in issues of local concern, and pedagogical changes (i.e. use of different kinds of activities) are perhaps the most striking features of the lesson sequences. Available information used by the teachers was general in nature, and not necessarily always appropriate to the context.

This section provided literature and case studies that give insights into ESD learning processes that enable the development of critical thinking, capabilities, action competence and agency. The question that remains hanging is 'are we doing enough?' What in the educational setting is constraining practitioners' abilities to turn their current experience and situation (their existing functions and what they are doing now) into capabilities (what they value and do)? What is

constraining their capacity for critical thinking and action competence (their ability to learn how to act and do new, valuable things) and what is constraining their abilities to act and do new, more sustainable things? These are important educational questions, and have implications for how quality is defined and interpreted in Africa.

PROPOSITION 3: ESD LEARNING PROCESSES HELP TO MAKE EDUCATION RELEVANT

In discussing education relevancy, Hawes and Stephen (1990) mention that education must be rooted in a society and a culture which learners can comprehend. An alien education is both unproductive and psychologically disturbing, often leading to a dangerous form of half learning. Children can answer questions on the content yet do not fully understand what they are being asked or why they are answering, because it has little connection with their daily lives and experiences. Along similar lines, Shava (2005, p. 80) argues that:

Formal education usually suffers the setback that it is out of context with the learners' 'lived environment'. This set-up creates two separate worldviews for the learner: the school world and the world in which they live. Indigenous knowledge should be integrated into mainstream education to enrich the learning environment and to put learning processes into context with the learners' living environment.

Chikunda and Shoko (2009), while researching the relevance and quality of the VaRemba initiation school curriculum and its impact on formal schooling in a rural district in Zimbabwe, concluded that education would be considered to be relevant and of good quality if it develops learners' cognitive skills, as well as their values and attitudes in a way that contributes to a wider re-orientation of society towards equity and sustainability.

Hogan (2008) consulted with parents, learners, villagers and teachers to identify ways of contextualising and localising a module of the formal curriculum in Tanzania. Her research found that allowing local issues such as the control of forest logging, or the marketing of mushrooms into formal education curriculum provided openings for students to "... get the 'insight and knowledge' and 'social skills' needed for their engagement in 'concrete action' with their communities for the environment...." (ibid., p.55). Hogan's study provides useful findings on what happens when a curriculum is localised or contextualised. The issue of curriculum contextualisation and 'relevance' is also demonstrated through an example of learners' experiences of 'foreign concepts' in school, when ESD learning processes could so easily make these same concepts significantly more visible and accessible to learners. Lotz-Sisitka (2009) documents a case in which a child and his entire class failed to understand the scientific concepts of *mutualism and commensualism,* when asked to do so without substantive mediation and simple forms of scaffolding that demonstrated that the concepts in fact were obvious in the local fields where children played; and could be observed through watching birds benefit from the movement of cows' feet and from the lichen growing on trees.

Farrington (2008) also writes about the benefits and relevance of place-based education in ESD, noting that in Africa, little has been done to include youth in making decisions at local, regional and global levels. Through ESD learning process activities, in which a group of youth used mapping, photographs, transect walks and dialogue to engage in various expressions of their engagement with local environments, Farrington (2008) identifies that youth have: multiple and multi-layered identifications with place which are influenced by their mode of transport (i.e. walking in this instance); environmental concerns (linked to the

well-being of the inhabitants of their communities in this instance); responsibilities; peer interactions and desires for solitude or company; and cultural experiences of place. Farrington(2008, p.98) then notes that they engage in locally constituted "place making" actions that are reliant on safety and trust and other contingent factors; that youth had changing (sometimes paradoxical but not unreconcilable) attachments to place influenced by the hybrid intersection of global, urban and capital aspirations and fashions; they also possess attachments to local social and physical environments; and they have growing freedoms of choice. Farrington reflects that "... the ease with which the young adults were able to maintain multiple identifications within global cultures (which stress change, opportunity and flexibility) and local cultures (which offer security and stability), appeared relatively effortless" (2008, p.200).

In another study probing relevance and ESD learning processes, Hoffmann (2005) studied the way in which auditing activities were used in ESD learning processes to explore their local contexts and investigate environmental risks in or near their schools and communities. In observing how environmental auditing practices take place in various teaching and learning contexts involving teachers and youth, she distinguishes different types of auditing practices which include: a) impression-based audits which rely on knowledge construction of environmental issues based on the (inter)subjective impressions of youth and teachers; b) evidence-generating audits which were designed to construct knowledge of environmental issues through meaning making based on empirical-experiential data collection, using methods such as counting, measuring, describing, categorising etc.; and c) actualising audits which were oriented towards making the invisible effects of a phenomena (e.g. pollution) more visible through methods that actualised those effects (e.g. science tests that make coliform bacteria visible) (2005, p.139). Her research showed that different auditing practices had different values for different purposes, and that the quality of their use was, while relevant, at times impeded by naïve interpretations of constructivism, and the sometimes paradoxical feature that moral impulses of teachers and youth overshadow in-depth examination of issues and lead to superficial and incomplete accounts of sustainability issues and risks.

These studies, and their emphasis on relevance, allow for an engagement with hybrid influences of the global and the local. Farrington (2008) argues that learners' identifications with contexts and places are socially situated and include influences of global media and ideologies, but are simultaneously "… grounded in a general sense by their social and embodied interactions within their communities, families and peer groups." (2008, p.183). As such, she argues that youth in South Africa are "… not the passive victims of the structural forces of globalisation, but are actively engaged in the world and with the circumstances and conditions that surround them" (2008, p. 183, citing Strelitz, 2002). She sees this as 'sitting well' with the "… shifts that are being made within research approaches towards greater acknowledgement of people in their social contexts", and she notes further that "The development of participatory processes involving the youth is crucial for a smoother transition to their inclusion as responsible citizens for the environment in future" (2008, p.202); and that such approaches help to make education more relevant and interesting for learners, as they facilitate a positive to and fro movement between local and global contexts.

Case studies 7, 8, and 9 illustrate the issue of education relevance further. Agbedahin (2012) (Case study 7) uses her research knowledge and skills to solve a problem in food wastage (consumerism) in the dining halls at a university in South Africa. Case studies 8 and 9 demonstrate the government response in Egypt and Ethiopia to environmental and ecological degradation by developing policies and establishing a department to deal with a particular issue; and integrating these issues into the educational practices in formal and non-formal educational contexts. In all cases, the underlying principle is how education becomes relevant to the needs of society.

CASE STUDY 7
REDUCTION OF FOOD WASTE IN UNIVERSITY DINING HALLS
(by Adesuwa Vanessa Agbedahin)

This case study looks at ESD learning processes involved in reduction of food waste that is generated daily from the 12 dining-halls in a university in South Africa. The Food Services Unit of the university provides in-house food services to the majority of students who hail from about 50 countries around the world, who reside in 52 residences within the university campus. The focus of the project was to carry out an audit of the food economy and generate data in order to understand the underlying factors responsible for the enormous, persistent food waste production. The purpose of this initial analysis process was to identify opportunities for learning and change, and to find ways of responding to food waste through ESD learning processes.

To engage with the issue, the masters research project adopted change-oriented learning theory frameworks known as Cultural Historical Activity Theory and Expansive Learning Theory (after Engeström, 2000) and investigated how ESD learning processes for reduced food wastage could be established in a case study of one dining hall (to develop a model of process for engaging other dining halls). Documents and resource materials such as posters, notices, hall rules booklets, job profiles and minutes of meetings were analysed. Various meetings and in-depth interview discussions were held with key stakeholders; such as the manager of the Food Services, two caterers, two cooks, two servery attendants and two kitchen attendants. The project also involved eight focus group discussions with students from the eight residences that use the dining-hall, including one with their food representatives. Observations of the dining hall activities were done continuously over a period of one month, and notes and photographs were taken. All of this information provided useful insight into what was happening with the food economy, how food was being wasted, and why. Once this was done, an effort was made to understand the structural contradictions that were leading to the food waste problem, and this was shared with stakeholders using a strategy called 'change laboratory workshops'. These workshops provide a space where stakeholders met to deliberate the phenomenon and to find solutions and decide what course of action to follow.

Outcomes – The project helped participants to begin to think systematically and reflexively about the effect of their routine activities. They deemed it timely to support the objectives of the project, as they believed it could propel change in response to a situation that they knew was problematic, but which had just become accepted as 'normalised practice'. All participants admitted to the prevalence of food wastage in the dining-halls and most of them acknowledged it as unethical and unsustainable, but alterable if addressed in an effective way. There was a consensus as to the need for change in practices, but to enact a feasible change remained a challenge, because of institutional structure and mechanisms. The project created much more than mere awareness, but acquired an institutional obligation to find ways of ensuring a 'more' sustainable food economy, food resource management and food waste reduction. These were built around deliberation on multifaceted contradictions that were grouped into nine related issues in 'Change Laboratory' workshops. The participants jointly agreed on these contradictions, further analysed and prioritised them in the order of importance and degree of easiness to resolve. They started developing possible and feasible ways of address-ing the issues. Stakeholders co-created new model solutions, apportioned roles, as well as developed action plans to implement the solutions. Participants learnt about their actions, roles and responsibilities, which seemed negligible, but had great impact to either enable or disable sustainability. It was however a challenge for participants to unanimously agree on the most important contradictions on which to commence action and to propose feasible solutions, because of the complexity of the issues uncovered. A decision was made to 'start small', with feasible actions that could be implemented, thus kick-starting a process of ongoing change-oriented learning involving all stakeholders, who formerly did not interact much with one another. This story shows that change-oriented learning in ESD requires engagement and involvement with complex issues and a range of stakeholders involved in a phenomenon, but such engagement can greatly enhance the relevance and efficacy of learning efforts in society (i.e. it vastly improved on the use of posters only to deal with the food waste problem in the residences).

CASE STUDY 8
EGYPT (ADAPTED FROM THE NILE BASIN ENVIRONMENTAL EDUCATION AND AWARENESS BEST PRACTICES IN THE NILE BASIN)

In light of Egypt's strategy to address population and environmental issues, the Ministry of Education has established the General Department for Environmental and Population Education. Its main objective is to raise the environmental awareness of children and to support the development of skills for looking after the environment. The main objective of the environmental protection strategy is to spread awareness and identify environmental risks that affect the population.

Environmental education is included in the study syllabuses at different levels. During the first stage of primary education, environmental education is easily incorporated in the different educational materials, such as the Arabic language activities and scientific skills.

Outcomes – Environmental education has been integrated in the curriculum at different levels of the education system. During the first years of primary education, environmental education is incorporated in the learning support materials, such as the Arabic language and scientific skills. At an advanced level in both primary and high school, updated concepts are incorporated in various study materials in ways appropriate to the nature of the material and the age of students.

As a result of the establishment of the Ministry of Education, pioneer projects have emerged in schools and a national programme for schools promoting health education and environmental education, implemented by the General Department for Environmental and Population Education in cooperation with World Health Organisation. Environmental prizes were offered to 154 schools in the Cairo governorate (Northern, Eastern, Southern and Western regions) in cooperation with the Academy of Educational Development for the study year of 2003/2004. This programme supported a number of pioneering environmental projects that aimed at maintaining the environment and rationalising the use of available environmental resources.

CASE STUDY 9
"CONSERVATION FOR SURVIVAL PROGRAMME": THE EXPERIENCE OF THE ETHIOPIAN WILDLIFE AND NATURAL HISTORY SOCIETY
(by Gufla Fitiwe)

The Ethiopian Wildlife and Natural History Society (EWNHS) was legally established in 1966. It is a partner of BirdLife International. Currently, the Society is operating seven projects under two major programmes – *Environmental Education and Awareness Programme and the Biodiversity Conservation Programme,* within the framework of the *Conservation for Survival Programme.*

Schools and community nature clubs are selected and then consulted. Annual plans are developed according to the needs of the clubs. Technical and financial/material support is provided. The nature clubs carry out activities and compile reports. Following an evaluation, awards are given to the outstanding clubs. The club activities include: environmental education workshops; capacity building programmes; farmers' conservation initiatives; nursery establishments in schools and communities; production of school and community based environmental education magazines, newsletters, pamphlets, leaflets and brochures, among others.

Outcomes – The schools and farms environmental education and awareness programme amongst the Nature/Environmental Clubs has strengthened the understanding of biodiversity conservation in students, teachers and communities. Degraded areas are being rehabilitated. Toilet linked bio-gas plants have been established in selected schools and communities. Vegetables have been grown for consumption and income generation. Nurseries at environmental centres have raised trees and selected fruit for planting and sales. Soil erosion in the project areas has been minimised, and the vegetation cover is improved. Environmental education and awareness processes have increased the access of school communities to fresh vegetables and fruits. The working capacity of Environmental Centres (ECs) has been enhanced and the livelihood of adjacent dwellers has been improved.

Environmental Centre members have increased environmental awareness and proactive actions. They are involved in creating awareness through producing and distributing environmental newsletters, magazines, pamphlets and leaflets. The EC members also participate in the celebration of various environmental events. Adjacent dwellers are increasingly aware of the environmental situation and are willing to engage in rehabilitation activities.

There is an increased understanding that a relevant quality education system should contribute to socio-economic development and wider development goals such as equality; controlling the HIV/AIDS pandemic; social justice; and the democracy of any country. Relevance is critical for deliberating the applicability and value of knowledge; firstly, applicability for the subject (him/herself) and secondly, applicability to society. However, relevance also goes beyond applicability: it is involved in engaging learners in 'hybrid' processes such as navigating between the local and the global, and in deliberating what solutions are needed in future. SADC REEP (2002, p. 21) notes that environmental issues are complex, context specific and arise out of a range of different contexts. According to this principle, for any education to be relevant it must aim to respond to contextual needs of a given society. Learning theory in the 21st century is also increasingly acknowledging the importance of taking into account 'prior knowledge' and the disposition and needs of the learner, as well as the learners' identity formation, and the relationship between knowledge, learning and societal change (Chabay et al., 2011). There are interesting questions that can be further analysed and researched in relation to ESD learning processes and the enhancing of relevance in education, such as: are there contextual limits to applicability? What scope of contextuality is involved in establishing relevance? How do ESD issues, risks and contexts provide new frameworks for considering how relevance can be established in education? What role does knowledge and pedagogy play in establishing relevance?

PROPOSITION 4: IT IS POSSIBLE TO IMPROVE EDUCATIONAL QUALITY THROUGH ESD LEARNING PROCESSES

Quality education has its roots deep in the history of the United Nations and international declarations. The right to education is mentioned in the Universal Declaration of Human Rights and the Convention on the Rights of the Child. The importance of education is also mentioned in the World Declaration on Education for All, the Dakar Framework for Action, and the Millennium Development Goals. Education is crucial for the well-being of individuals, nations, and the world.

In 1990, the *World Declaration on Education for All* noted that the generally poor quality of education needed to be improved, and recommended that education be made both universally available and more relevant. The declaration also identified quality as a prerequisite for achieving the fundamental goal of equity. While the notion of quality was not fully developed, it was recognised that expanding access alone would be insufficient for education to contribute fully to the development of the individual and society. Emphasis was accordingly placed on assuring an increase in children's cognitive development by improving the quality of their education.

A decade later, the *Dakar Framework for Action* (2000) declared that access to quality education was the right of every child. It affirmed that quality was *'at the heart of education'* – a fundamental determinant of enrolment, retention and achievement. Its expanded definition of quality set out the desirable characteristics of learners (healthy, motivated, students); processes (competent teachers using active pedagogies); content (relevant curricula) and systems (good governance and equitable resource allocation). Although this established an agenda for achieving good education quality, it did not ascribe any relative weighting to the various dimensions identified; nor did it provide demonstrations on *how* this was to be achieved.

Since the first Education for All Conference at Jomtien in Thailand (1990), African governments – through the support of international donors – have invested billions of dollars in programmes and reforms designed to improve access to quality education. It is generally accepted that quality education is an effective means to fight poverty, build democracies, and foster peaceful societies. Quality education empowers individuals, gives them a 'voice', unlocks their potential, opens pathways to self-actualisation, and broadens perspectives to open minds to a pluralist world. There is no one definition, list of criteria, a definitive curriculum, or list of topics for a quality education. Quality education is a dynamic concept that changes and evolves with time, and changes in the social, economic, and environmental contexts of place. It is often locally relevant and culturally appropriate and thus takes many forms around the world. There is no consensus among the different national stakeholders on what quality education is and what is prioritised to achieve it.

In many Sub-Saharan Africa countries, conceptualisation of what quality of education entails is informed by the international development community. For example, the Millennium Development Goal (MDG) on Universal Primary Education (UPE) led to a focus on providing basic education for all children. But the World Forum on EFA (UNESCO, 2000), held in Dakar in 2000, recognised that an increase in enrolment is important but not sufficient for socio-economic development. An expansion of the education system does not necessarily mean an increase in quality (UNESCO, 2004). The discourse on quality education has mainly focused on improvements in quality and retention; educational efficiency and the ability of learners to benefit from their educational opportunity; high drop-out and repetition rates; and internal efficiency of an education system.

Although education quality was mentioned at the 1990 EFA conference in Jomtien, the concept was not discussed in depth. Similarly, the educational targets which were set in the Millennium Development Goals (MDGs) were more specific with the quantitative aspects of educational policies than they were with education quality. The emphasis on broadening access to basic education in the wake of the Jomtein conference and the declaration of the MDGs, has contributed to impressive figures in the primary school enrolment in most countries. For example, despite a general increase in the population of primary school-aged children worldwide in 2006, the number of out of school children dropped from 103 million in 1999 to 73 million (UNESCO, 2008). Although Sub-Saharan Africa and western Asia are still lagging behind the rest of the world in terms of universal basic education, this target is seen by many as one of United Nation's best successes stories (Barrett, 2009).

The main focus of ESD is on how education can contribute to sustainable development and a sustainable future. Without close attention to the acquisition of literacy and numeracy of sufficient quality, societies are unlikely to achieve sustainability in a modernising and globalising world. ESD provides a real-life context for the learning of literacy and numeracy skills. With its focus on culture, ESD also emphasises education-community links, using of local and indigenous knowledge in learning and connections with the local cultures and languages in

the learning process, as has been demonstrated by the literature and case studies in this report.

Quality education is understood differently in different countries in Sub-Saharan Africa. This paper draws on three conceptions of quality education. The first two were identified by Barrett, Chawla-Duggan, Lowe, Nikel and Ukpo (2006). These were based on major international studies such as the UNESCO Education for All Global Monitoring Reports (www.unesco.org). The third conception of quality is drawn from the Southern African region based on research and educators networks under the aegis of SADC Regional Environmental Education Programme; and it is also being developed by other researchers who have been engaged in the EdQual research project (Tikly et al., 2010). These are:

An efficiency/mastery discourse of education quality. This discourse seeks out mastery, efficiency and learner achievement and performance against set standards and expectations as measure of quality.

....

An inclusivity/participatory discourse of educational quality. This discourse seeks out inclusion in the education system as its measure of quality – for example, if girls are included in a school system, or if learners' views are included in pedagogical processes, the quality of the system is seen to be higher or better (through learner-centred approaches, the quality of the education is seen to be improved).

....

A concept of quality that favours or emphasises the 'socio-cultural' or the processes of meaning making that occur at the interface of existing experience and context and more abstract forms of representation most used in the symbolic practices in schools – to put it more simply, the meaning that occurs at the interface between context and concept. This is being expanded to include the notions of well-being and capabilities (Tikly et al., 2010), which is inclusive of a **social justice** discourse on educational quality. It involves what Lotz-Sisitka (2008) identified as 'learning as connection', as discussed in this paper.

Lotz-Sisitka (2008) worked with the three conceptions to 're-frame' education quality, as shown in the diagram below:

RE-FRAMING EDUCATION QUALITY

Three intersecting traditions?

Efficiency / EconomicI

Inclusivity / Human Rights

Socio-cultural /
Social-ecological

Learning as successful
performance / mastery

Learning as
democratic process

Learning as connection
in/with communities, society and environments
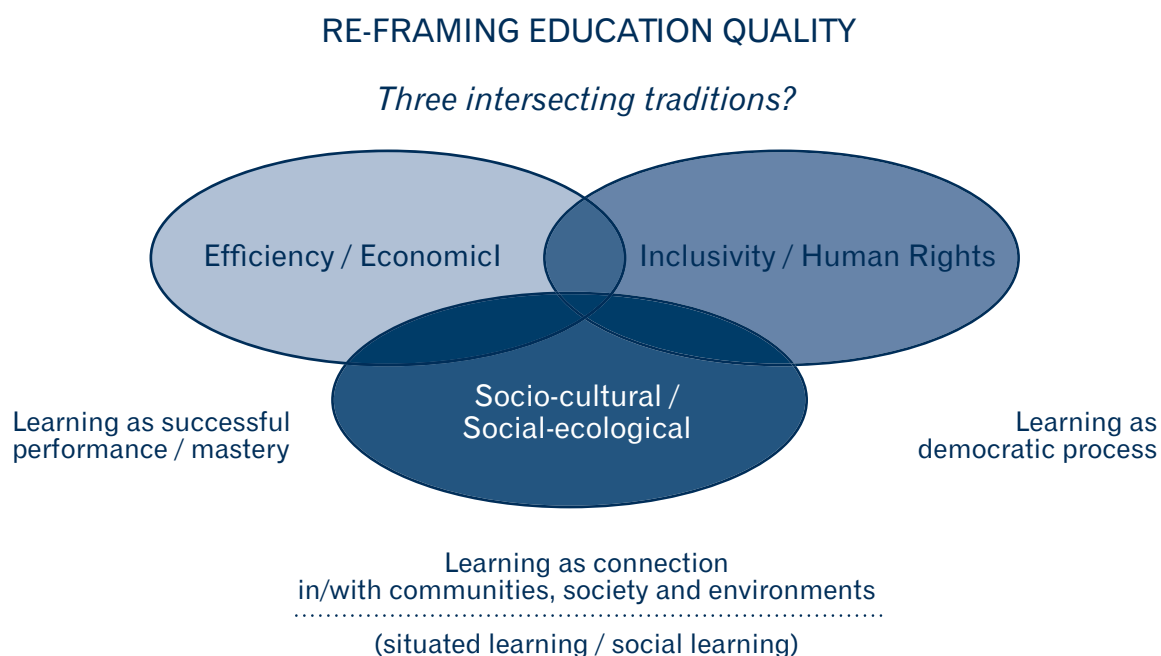
(situated learning / social learning)

Diagram 2. Three intersecting discourses of educational quality, which reflect both the acquisition, participation and relevance interests of ESD Learning Processes (Lotz-Sisitka, 2008; adapted from Barrett et al., 2006).

Applied practically to the observation of ESD learning processes, this framework demonstrates that there *are substantive improvements in the scope and nature of quality teaching and learning practices in the schools observed.* While these are few, and the research is still 'small scale' it *is* possible to identify two observation instruments that have been tested, which can be further developed for monitoring of ESD learning processes and their contribution to education quality and relevance. Silo's (2011) research produced a framework for observing the intersection of learner participation and action competence development in

and through ESD learning processes, shown in the table below.

She found that giving attention to dialogue and learner participation in the meaning-making and action-taking processes supported by ESD learning processes (in the case of her study the focus was on waste management practices), significantly improved the quality of the learning experience; the knowledge and cognitive abilities of the learners; and their social contributions and confidence. The model that she produced for observing such quality enhancement processes is included below in Table 4.

TABLE 4. MATRIX FOR OBSERVING FORMS OF PARTICIPATION AND MEDIATION
(ADAPTED FROM JENSEN, 2004 AND SILO, 2009)**.**

Mediation of WMAs Forms of participation	How the theme for participation in WMAs is selected (Object)	How the rules in the WMAs are set	Allocation of roles in the WMAs	Decisions on what actions are undertaken in WMAs
Teachers' decisions told clearly to learners	SEC identifies WMA issues that need attention	Teachers/ SEC set rules in response to Infusion Policy objectives	Teachers/ SEC based on Ministerial Directive	Teachers/SEC
Teachers inform All learners accept		Learners follow teacher rules	Learners assume allocated roles	Not negotiated with learners
Teachers inform Some learners accept Some learners reject	Some learners do not pick up litter or clean unless supervised		At a micro level learners allocate emselves roles	
Teachers inform All learners reject				
Teachers' suggestions Common decisions				
Learners' decisions told clearly to Teachers				
Learners inform Teachers accept				
Learners inform Teachers reject				
Learners' decisions told clearly to other learners				
Learners inform Some learners accept				
Learners inform Some learners reject				
Learners inform All learners accept				
Learners inform All learners reject				
Learners' suggestions Common decisions				

WMA = Waste Management Activities

SEC = School Environmental Committee

In another small-scale study, teachers use of new, preferred teaching methods for ESD learning processes was observed (Kalumba, 2011). It was found that through the use of these new, preferred teaching methods, the learners' experiences expanded, as did teachers' attention to the quality and relevance of what they were teaching. Teachers also became more conscious of the structural constraints impeding their abilities to use new teaching methods, but through working in communities of practice (together) teachers were able to navigate and self-reflexively decide on how they could improve the quality of their teaching practice. The model used to observe the expansion of educational quality (adapted from Nikel and Lowe, 2010) included observation items focusing on:

Efficiency of the teaching process – did the lesson go well and was waste of time etc. minimised?

Efficacy of the learning process – did learners learn what they needed to?

Sustainability – did the lesson promote sustainability?

Equity – were all learners respected and treated equally and equitably?

Relevance – was the lesson relevant to the learners, and to the curriculum requirements?

Reflexivity – was the teacher reflexive in the manner in which she implemented the lesson, and was there evidence of developing learners' reflexivity?

Socio-cultural factors – what social-cultural factors shaped the teaching and learning of the lesson?

Structural factors – what structural factors influenced the teaching of the lesson and how?

Kalumba's (2011) study found that few teachers consciously thought about being reflexive in their lessons, and they also seldom thought consciously about the socio-cultural dimensions or influences on the lessons they were teaching. The study found, however, that use of the observation instrument, with teachers, significantly enhanced their *perceptions of educational quality,* and enhanced their *reflexivity.*

To further argue for education quality, we draw on some selected case studies from sub Saharan Africa. These case studies demonstrates that quality issues are complex and cannot be narrowly seen from a single point of view; for example, it is not enough to focus on the efficiency/economic input such as provision of books, teachers, or to focus on inclusivity and human rights (as illustrated in case study 10) – but one needs to include socio-cultural aspects such as history, context and meaning-making.

CASE STUDY 10
QUALITY ISSUES IN SOUTH AFRICAN SCHOOLS
(by Eureta Rosenberg, excerpt from SAJEE Volume, 25)

The matriculation pass rate in South Africa, which measures learners' performance at the end of 12 years of schooling, has been a matter of concern for some time. 2007 was no exception, with only 65% of students passing the final examination and a mere 15% qualifying for university entry. But many South Africans were shocked to learn how much poorer the country's youth were performing compared to children elsewhere in Africa.

In 2000 the Southern and Eastern African Consortium for Monitoring Educational Quality (SACMEQ) tested Grade 6 learners in 14 countries. South Africa was placed ninth, behind neighbouring Mozambique. In the same year Grade 4 learners' scores for life skills put them second-last among 12 African countries participating in UNESCO-UNICEF's Monitoring Learning Achievement Project (DoE, 2000).

When universal access to schooling is first introduced, an initial drop in the quality can be expected, as the system adjusts to the higher number of students. This may explain why Mozambique (which produces a mere sixth of South Africa's GDP) fared better in the SACMEQ tests – only around 30% of Mozambican children indeed go to school, while in South Africa enrolment is nearly 100%. But universal access to schooling was introduced in South Africa in 1995, and while significant portions of the fiscal budget have been directed to education, along with an estimated R1 billion per annum of foreign aid and corporate social investments (Taylor, Muller & Vinjevold, 2003), results have not improved in the subsequent decade.

In the 2003 Trends in Mathematics and Science Study (TIMSS) (Reddy, 2006), South Africa was last among 30 developed and developing countries. In that year the Department of Education also reported that 61% of students cannot read or write at the age when they are expected to do so. In 2005, the Progress in International Reading Literacy (PIRLS) study (van Staden, 2000) tested literacy in children after four years in school across 40 countries; South Africa came last.

What lies behind these results? Firstly, there is a stark variation in learner performance among South African schools. An analysis of the 2000 SACMEQ data by Martin Gustafsson (2005) shows a bimodial curve in South African data: learner scores on various indices (including reading). South Africa was and still is a highly unequal society. Due to our apartheid history, in which unequal education played a major role, a majority of teachers were trained in the low-skills framework of what was termed Bantu Education, and many went into teaching while significantly under-qualified for the job. Today, learner under-achievement is particularly evidenced in:

Schools with a Bantu Education legacy;

Schools where teachers are still poorly qualified;

Schools with a high poverty index (Crouch & Mabonge, 1998, cited in Taylor, 2001)

Poverty at home influences a child's ability to succeed at school in many ways. It is associated with insecurity and low self-esteem; violence; aggression and stress; inadequate nutrition; crowding and inadequate facilities. International research has also shown that children from impoverished homes struggle to make sense of the academic, formal or principled knowledge they encounter at school (as opposed to their

everyday or experienced knowledge). Unlike their middle-class counterparts, they do not arrive at school with conceptual foundations already in place their school learning is not reinforced at home. Poverty also affects what schools can offer children. South African parents can be exempted from paying school fees, but this leads to a lower funding base for schools. The school thus has to raise additional funding, or make do with less. ESD learning process initiatives such as Eco-Schools are showing potential to address key elements of educational quality in this context, most notably providing motivation for teachers and learners to get involved in learning that matters to them, and to improve the conditions of schooling. The Eco-Schools programme also shows evidence that Eco-School activities provide mechanisms for improving epistemological access, or for helping learners to learn the unfamiliar through actions and projects in the school grounds that contextualise complex concepts.

This case study is part of an article published in the *Southern African Journal of Environmental Education,* written in the context of the Eco-Schools programme in South Africa. Eco-Schools South Africa is increasingly being used by external partners as a framework for supporting ESD/EE in their schools. The article concluded the Eco-Schools programme has significant potential to improve conditions for teaching and learning, despite some signs of the quality issues that currently plague the school system. It is being used here to contribute to the quality education debate.

CASE STUDY 11
ESD POLICY FOR THE UNIVERSITY OF NAMIBIA
(by Cornelia N.S. Shaimemanya)

The University of Namibia (UNAM) ESD policy is the product of a participatory process and multi-stakeholder dialogue and consultations between 2009 and 2010. The university will address environmental, economic and social-cultural challenges by integrating ESD strategies within its mandate. Proper implementation of the ESD strategy will make UNAM a sustainable university.

The UNAM ESD policy implementation strategies are guided by Vision 2030, DESD, and the Strategic Management Plan for the university. The implementation plan is based on all the mandates of the university. The plan will integrate all the mandates in line with the cross-cutting pillars of SD that are environmental and economic, and whose impacts are felt across all stakeholders including the university, the Namibian community, and the Southern Africa Development Community region.

The ESD policy aims to improve learning and enhance participation of university members. In line with this effort, the university mandates of Training, Research, Innovation and Community service will be affected by the policy. The University of Namibia looks forward to the document being implemented by all concerned stakeholders in 2012 and the review period should be after five years, in 2017. The university will address the environmental, economic and social-cultural challenges by integrating ESD strategies into its mandate.

This case study of a university re-orienting its practices and ways of being and doing using ESD learning processes and concepts, is not an isolated practice on the African continent. A recent study by the Global Universities Network for Innovation, the African Association of Universities and the International Association of Universities (2011) shows that a number of universities in Africa are integrating ESD learning processes and principles into their policies, their curricula and their community engagement

and management activities – with positive outcomes in terms of new knowledge acquisition, and new, more sustainable practices. A 'futures' perspective is also being created for African universities which are currently being encouraged to 'revitalise' their practices and to contribute more substantively to society and to Africa's development path. The MESA universities network involves over 90 universities in 32 countries, showing that these practices are spreading across the continent (UNEP, 2008).

CASE STUDY 12
TRAINING OF TEACHERS IN ESD
(IN-SERVICE AND PRE-SERVICE IN UGANDA)

Uganda, like most countries in Africa, is experiencing indiscriminate environmental degradation. Poor sanitation is evident by the amount of waste that is dumped in channels, wetlands, rivers and lakes. Unsustainable farming methods have led to soil degradation and loss of biodiversity. There is little action and participation from the community leading to bare schools and massive deforestation. There is also a lack of awareness and general sensitivity to environmental management.

One of the responses to this condition is the training of teachers (in-service and pre-service) in ESD learning processes, using a variety of methods which include field trips, group work, brainstorming, discussions, action learning, lectures and demonstrations. Another method used in ESD activities includes environmental awards, which are offered at national, district, school and community levels.

Outcomes - Results from these ESD practices that are worth noting are:

Training of Teachers (in-service and pre-service): A team of about 100 environmental education practitioners provides leadership at the grassroots level, trains teachers, facilitates activities, generates innovative approaches, promotes networking and participates in materials development, adding to the database for environmental education**.** Training takes the form of workshops. The topics of the workshops include global, national, regional and local environmental issues, partnerships, networking, projects, curriculum integration, drawing participatory action/work plans.

Environmental Awards Schemes at National, District, School and Community Levels: The target groups for the awards scheme are public and private sectors, community leaders, non-governmental organisations, community based organisations, youth groups, women, school communities and children. The scheme seems to be successful because it involves all groups and is motivating. Through the different environmental projects, people and children learnt about conservation methods and the environment has improved. The district offices present their state of the environment report before registering for an award with National Environmental Management Authority (NEMA).

This case study too shows that there is re-orientation taking place in teacher education practices based with and through ESD learning processes. UNESCO have recently established AFRITEIS, a continent-wide teacher education network coordinated from the UNESCO Bamako office. This network has established sub-networks, and new teacher education practices are emerging via these networks that strengthen ESD learning processes for enhanced educational quality and relevance in and through teacher education. There is some evidence of significant changes that have taken place as a result of such regional networking, for example, the University of Zambia has introduced a B.Ed degree in Environmental Education which

attracts many students, and they are now offering a regional training programme for teacher educators focusing on an ecosystem services approach to understanding sustainability issues. The University of Lesotho, also a member of the AFRITEIS network, has started a Science and Environmental Education Masters Degree in the Faculty of Education. Developing ESD learning processes through research and new teaching practices, supported by a legitimate research agenda drawing on some of the insights provided here on ESD learning processes and educational quality, can hopefully set new directions for educational thought and practice in Africa.

The debate on education quality perspectives and frameworks should be opened up to more key stakeholders including researchers, teachers, learners and communities. This will help in exposing any hidden ideologies that underpin current education quality thinking in Sub-Saharan Africa and help in the design of education quality frameworks that address the specific needs of the region.

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TOWARDS A PROGRAMME OF ACTION AND RESEARCH

This publication has sought a synthesis of what is known about ESD learning processes in Sub-Saharan Africa through a contextual review, a literature review and analysis of case studies. The study was limited by time constraints in collecting a larger number of cases, as well as by a dearth of published literature on ESD learning processes in Africa. However, the study was able to point to some key features or propositions that can provide a 'way forward' for further research and praxis in the area of ESD learning processes, and can help to develop theory and practice for a fuller understanding of ESD learning processes and their contributions to educational quality in South Africa.

The publication has shown that ESD learning processes introduce a number of important propositions into educational thinking, and particularly educational thinking about quality; namely that:

ESD learning processes change the focus on learning to 'learning as connection' and foreground meaning making in the learning process as the basis for efficacy and inclusivity. This requires a wider engagement with different ways of knowing, or inter-epistemological dialogues, and changes in pedagogy.

ESD learning processes can enhance learners' capabilities (abilities to express and make choices about valued beings and doings); **critical thinking and action competence** (abilities to act); **and agency** (evidence of action). This requires different forms of pedagogy, but it is notable that there is a high level of interest in these forms of pedagogy and these outcomes of education amongst ESD practitioners on the continent. This is because these approaches all foster change, or change-oriented learning. Pedagogical models

exist to support such approaches to learning, and these have been tried and tested in a number of settings.

ESD learning processes can enhance relevance of education. This can take place through various strategies, such as including ESD topics in localised curricula, and through place-based education activities or use of local audits (for example). Relevance of education is not just local, but involves learners in hybrid relationships between the local and the global, and in identity formations and negotiating of directions and purposes for engaging in educational activities. ESD learning processes support such initiatives.

It is possible to improve educational quality through ESD learning processes. ESD learning processes emphasise a broader notion of educational quality than that which has traditionally shaped educational quality thinking and practice in Africa. They bring 'learning as connection' or socio-cultural/social-ecological and social justice perspectives of quality into focus, to *complement and extend* notions of quality as efficiency and quality as inclusion. Together, a new framing of educational quality is possible that takes account of local epistemology, cultures, and those meaningful practices which help to 'teach' abstract concepts and knowledge. Transformations are taking place in African education systems that take account of this notion of quality, although it has not been explicitly stated as such. It seems to be more driven by a 'bottom up' interest in relevance, and the *meaning* of education in Africa.

The four propositions put forward in this publication constitute a possible 'way forward' to guide further research and practice in shaping the contribution and role of ESD learning processes in Sub-Saharan Africa.

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