Policy Implications for Teacher Professional Development on Biodiversity: Lessons from the Fundisa for Change Programme
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Overview and Background
Wider context

• The RSA Constitution: Section 24 Bill of Rights: Right to a healthy environment and sustainable management of country’s resources
• The 1995 White Paper on Education and Training: EE as principle
• C2005, RNCS & CAPS: a key principle statement focusing on the relation between a healthy environment, social justice, inclusivity and human rights
• SA ahead of its time in terms of ESD curriculum development – included in an example in a UNESCO policy dialogue document in 2008 already
Wider context cont...

- The problem of ‘new content’: DBE diagnostics
- Environmental / ESD content – new in the curriculum – and covers up to 50% in some Subject areas: KEY CONCEPTS – climate change; biodiversity; taxonomy; GIS, human impact, sustainable development; environmental health; green economy
- GEM 2016 report: Teacher education systems ‘catching up’ with curriculum changes (not only SA) ... ESD included in curricula in countries around the world but poorly dealt with in TE
- A new “type” of education is needed ... transformative, oriented to the common good

2016 Global Education Monitoring Report
The SDGs and Education

Indicator 4.7: ESD & GCE as integral to quality education
Transformative [Environmental/ESD] Learning through Teacher Education

A national PLC started in 2011/12 in response to a range of national studies on skills and capacity for sustainable development (DWA Water HCD, SANBI Biodiversity HCD, DST Global Change HCD, DEA ESSP) which showed problem with ‘foundational knowledge’ for entry into these areas of national importance.
Partnership Orientation

A partnership programme
Transformative Environmental Learning through Teacher Education

Co-ordination

CAPACITY BUILDING

POLICY AND ADVOCACY

BUILD A NATIONAL SYSTEM OF ENGAGEMENT

CURRICULUM AND TEXTBOOK CONTRIBUTIONS
The DBE approved the First Set of Training Programmes in 2012. The DBE recognises Fundisa as an ‘important national PLC’. The programmes have SACE endorsement and approval. The programme has been presented at the national Education Deans Forum by the DBE.

**Strong DEA Support for establishing the programme:**

“There is need for a strong national partnership to make environmental content knowledge available to the education and training system to fast-track the inclusion of new environmental content knowledge into the national system of education and training”, said Mabudafhasi (the then Deputy Minister of Water and Environmental Affairs).
CPD Courses and Materials for wider use in TE and CPD
Programme course structure

- Reading and writing to learn
- Active learning
- Mathematical skills
- Critical and creative thinking skills
- Subject-specific pedagogical practices

Content knowledge

- Foundational knowledge
- Knowledge is contested and uncertain
- Knowledge progression and quality

Teaching practice

Assessment practice

- Subject specific assessment practice
- Higher order questions for assessment
These are common property resources for use in SA teacher education (public sector developed, and public sector resource); Shared intellectual resources from across SA’s Teacher Education Institutions

Co-authored: 13 materials developed (10 subject specific & 3 generic)
Materials cont ...

• Urgent need for new materials on:
  – Environmental Impact for Grade 10-12
  – Green Economy and entrepreneurship for EMS

• Currently developing an e-learning version of the Fundisa ToT programme – to facilitate access to the materials and the programme
Accreditation & Endorsement

- University-based certification of Fundisa CPD short courses
- ETDP accreditation aligned for NGOs (WESSA & Delta), but easier to certify through universities short course / CPD systems
- SACE Endorsement for longer and shorter courses [20 points / 15 points]
- Endorsed providers involved in Fundisa network (all applied)
Total number of teachers trained per module out of 448

- **Biodiversity: FET Life Sciences (MP, EC, WC)**: 3
- **Climate Change: FET Geography (NC, WC, GP, FS)**: 4
- **Water: GET Social Sciences (GP, KZN)**: 2
- **Life and Living: Intermediate Phase: Natural Sciences & Technology (KZN)**: 1
- **Climate Change: Senior Phase Natural Sciences (WC, KZN, EC, NW)**: 4
- **Water: Intermediate Phase Social Sciences (NC)**: 1
Research

Research objectives:
1. Understand how situated learning pedagogy may contribute to acquisition of environmental disciplinary knowledge
2. Understand the (ontological and epistemological) nature of new environmental knowledge and its recontextualisation (school context)

Five key knowledge areas:
• Biodiversity
• Climate change
• Environmental health
• Sustainable development
• Water security
Classroom research

Christina Chitsiga researched mediation through the lenses of deliberation, situated learning, practical reason and proximity experience.

Antonia Mkhabela investigated Grade 11 teachers’ methods and assessment practices in mediating Life Sciences environmental content knowledge and competencies.

Constance Elekwa is exploring the integration of indigenous knowledge in the Life Sciences classroom (three senior secondary schools in the Gert Sibande district in Mpumalanga).

Nomvuyo Mgqoqi is exploring formative assessment in environmental learning processes in Primary School Natural Sciences classrooms.
Classroom research ctd

Understand the (ontological and epistemological) nature of new environmental knowledge and its recontextualisation (school context).

Zingisa Gqoloqa explored how Grade 11 Life Sciences educators make meaning of biodiversity concepts for English second language learners.

Dorelle Isaacs conducted an Exploration of What Grade 7 Natural Science Teachers Know, Believe and Say about Biodiversity and the Teaching of Biodiversity.

Phumeza Peteni-Mzayidume: A study of sustainability concepts, pedagogy and assessment practices in the 'Enjoy Economics' Grade 12 textbook.

Jacques Pienaar (Rhodes University). Title: An investigation of student engagement and value creation, while using a web based platform to investigate local water concerns.
Teacher Professional Development research

Lebona Nkahlle is researching continuing teacher professional development in the Fundisa for Change programme.

Anisa Khan is researching the Development of Teacher Knowledge and Competencies for Sustainability in Professional Learning Communities (PLCs): A case within the Eco-Schools programme.

Gavin Heath is exploring the development and transferability of sustainability competencies in (Geography Teacher Education).

Sirkka Tshiningayamwe is researching Professional Learning Communities in the Fundisa for Change programme.

Zintle Songqwaru is evaluating continuing professional teacher development in the Fundisa programme.

Susan Brundrit: A case study of emergent environmental pedagogical content knowledge in a Fundisa for Change teacher professional development programme.
Key Findings From the Fundisa for Change Research Programme

- Biodiversity concepts not well defined in the curriculum – creates problems for progression and foundational learning for biodiversity sector learning pathways.
- Learners have not been performing well in environment and biodiversity content in Life Sciences.
- Textbooks often do not contain the current, up to date and accurate information relating to the biodiversity content.
- Fundisa programme show that teachers in turn need support to understand biodiversity knowledge in all its aspects including taxonomy, biomes, classifications biomes, climate change.
- Little systemic support for learning new complex concepts and knowledge areas – when support is provided – tangible impacts at classroom level, including confidence, competence and learner achievement can be observed.
- Main Carrier subject for biodiversity related concepts can be found in Natural Science and Life Sciences. But it can also be found in other subjects e.g. agricultural science, agricultural management practices, agricultural technology, Tourism, Geography and Social Science.
Abstract: What constitutes adequate teacher professional development support that enables teachers to engage meaningfully with ESD learning processes? In an attempt to answer this question, this chapter focuses on how continuing teacher professional development programmes can support teachers of Life Sciences to teach biodiversity as a grounding concept to strengthen educational quality and relevance of Life Sciences education. It reflects on how continuing teacher professional development programmes may be designed and implemented to support South African teachers to work creatively with a content and assessment-referenced national school curriculum. The chapter focuses on what content knowledge, teaching and assessment approaches to include as well as teachers’ reflections on the impacts of such a programme.
Recommendations

There is a need for Scaling of the Fundisa for Change Programme in terms of biodiversity support in Teacher Education Institutions and Teacher Education

- Need greater research on how progression of biodiversity content knowledge is dealt with in the Curriculum (CAPS)
- More in-depth review / research needed to explore the representation of biodiversity content in the textbooks
- Need for collaboration in the biodiversity sector to work with the DBE to strengthen the biodiversity content in the CAPS.
- As the Biodiversity Sector there is a need to provide training and support across the education system that focuses on knowledge, pedagogy and assessment on the biodiversity content in the CAPS and to ensure there is adequate accessible research and resources available to support a knowledgeable teacher.
SO 5: Conservation and management of biodiversity is improved through the development of an equitable and suitably skilled workforce:

• How explicit is the education and capacity development elements in the documents linked to formal education and capacity development?
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