CHAPTER 19

A Realist Approach to Evaluating the Fundisa for Change Training Programme

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Introduction

A significant change in the South African education system in the post-apartheid era was the recognition of the importance of integrating environmental education (also defined as education for sustainable development and/or environment and sustainability education in South Africa) into the national school curriculum. Educators (both office and classroom based) are viewed as change agents who can deliver the educational responses needed to achieve Sustainable Development Goals (Unesco 2017), and as such it is imperative that teacher education programmes that aim to prepare educators to implement Education for Sustainable Development be evaluated.

This chapter focuses on the use of a theory-based approach to programme evaluation, in order to surface assumptions that underpin the Fundisa for Change Teacher Education training programme. An interrogation of unexamined assumptions embedded in teacher education programmes through a theory-based approach to evaluation provides insights, first, into how programme objectives are operationalised to achieve desired programme outcomes. Second, it provides an explanation of how, why and for whom programme outcomes were achieved, or not. Results from a theory-based evaluation process can enable a critique of professional development programmes with the aim of improving their conceptualisation, implementation and evaluation.

If a programme is successful, an evaluation of the programme should identify which elements are critical for widespread replication in other contexts. Even if a programme fails to achieve its intended outcomes, an evaluation should be able to determine whether non-achievement is due to inadequate implementation; whether the context is unsuited to operate the mechanisms by which outcomes are expected to occur; or whether failure can be attributed to the programme theory itself (Coryn, Noakes, Westine & Schröter 2011).

Mason and Barnes (2007) argued that programme theories are refined as they are being explored. What was intended to happen, what does actually happen in implementation and delivery, and the identification of the factors that lead to outcomes, are only visible through research that seeks to understand how the programme works in context.

Context and background

Chapter 1 of this book has given a broad overview of the Fundisa for Change Teacher Education Programme. This chapter is therefore focusing only on the capacity development objective of the programme, with a particular focus on building the capacity of educators who are expected either to implement or support the implementation of environment and sustainability education in the schooling system. The programme developed a monitoring and evaluation system in two impact areas, one of which focused on educators' content knowledge and practice. This component of the monitoring and evaluation assesses the extent to which the Fundisa for Change programme influences and/or improves educators' knowledge and practice. It addresses the following questions:

- How (if at all) is the Fundisa for Change training programme improving educators' knowledge and practice?
- What contextual factors influence educators' engagement and success in the Fundisa for Change training programme?

The study responded to this impact area by asking the following research questions:

1. What theory of change shaped the Fundisa for Change professional development training programme?
2. What is the Fundisa for Change training programme's implementation theory?
3. What is the Fundisa for Change training programme's programme theory?
 - For whom did the programme theory work and why?
 - In what contexts did the programme theory work and why?
 - What mechanisms enabled the programme theory to work?
 - What outcomes were achieved?

A theory-based approach to evaluation

A theory-based approach to evaluation makes it possible to determine a programme's intended outcomes, the activities that will be implemented to achieve those outcomes, and the contextual factors that may influence the implementation of the activities and thus the programme outcomes.

The aim of using this approach to evaluate the Fundisa for Change training programme was to identify the context and mechanisms that enable the achievement of the stated training programme outcomes. A realist Context-Mechanisms-Outcomes (CMO) configuration framework was used in the study to unpack the programme theory of the professional development course in the Fundisa for Change programme. The table below shows an elaborated CMO configuration adapted from Pawson and Tilley (1997) and De Souza (2013).

Table 1. Elaborated CMO configuration adapted from De Souza (2013)

Context	Mechanisms		Outcomes
	Resources (material, cognitive, social & emotional)	Reasoning	
Structure: internally related objectives and practices	Roles, positions, practices, processes, resources	Preferences, beliefs, norms, values	Transformation or invariance or reproduction
Culture: ideas that influence the actions of individuals, thus determining certain outcomes	Ideas, propositions, theories, arguments about structure, culture, agency and relations	Preferences, beliefs, norms, values	Transformation or invariance or reproduction
Agency: intentional engagement in action or non-action influenced by cultural or structural conditions	Motivation	Preferences, beliefs, norms and values for action or non- action	Transformation or invariance or reproduction
Relations: interaction between related entities	Duties, responsibilities, powers and rights	Preferences, beliefs, norms, values	Transformation or invariance or reproduction

Cheyne, Abhyankar and McCourt (2013) stated that the context in which a programme is implemented shapes the mechanisms and outcomes. Hence a programme evolves when introduced into different contexts as context tends to influence what people do and how they will act. When a programme is implemented in another context, there are inevitably differences in infrastructure, institutions, stakeholders and participants. Consequently, some critical causal configurations on which programme success depends might be broken by the shift. A programme can still obtain the same objectives in different sites but by different means (Pawson 2001). Pawson and Tilley (1997) argued

that all programmes are conceptualised and implemented into pre-existing social contexts. Context has an influence on the success or failure of a programme.

The Fundisa for Change programme was adapted in different contexts (provincially) and for different participants (teachers and senior education specialists) by the facilitators who implemented the programme. The complexity had to be monitored during site evaluation of the programme. Contextualising a programme brings complexity, as adapting a programme into a local setting has implications for both programme theory and design (Sridharan & Nakaima 2012). Riché (n.d.) believed that programmes should be contextualised as programme outcomes are influenced by social, institutional, cultural, economic, geographical and political factors embedded in local environments. Understanding a programme's theory within a specific context and how it interacts with factors external to the programme is important in capturing the 'how' and 'why' of programme outcomes. Programme outcomes are thus critically dependent on the choices made by participants and programme resources offered by programme implementers (Pawson & Tilley 1997).

Mechanisms in realist evaluation, according to Pawson and Tilley (1997), are a combination of resources offered by a programme and participants' reasoning in response to the resources offered. Programme resources, that is mechanisms, may be material, cognitive, social and/or emotional. Programmes work when these resources resonate with programme participants (Pawson 2003). According to Westhorp (2012), participant reasoning includes preferences, norms and beliefs and these underpin decisions that lead to particular actions, which in turn enable or constrain outcomes. Partly, the success or failure of programmes is due to the reasoning and personal choices of different participants (Pawson et al. 2005).

Mechanisms are identified in order to determine potential causal powers, for example, what the intervention does that can produce the expected outcome in the conditions in which it is introduced.

The stated outcomes of the Fundisa for Change professional development training programme were:

- *Subject Knowledge and Learning (Theory)*: Show improved understanding of environment and sustainability subject knowledge in the context of a specific subject and phase [content knowledge].
- *Pedagogical Knowledge and Learning (Theory & Practice)*: Show ability to use appropriate teaching methods and assessment approaches for specified subject knowledge, skills and values.
- *Situated Knowledge and Learning (Context)*: Relate subject-specific environment and sustainability content knowledge to broader issues and contexts.
- *Practical Knowledge and Experience (Work Experience)*: Design, develop, implement and reflectively review a lesson plan/sequence of lesson plans relevant to an environmental and sustainability content focus in a particular subject and phase/grade.

Data generation

In order to determine the training programme's programme theory as well as for whom the programme worked and under what conditions, a CMO configuration was generated from document analysis (Fundisa for Change documents), interview data (key Fundisa for Change partners and facilitators), questionnaires (participant post-training evaluations) and observation (on-site training implementation). Conclusions drawn from each site produced cumulative knowledge that was used to generate a general programme theory for the Fundisa for Change professional development course.

The thematic training focus in three of the five sites was on teaching the theme of water in Social Sciences. Participants in the three sites were senior education specialists in the intermediate and senior phase who support Social Sciences teachers. The other two sites focused on climate change in Geography and Natural Sciences. Participants were Geography teachers in one site and Natural Sciences teachers in the other. The researcher observed actions, reactions and interactions (Gummesson 2000) between participants; between participants and facilitators; and between participants, facilitator and training settings.

Data analysis

Surfacing the programme theory of the Fundisa for Change training programme required a detailed, rich and textured description of what was observed at each site. A CMO configuration was used to show what outcomes were achieved and what mechanisms enabled the outcomes to be achieved under what circumstances. Figure 1 shows a visual representation of the CMO configuration.

Figure 1. CMO configuration

A cross-analysis of observation data from the five sites was done to develop a CMO configuration of the Fundisa for Change training programme. According to Yin (2009:

156), ‘cross-case analysis is the process of comparing and contrasting across case study analysis’. This was done to determine what was common to all the sites as an indicator of the necessary conditions for achievement of training objectives. Table 2 provides a Fundisa for Change professional development programme CMO configuration.

Table 2. CMO configuration for Fundisa for Change professional development training programme

Context (internal to Fundisa for Change programme)	Mechanisms		Outcomes (professional development course)
	Resources (material, cognitive, social & emotional)	Reasoning	
Structure: <ul style="list-style-type: none"> Multiple partners facilitating training from diverse sectors (environment, government and universities) Participants and facilitators familiar with the schooling system and curriculum Participants were target group in terms of their work and content covered Department of Basic Education involved in choosing theme of training and participants to be trained Culture: <ul style="list-style-type: none"> Facilitators value collaboration in implementing training Participants value collaboration, learning with and from each other (group work activities and peer assessment) Agency: <ul style="list-style-type: none"> Facilitators have flexibility to use own expertise to adapt training programme Participants attend voluntarily and actively participate Relations: <ul style="list-style-type: none"> Facilitators commit to implement training with colleagues Participants belong to same professional learning community 	<ul style="list-style-type: none"> Redefining roles Introduction to new knowledge and resources On-course tasks and assessments Content knowledge presentations by facilitators 	Discussions, questions, reflections, as well as how activities were mediated, enabled participants to learn new content knowledge and see value and relevance in what they currently do and are expected to do.	Participants have an improved understanding of environment and sustainability subject knowledge in a specific subject and phase.
	<ul style="list-style-type: none"> Introduced to ESD teaching strategies through modelling Teaching method resource book Presentation on assessment On-course task to set assessment task Field work and hands-on activities 	Discussions on teaching practice and assessment to influence participants to reflect on current practice. Modelled teaching strategies encouraged reflection on current practice and motivated adoption of new teaching strategies. Critique of assessment practice enabled reflection and opportunities for change of assessment of practice.	Participants are able to use appropriate teaching methods and assessment approaches for specific subject knowledge, skills and values.
	<ul style="list-style-type: none"> Contextualising training content to local environment 	Group discussions on topic and its relevance for everyday life and the curriculum enabled participants to understand other perspectives on the topic.	Participants are able to relate subject-specific environment and sustainability content knowledge to broader issues and contexts.

Context (internal to Fundisa for Change programme)	Mechanisms		Outcomes (professional development course)
	Resources (material, cognitive, social & emotional)	Reasoning	
	<ul style="list-style-type: none"> Developing capacity of participants to be able to perform redefined duties and responsibilities, as they plan to implement at work Peer assessment 	Perceived relevance of on-course activities and portfolio of evidence tasks to their everyday work.	Participants are able to design, develop, implement and reflectively review a learning programme relevant to a particular subject, phase and/or grade.
	<ul style="list-style-type: none"> Field work and hands-on activities 	Discussions and reflections on personal values and choices.	Change-orientated learning.

Findings of the evaluation showed that the achievement of the stated Fundisa for Change training course objectives was influenced by structure, culture, agency and relations, both internal and external, to the training programme. The structure of the Fundisa for Change training programme adopts a multi-stakeholder model where training course facilitators from different sectors (government, NGOs and institutions of higher education) work together to implement the professional development training course. This meant that different facilitators, due to their professional backgrounds, experiences and expertise, brought various mechanisms (materials, cognitive, social and emotional) that influenced participants' reasoning in relation to their own practice, thus giving participants opportunities to redefine their roles. Facilitators embraced working collaboratively, as evidenced by voluntarily becoming partners in the Fundisa for Change Teacher Education programme and working with other partners to plan training sessions. Some of the partners have a history of having worked together in the past.

Additionally, in three of the study sites, participants were already a professional cluster as they were used to attending Department of Basic Education workshops together. They were therefore used to working together, sharing experiences and giving each other peer feedback.

Although the Fundisa for Change training programme has a course structure, the variable access to training facilities and the uneven conditions under which participants are trained made it necessary to build in contextual factors when designing the course. Facilitators used their agency to adapt the training so that it was responsive to the context in which they were implementing the training. Different facilitators also used different facilitation skills, which ranged from the teaching of new content knowledge, to discussions and modelling of various teaching strategies. On-course tasks required participants to work both individually and in groups to reflect on their practice and present their work for input from peers and facilitators.

The choice of training resource materials used during the training covered the subject content knowledge that participants were teaching or supported others to

teach. Additionally, the resources were contextualised to the participants' local environment: for example, a focus on the health of a river would use a river found in the province where participants were based. Field-based activities took participants to local places where they could explore concepts in practice, for example, visiting a local water purification plant to understand the purification process. Field work provided participants with 'learning in context', enabling them to see the relationship between theory (content specified in curriculum documents and textbooks) and practice (water purification plant).

An additional outcome that was achieved by participants, although not made explicit in the training objectives, was change-orientated learning. How on-course tasks were mediated challenged participants to think deeply about the values they hold, and how these relate to their actions and choices (Rosenberg et al. 2008: 21). Participants shared how they would do things differently in their personal lives, demonstrating that what is valued influences actions. Participants shared what and how they learned; this created opportunities for transformative learning, which is significant for a programme like Fundisa for Change that is aimed at enhancing transformative environmental learning through teacher education (Fundisa for Change Programme 2013).

The following Fundisa for Change training programme outcomes were achieved:

- Participants' understanding of environment and sustainability subject knowledge in a specific subject and phase improved.
- Participants were able to use appropriate teaching methods and assessment approaches for specific environment and sustainability subject knowledge, skills and values.
- Participants were able to relate subject-specific environment and sustainability content knowledge to broader issues and contexts.
- Participants were able to design, and develop, a learning programme relevant to a particular subject, phase and/or grade, and to reflectively review both their own and their colleagues' learning programmes.
- Participants demonstrated change-orientated learning.

Due to the diverse facilitation skills and mechanisms introduced by the facilitators during training, the achievement of the above-stated training programme outcomes was at varying degrees for different participants. This speaks to the realist approach to evaluation that asks the question, '*For whom does the programme work, under what conditions?*'

An improved understanding of environment and sustainability subject knowledge in a specific subject and phase was evident in sites where additional knowledge resource materials, besides school textbooks, were brought on site. It was also evident in sites where participants recognised that concepts discussed, even though they went beyond content specified in the curriculum documents, were part of the school curriculum.

In sites where participants engaged in field work and hands-on activities, there was evidence of an ability to contextualise subject content knowledge to the local

environment. Additionally, participants were able to reflect on current lifestyle choices in order to make sustainable lifestyle choices.

An explicit discussion on teaching strategies for environmental teaching and learning, as well as the modelling and critiquing of teaching strategies, supported the acquisition of new teaching methods. Assessment practices were enhanced in sites where participants were given opportunities to set and analyse assessment tasks, and also analyse those set by colleagues. Feedback sessions on the analysis of assessment tasks enabled participants to get feedback from facilitators and colleagues and to learn from the discussions.

Participants designed and developed refined learning programmes in instances where they had brainstormed ideas with colleagues before they adapted their learning programmes to accommodate their own contexts. This was even more evident in sites where the learning programmes were reviewed by colleagues and participants received feedback from colleagues and facilitators.

Implications and recommendations for teacher professional development in environment and sustainability programmes

Programme success can be achieved if what needs to be changed is identified and steps to address it are clearly defined. In the Fundisa for Change case, research on environmental education in the schooling system informed programme stakeholders on the gaps in the system, for example, lack of adequate environment and sustainability content knowledge and insufficient skills to teach and assess that content, as well as insufficient resources for teaching the content. The critical components of what is at the core of a professional development programme must be made explicit to all programme stakeholders. This will enable a flexible adaptation and contextualisation of the programme in diverse contexts.

Moreover, programme implementers need to share how they have implemented and adapted the programme to address local needs. How programme mechanisms are enacted in the various contexts should be shared and reflected upon. Programme adaptation in different contexts needs to be explained and justified. This will lead to an accumulation of knowledge about a programme's theory of change and how it needs to be refined for future training in diverse contexts.

Although a programme has a structure and predetermined objectives, it must be flexible enough to take into account the context and needs of the participants, as each context has its own enabling and constraining factors that have an influence on programme outcomes for programme participants.

Participants should be challenged to think critically about their roles and whether or not their capacity matches the roles and responsibility of their work contexts. Additionally, facilitators need to model the teaching strategies and assessment skills that they want participants to acquire. This allows participants to see how the strategies work in practice and it gives them an opportunity to reflect on how the methods modelled and the assessment tasks can be used in their own contexts.

Subject- and phase-specific professional development programmes increase chances of the programme being applied by participants in their work contexts. Professional development programmes have a better chance of being successful when they resonate with the urgent changes that teachers need to implement in their teaching practice. Moreover, if the development of professionals is to be sustained, teacher professional development programmes need to be supported by education policies. Programme stakeholders should position the programme in the policy context in order to facilitate participant buy-in. How participants and facilitators understand policy documents is also important as different policy interpretations may lead to different policy enactments.

Governments, funders, accrediting bodies and professional bodies should be required to support teacher professional development programmes and provide the necessary funding and resources needed to implement those programmes. More importantly, professional development programmes must be institutionalised within professional development directorates so that funding can be made available for the delivery of the programmes on a more sustainable basis.

Conclusion

Even with an explicit theory of change, Danermark, Ekström, Jakobsen and Karlsson argued that

we will never be able to predict accurately concrete social events, for example exactly how people are going to act in a particular situation neither can we anticipate situations. This does not mean, however, that social scientific knowledge is useless for social planning. If we have knowledge of the mechanisms of social structures, we can identify the driving forces behind the events we are observing. Doing so we can also in a more qualified manner estimate the possibilities, deficiencies and limitations of the actions we plan. Without this kind of knowledge, the analysis of a phenomenon will always be superficial or even incorrect. (2002: 187–188)

Programme outcomes for participants will vary based on their beliefs, personal concerns, and degree of commitment in the face of structural hindrances. Additionally, they will vary according to participants' readiness to avail themselves of enablements provided by programmes. Programmes should therefore respond adequately by addressing participants' subjectivities. Participants' personal liabilities and powers need to be acknowledged, in particular, their power of reflexivity to think about themselves in relation to their contexts, so that they are able to make programmes work for them (Archer 2010).

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