

**Investigating the Mainstreaming of Inclusive Education in Teacher Education Practice
for Pedagogical Proficiency through Education for Sustainable Development
Change Projects in Southern Africa**

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By

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ABSTRACT

Globally, there are policy and practice efforts to mainstream inclusive education in different sub-fields of education. Part of the efforts have focused on investigating and finding practical mechanisms for the mainstreaming process in teacher education. Anecdotally, Education for Sustainable Development (ESD), with its focus on transformative education, collaborative learning, the community of practice and the whole institution approach, has the potential to mainstream inclusive education in teacher education practices if grounded in sociocultural realities rather than mere ideological framing. This situation is related to the need for more transformative capabilities for teacher educators to prepare teachers for inclusive pedagogical proficiency. However, in a southern African context, the outlook of the potential of pedagogical proficiency from the nexus of inclusive education, ESD and teacher education is disjointed. As such, this study focused on investigating the mainstreaming of inclusive education in teacher education practice for pedagogical proficiency through ESD Change Projects in Southern Africa, examining cases from Malawi, Tanzania and Eswatini.

The study intended to gain an understanding of inclusive education and ESD in these countries, identify areas for strengthening inclusive education in teacher education practice, collaborate with teacher educators to develop strategies for mainstreaming inclusive education, and generate indicators for monitoring and evaluating inclusive education in teacher education contexts. The study used Urie Bronfenbrenner's bioecological theory of human development and Lev Vygotsky's sociocultural theory of learning as theoretical and analytical frameworks. The study also employed Roy Bhaskar's critical realism philosophy as an underlabourer or a meta-theoretical framework. The study further adapted the Vygotsky-informed Engeström's expansive learning as a methodological torch. Together, these frameworks were used to analyse selected Change Projects within Sustainability Starts with Teachers (SST) programme, which focused on ESD capacity building in teacher educators from 11 southern African countries. In this regard, the research utilised a qualitative nested case study design. A formative interventionist research approach supported the cases in Malawi, Tanzania and Eswatini, with the study selecting SST Change Projects dealing with inclusive education through an initial scoping questionnaire. Data were generated through 12 in-depth interviews, nine workshops (involving 24 participants), document reviews, observations and reflective journals. Thematic

analysis, employing a critical realist approach with abductive and retroductive reasoning, guided the reflexive presentation and discussion of research findings.

The research findings revealed a common understanding of inclusive education as providing equal educational opportunities, ESD as supporting sustainable development, and teacher education as skill development. The research findings also highlighted the influence of teacher educators' biopsychosocial characteristics on their perceptions of inclusive education, ESD and teacher education. Areas requiring improvement in teacher education systems included resources, attitude change, financing, cooperation, collaboration and leadership. Strategies for mainstreaming inclusive education in teacher education practice for pedagogical proficiency included curriculum implementation, policy shift, contextualisation and interactive systems. Monitoring and evaluation in all three cases focused on teaching practice, assessment, feedback tools, forums and curriculum implementation, but the absence of specific indicators for monitoring and evaluation was evident. These findings suggest multi-layered and complex implications for policy formulation, implementation practices and future research.

Therefore, this thesis argues that, in a southern Africa context, the potential of pedagogical proficiency from the nexus of inclusive education, ESD and teacher education involves considering biopsychosocial characteristics to facilitate the capabilities of teacher educators. This situation necessitates utilising inclusivity mechanisms in pre-service teacher training grounded in biosocial and psychocultural realities of the region's educational challenges. Consequently, this thesis proffers the Sustainable Inclusive Pedagogical Proficiency Process (SIP3) model as a framework to actualise the nexus of inclusive education, ESD and teacher education, and bring into focus its pedagogical proficiency potential which eventually helps with the mainstreaming process in teacher education practice via ESD. The study reported in this thesis contributes to international theory and practice development for inclusivity and ESD in teacher education practice, provides indicators for monitoring inclusive quality education in teacher education practice, and introduces a contextual dynamics model for comparative education research. The thesis is structured in eight chapters, introducing the study context, addressing literature gaps, presenting the theoretical framework, detailing research design, exploring specific cases in Malawi, Tanzania and Eswatini, discussing the research findings and its implications, and concluding with recommendations for change and future research.

DEDICATION

In the loving memory of my late father, Chairman Al-bin Edwin Souza (1944-2008).

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LIST OF ACRONYMS

ADL	: Actual Developmental Level
CHAT	: Cultural Historical Activity Theory
DUCE	: Dar es Salaam University College of Education
ECOT	: Eswatini College of Technology
ELRC	: Environmental Learning Research Centre
ESD	: Education for Sustainable Development
GEM	: Global Education Monitoring
ICT	: Information and Communication Technology
PEER	: Profiles Enhancing Education Reviews
PETTC	: Phalombe Teacher Training College
PPCT	: Process-Person-Context-Time
ROSA	: Regional Office for Southern Africa
SADC	: Southern Africa Development Community
SDGs	: Sustainable Development Goals
SIP3	: Sustainable Inclusive Pedagogical Proficiency Process
SST	: Sustainability Starts with Teachers
TVET	: Technical and Vocational Education and Training
UN	: United Nations
UNESCO	: United Nations Educational, Scientific and Cultural Organisation
UNESWA	: University of Eswatini
UNICEF	: United Nations Children's Fund
ZPD	: Zone of Proximal Development

CHAPTER 1

INTRODUCTION AND ORIENTATION TO THE STUDY

1.1 Introduction

This first chapter provides the background and context for the study's focus on the nexus between inclusive education, Education for Sustainable Development (ESD) and teacher education in a southern African context. The chapter justifies the rationale for the study and introduces the objectives, research questions, and theoretical, methodological and ethical aspects that shaped and informed the study. It also offers an overview of the chapters.

1.2 Policy Context of Inclusive Education, ESD and Teacher Education

In 2015, the United Nations (UN) recognised that education is attainable only if inclusive. This recognition pointed out a clear nexus between universal education and inclusivity. Initially, the status quo held that segregating learners based on factors such as disabilities was justifiable. However, this status quo could not hold, and a need for mainstreaming inclusive education gained momentum (O'Donoghue & Roncevic, 2020). Inclusive education advocacy has reshaped the schooling landscape globally (Winzer & Mazurek, 2023) and has brought both positive and negative educational implications.

Auspiciously, some previously segregated learners based on factors such as disability are now included in mainstream schooling systems worldwide (Forde, 2023). Adversely, inclusive education has created a demand for more resources and expertise in mainstream schools (Ainscow, 2020a). According to Swartz (2015), international policy frameworks such as the 1990 World Declaration on Education for All (Jomtien, Thailand), the Statement and Framework for Action of the 1994 World Conference on Special Needs Education (Salamanca, Spain), the 2000 World Education Forum (Dakar, Senegal), and the 2006 UN Convention on the Rights of Persons with Disabilities all advocate inclusive education. Other global policy frameworks, such as the UN's 2015 Sustainable Development Goals (SDGs), have also prioritised inclusive education (Johnstone et al., 2020).

In crafting the SDGs, the UN recognised the essence of inclusivity in socioeconomic development through education. The UN also recognised that ESD sits at the crossroads of achieving inclusive education. The SDG 4 on Quality Education aspires to “ensure inclusive and equitable quality education and promote lifelong learning for all” (UN, 2015, p. 21). In SDG 4 Target 4.7, governments and education systems are mandated to do the following:

By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development. (UN, 2015, p. 21)

The UN and Southern Africa Development Community (SADC) policy frameworks designate teachers and educators as enablers towards quality education to achieve the aspiration of SDG 4 Target 4.7 for inclusivity and sustainable development in and through education (Schudel et al., 2021). This recognition is explicitly reiterated in the SADC 2022–2030 Regional Strategic Framework for ESD (SADC, 2022). Teachers and educators are central to the implementation of SDG 4. The global policy context emphasises quality inclusive education, ESD and teacher education, which are all integral in this study. Agbedahin and Lotz-Sisitka (2019) have also argued for mainstreaming sustainability and inclusivity in the quest for quality education. Agbedahin and Lotz-Sisitka’s (2019) argument calls for the implementation of policy stipulations resulting in actions that would help educational systems move towards sustainable futures that are inclusive and relevant to the developmental needs of communities – particularly in southern African contexts where quality of education is hindered by greater inequalities and unsustainable practices (Tikly, 2019). It is this educational situation that my study focused on.

1.3 Research Problem Statement

Education for Sustainable Development (ESD), especially its emphasis on transformative education, collaborative learning, the community of practice and whole institution approaches, has the potential to advance inclusive education in teacher education practices if grounded in social reality. This implies that ESD is a potentially viable educational arena for advancing inclusivity starting from teacher training. However, this undertaking should consider the social contexts and trajectories of the education systems and practices. Such social contexts and trajectories include problems with educational funding, the social status of learners and cultural practices that shape schooling models (Odell et al., 2020). While inclusive education could be

mainstreamed in teacher education via ESD practices, there is a need to know more about the relationship between inclusive education, ESD and teacher education in Southern Africa as data on this relationship is seldom available. There is little systematic understanding of how inclusive education aligns with and is included in teacher education via ESD praxis in southern African countries. There has been some research in Southern Africa (such as O'Donoghue & Roncevic, 2020; Simui, 2022) but this has largely focused on inclusive education and ESD (see Chapter 2, Section 2.3). Thus, a clear picture of the relationship between the three notions and the potential of such relationship for pedagogical proficiency is not explicitly known.

The 2020 Global Education Monitoring (GEM) report found a need for teacher support, amongst other factors, that affect responses to challenges of inclusive education in Southern Africa (United Nations Educational Scientific and Cultural Organisation [UNESCO], 2020a). The 2020 GEM report recognised that focusing on teacher education capacity is one of the key areas needing attention for inclusive education to be more fully integrated into the southern African education systems, especially in the ESD context. This suggests that the evidence from research needs to be more explicit about whether ESD could be a viable praxis arena for mainstreaming inclusive education in teacher education in Southern Africa, hence this study.

Therefore, the problem that warranted this study is partly from the suggestions that inclusive education could be mainstreamed in teacher education via ESD praxis yet evidence to vindicate the same in the southern African context is insufficient. The problem is furthered by the 2020 GEM report which suggested that there are viable opportunities to strengthen inclusive education if teacher education is reoriented towards inclusivity and sustainability. Since there is no convincing evidence to support the supposed nexus between inclusive education, ESD and teacher education in the southern African region, the 2020 GEM report also found that indicators for monitoring inclusivity in schooling systems are underdeveloped. As such, the originality and contribution of this study lies in interrogating this supposed relationship between inclusive education, ESD and teacher education for pedagogical proficiency in a southern African context using Malawi, Tanzania and Eswatini as cases. The contribution also manifests in developing indicators for monitoring inclusivity in schooling systems which were found to be underdeveloped (UNESCO, 2020a).

1.4 Motivation and Rationale for the Study

My life and immediate family members' experiences motivated this study the most. From childhood to secondary school, my life was largely influenced by the experiences of my elder sister who is visually impaired. I witnessed how she was denied education at a regular primary school near our home and sent to a special school far from home and her peers. Slee (2011) argued that such location of special schools in remote areas was an exclusion agenda where learners with disabilities were declared uncanny to society. My sister would always express how she wished to be educated with children who could see so they could assist her. Wider discontent with and critical questioning of special schooling ignited education policymakers and advocates to rethink education systems and structures (Armstrong et al., 2009). I was not in a position to understand what my sister wished. Then, I did my secondary education at a mainstream school where learners with disabilities were included. I would always assist these learners by, for example, reading lesson notes aloud so they could write in braille because key textbooks were in print only. I then realised that my sister wished for inclusive education.

My experiences from childhood to secondary school motivated me to train as a mainstream teacher. I briefly taught in secondary school but later joined a university as a teacher educator, through which I realised that inclusive education is not only about bringing learners with different abilities together but also about teachers' experiences and values. My experiences as a teacher educator motivated me to pursue a master's study¹ in policy and practice supporting mainstream teachers to include learners with physical disabilities in the Lower Shire districts of Chikwawa and Nsanje in Malawi. Through the master's study, I realised that, as other studies found, inclusive education also involves teachers and teacher educators (see McKenzie & Dalton, 2020; Naraiian, 2021; Pugach et al., 2020). It was the experiences from my master's study that motivated me to pursue a doctoral study investigating the mainstreaming of inclusive education in teacher education practice in the context of ESD and the potential of pedagogical proficiency from this mainstreaming. Thus, my personal and educational experiences helped shape and deepen my understanding of inclusive education, forming this study's core unit of analysis and objectivity. I have previously worked in inclusive education and teacher

¹ <http://hdl.handle.net/10962/171254>

education, but ESD emerged as a new learning area I was interested in exploring through a capacity building programme I participated in at Rhodes University (see Section 1.5).

Many countries in Southern Africa, including Malawi, Tanzania and Eswatini, have performed poorly on quality of education indicators such as inclusivity (Mpontshane, 2023), sustainability (Lotz-Sisitka, 2012/2013) and teacher education (van Aswegen et al., 2023). For inclusive education, insufficient funding, negative attitudes and inadequate teacher training have worsened the situation. The 2020 Profiles Enhancing Education Reviews (PEER) for Tanzania emphasised inclusive education as a crucial element of teacher education. The rationale is that teachers are key players in implementing inclusive education and that teacher educators become catalysts in the process (UNESCO, 2020b). The 2020 PEER report highlighted that no indicators for monitoring inclusive education were found in Eswatini (UNESCO, 2020c). The PEER profile for Malawi indicated that “regular teachers have been found [unqualified] to deal with learners with special needs” (UNESCO, 2020d, p. 6), and the country lacked indicators to evaluate performances related to inclusive education. Thus, in all three countries, the implementation of inclusive education is lacking and falls behind many international and national aspirations and targets.

This situation contradicts the aims of SDG 4 (Quality Education), which mandates countries to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” and SDG4 Target 4.7 (Sustainable Development and Global Citizenship) which aspires to “ensure that all learners acquire the knowledge and skills needed to promote sustainable development”. Given this situation, this study wanted to understand and interrogate the relationship that may exist between inclusive education, ESD and teacher education in a southern African context. The rationale behind this intention was to proffer ways of improving the quality of inclusive education in Southern Africa, which is failing to meet many set milestones (Dube & Nkomo, 2023).

Thus, this study may be among the first in Southern Africa to explore the supposed nexus between inclusive education, ESD and teacher education and its potential for inclusive pedagogical proficiency. The findings and recommendations of this study may help southern African countries, including Malawi, Tanzania and Eswatini, to work on improving the shortcomings found in the 2020 GEM report and PEER profiles. The findings may also be relevant and useful to a wider community and other nations and continents.

1.5 Contextual Focus: The SST Programme, Change Projects and Cases

The study's policy and practice contexts fall within the foci of monitoring and evaluating global education trends. In 2020, UNESCO introduced an innovative approach to monitoring education using Profiles Enhancing Education Reviews (PEER), in which countries develop profiles that inform wider educational monitoring. In the same year, profiles for countries on inclusive education were introduced. These profiles produced a good starting point for a multi-national study such as this one that focused on investigating the mainstreaming of inclusive education in teacher education via ESD practices in three southern African countries: Malawi, Tanzania and Eswatini. At the same time, UNESCO is supporting countries to mainstream ESD through teacher education which led to the UNESCO ESD Sustainability Starts with Teachers (SST) capacity building programme. Countries involved in UNESCO's SST programme in the southern African region were Angola, Botswana, Eswatini, South Africa, Lesotho, Malawi, Tanzania, Namibia, Mozambique, Zambia and Zimbabwe, grouped into four cohorts:

- Year 1 (2019): Zimbabwe, Botswana and Namibia
- Year 2 (2020): Zambia, South Africa and Lesotho
- Year 3 (2021): Tanzania, Malawi and Eswatini (focus for this study – Figure 1.1)
- Year 4 (2022): Mozambique and Angola

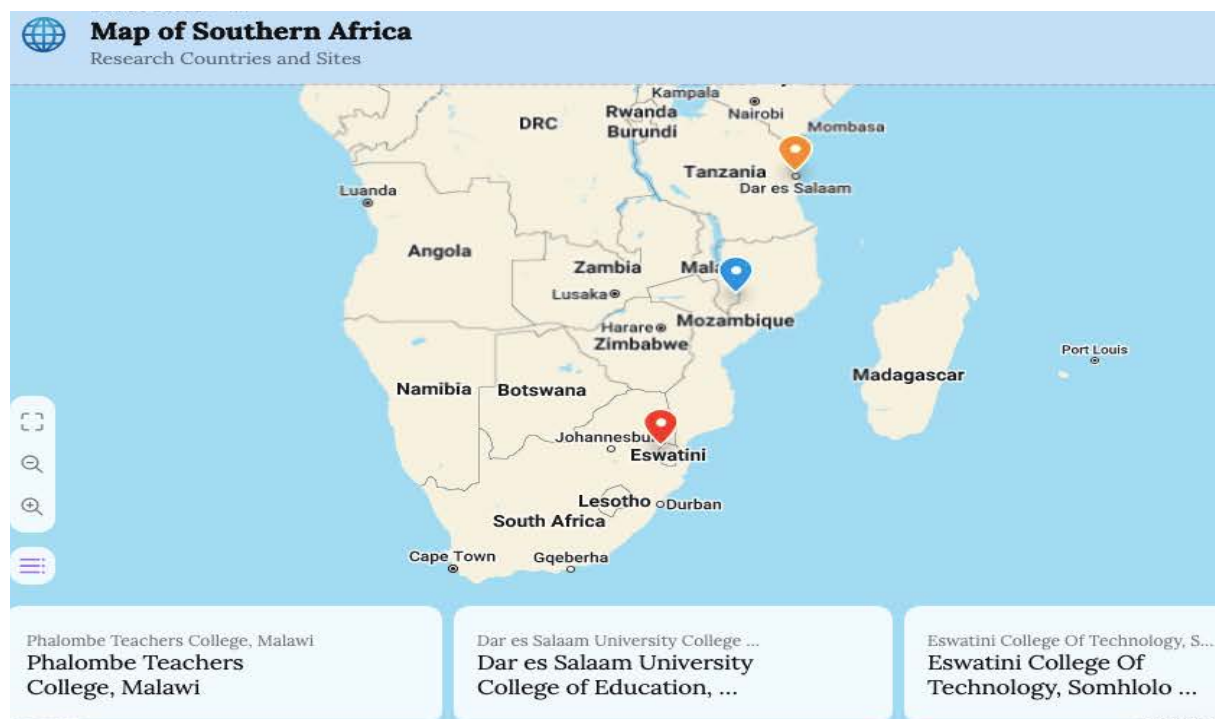


Figure 1.1: Map of Southern Africa showing the three research countries and sites

The South African Research Chairs Initiative (SARChI) of Global Change and Social Learning Systems at Rhodes University implemented the SST² programme to which this study is located, emanating from and contributes to. The SST programme was structured and implemented through five learning actions (see Lotz-Sisitka et al., 2019):

- *Learning Action 1: ESD Policy, Context and Competences Review*
- *Learning Action 2: Sustainable Development Goals and Critical Issues*
- *Learning Action 3: Transformative Learning and Learning Environments*
- *Learning Action 4: Design and Try Out Assessment of Significant Learning in ESD*
- *Learning Action 5: Monitoring, Evaluation and Scaling for Impact*

The SST programme was developed as an online course centred around a Change Project. All the participants in the programme were registered for an online course to improve their competencies on issues regarding ESD in teacher education practices (van Staden & Lotz-Sisitka, 2023). While doing the online course, the SST participants formed communities of practice in their institutions to work on a Change Project. In both the online course and the Change Project, the participants received constant support from the UNESCO Regional Office for Southern Africa (ROSA) and Rhodes University's Environmental Learning Research Centre (ELRC) through webinars, policy dialogues and monitoring visits to their countries and institutions (van Staden & Lotz-Sisitka, 2023). The SST programme focused on teacher education in the ESD context.

Thus, for this study, the SST programme was the context where cases on mainstreaming inclusive education in teacher education practice for pedagogical proficiency via ESD Change Projects could be developed. Since the SST programme was for teacher educators, it allowed me as a researcher to engage with the educators on the study's objectives, bearing in mind that ESD has been designated as a viable praxis arena for promoting inclusive education, such as SDG 4 and Target 4.7 aspire to achieve (Leicht et al., 2018). Thus, within the larger SST programme and its Change Projects, this study identified teacher educator communities of practice working on inclusivity issues as part of the teacher education activities via ESD (see Chapter 4 Section 4.5).

² <https://sustainabilityteachers.org/>

As Lotz-Sisitka et al. (2019) indicated, the ESD Change Projects sat at the centre of the SST programme’s five learning actions. As such, the SST Change Project took an action learning cycle with five steps, as shown in Figure 1.2 below.



Figure 1.2: Action learning cycle of an SST Change Project

Source: Lotz-Sisitka et al. (2019, p. 21)

The uniqueness of the ESD Change Project model as part of programme implementation is that participants develop capacity and agency to transform their practices. For example, in the doctoral study titled *Exploring change-oriented learning, competencies and agency in a regional teacher professional development programme’s change projects*, Mandikonza (2016) found that “the Change Project provided course participants with the opportunity to engage with their own practice and particularly their competences and capabilities through its mediatory tools” (p. ii). Mandikonza observed that agency requires stimulus for the participants to realise their potential for transformation and change. In essence,

the Change Project enabled participants to reflexively work on their practice and shift from normalised education practices to show characteristics of education for sustainable development, in other words from the ‘habitus’ of education to a new ‘habitus’ and eventually the ‘habitus’ of [ESD]. (Mandikonza, 2016, p. 14).

With this potential of the ESD Change Project model, the SST programme was designed with the vision that if teacher educators are capacitated in ESD issues, they could potentially contribute to improving the quality of teacher education (Lotz-Sisitka et al., 2019).

Agbedahin’s (2016) doctoral study, titled *A morphogenic and laminated system explanation of position-practice systems and professional development training in mainstreaming education for sustainable development in African universities*, also explored the potential of the ESD Change Project model. In this research, Agbedahin explored several ESD Change Projects in African universities and explained their potential in reshaping higher education practice concerning ESD. The study reported that the “participants were required to define, design and develop their own Change Projects based on needs, tasks and responsibilities in their daily work schedules” (Agbedahin, 2016, p. 28). Agbedahin’s observation resonates with what Mandikonza and Lotz-Sisitka (2016) found, that “by conducting the change project, participants showed commitments to learning from context while using and promoting teaching and learning methods that are critical, collaborative, and experiential while foregrounding values” (p. 126).

Thus, this study opted to investigate the mainstreaming of inclusive education in teacher education practice through ESD Change Projects because of their potential to build the capacity and agency of teacher educators as the SST programme intended. The SST programme was officially phased out in early 2023 with a legacy impact on teacher education praxis on ESD issues in Southern Africa. This impact is evident through the ESD Change Projects that were catalysed via the programme. Although the programme has phased out, the Change Project model has allowed the participants to continue working on their Change Projects to scale them up for further impact. Thus, the ESD Change Project model has mechanisms for ensuring the sustainability of the ESD initiatives that participants start (Mandikonza & Lotz-Sisitka, 2016). Based on their learning from the SST programme, some institutions and teacher educators have conceptualised new Change Projects that involve the wider community, and some have introduced new teacher education courses and programmes focusing on sustainability.

Out of the 41 UNESCO/Rhodes University's SST Change Projects in Malawi, Tanzania and Eswatini (see Chapters 5–7 respectively), this study focused on three, although other cases were initially involved. The first case was from Phalombe Teacher Training College (PETTC) in Malawi. PETTC initiated the *Pamtondo* ESD Change Project (see Chapter 5), where participants developed a wooden machine to recycle waste paper into materials for inclusive teaching and briquettes for cooking. The project also aimed to promote entrepreneurial skills and provide sustainable financial security among pre-service teachers, including those with disabilities. Teacher educators collaborated with pre-service teachers, applying knowledge from various disciplines to address critical societal issues within the SST programme. However, the initial orientation of the Change Project revealed a lack of explicit inclusivity, leading to the need for formative interventionist research to address contradictory layers. The formative intervention navigated between the participants' existing knowledge and their innovation potential. The wooden briquette machine had limitations, prompting the development of a new, disability-friendly metal machine that produced less smoky and more efficient briquettes from various materials. This approach aligned with Vygotskian principles (see Chapter 3, Section 3.2.2), demonstrating that with support, individuals can surpass their concrete knowledge to accomplish tasks beyond their initial capabilities, thus strengthening the Change Project's sustainability and inclusivity goals.

The second case was from Dar es Salaam University College of Education (DUCE) in Tanzania. DUCE conceptualised the *Tubadilike* Change Project (see Chapter 6), which aimed to transform the mindset of teacher educators regarding pre-service teachers with disabilities and their access to Information and Communication Technology (ICT). The project, named after the Swahili word for 'Let's Change', observed a heavy reliance on readers and notetakers and outdated typewriters among pre-service teachers with disabilities at DUCE. Consequently, *Tubadilike* focused on empowering both pre-service teachers and teacher educators to integrate ICT as a learning strategy, promoting inclusive education in teacher training through ESD praxis. Despite the project's emphasis on teacher education and inclusive education, the explicit incorporation of ESD was lacking. To address this gap, the formative interventionist research targeted two sustainability areas: the reliance on readers and notetakers and the problem of waste paper and electronics. The project highlighted the financial challenges associated with employing a large number of readers and notetakers and proposed that developing ICT skills among pre-service teachers with disabilities could reduce the need for such support, ensuring financial sustainability and minimising paper and electronic waste.

The third case was from Eswatini College of Technology (ECOT) in Eswatini. This case involved an ESD Change Project named *Vusetela* (see Chapter 7) and aimed to renovate campus infrastructure for better accommodation of teacher educators and pre-service teachers with disabilities. Despite specialising in training commerce and ICT teachers, ECOT faced accessibility issues in lecture and administrative rooms. The *Vusetela* project addressed inclusivity concerns by modifying infrastructure to create an environment conducive to both teacher educators and pre-service teachers with disabilities. Recognising the strength of inclusivity and sustainability dimensions through infrastructure accessibility, the participants realised the need to strengthen the connection to teacher education praxis. The formative interventionist research in *Vusetela* was introduced to enhance the training component, leading to curriculum alignment and modification by the teacher educators across the institution.

1.6 Conceptual Focus

Figure 1.3 below illustrates the perceived connectivity of the key concepts in this study and the focus on pedagogical proficiency which realises the connection in practice.

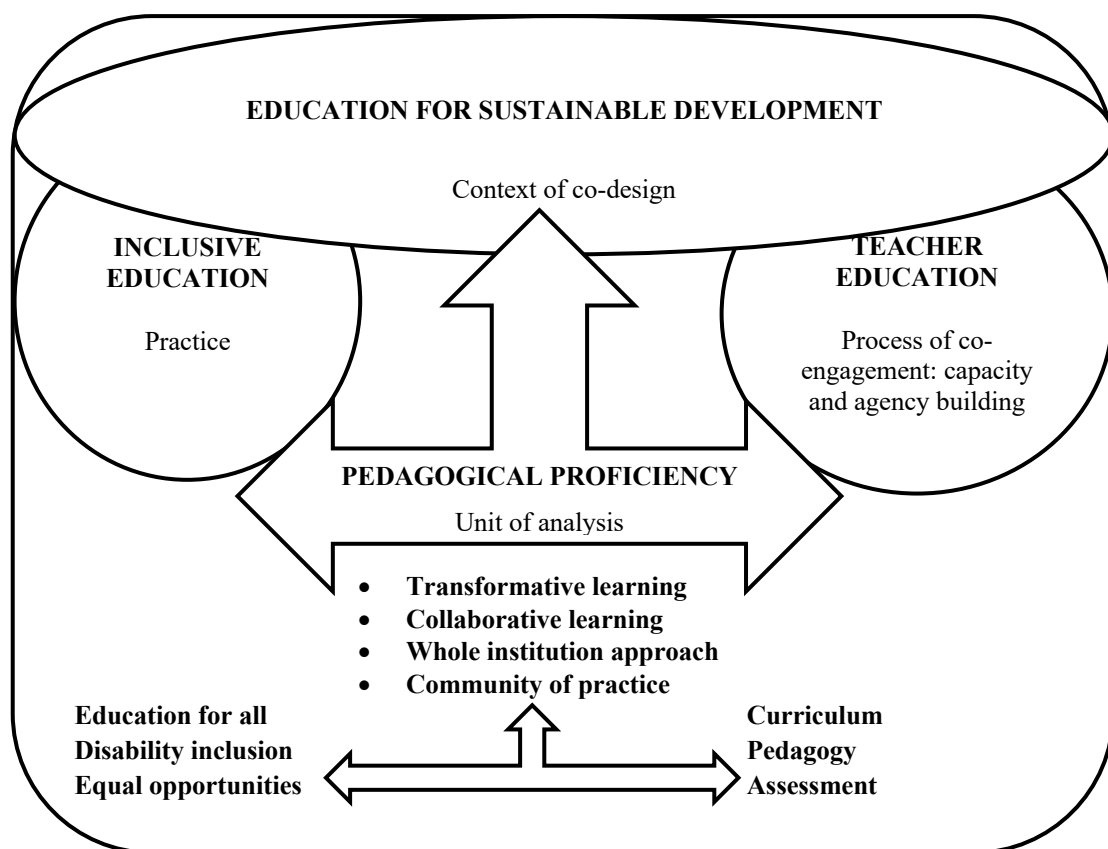


Figure 1.3: Conceptual framework

1.6.1 Inclusive education

Inclusive education is understood as a system that considers the abilities of all learners in epistemological access regardless of their differences (Mbewe et al., 2021). Physical and ontological access are also relevant and applicable to ensuring inclusive education and learner success (de Souza, 2020). Thus, inclusive education focuses on learners and overcoming barriers that prevent the system from addressing their needs (Ainscow, 2020b; Gosbell, 2021). This focus has implications for addressing weaknesses in the education system influencing inclusive education. Inclusive education provides learners with equal educational opportunities as their peers in the same learning environment (Graham, 2020; Slee, 2018; Walton, 2018).

Largely, the discourse on inclusive education is associated with disabilities, but it is wider, including such foci as gender, language, age, race and social status (Koutsouris et al., 2020; Mitchell, 2005; Thomas & Macnab, 2019). Inclusive education advocacy started within the theoretical substratum of the social model of disability (de Beco, 2018; Cluley et al., 2020; Spandagou, 2020). However, a more encompassing definition of inclusive education was offered in UNESCO's (2009) *Policy Guidelines on Inclusion in Education* as "a process of strengthening the capacity of the education system to reach out to all learners" (p. 8). Hence proactively providing physical access, ontological and epistemological access, and ensuring the ultimate success of all learners (leaving no child behind).

My study's focus in terms of inclusive education was limited to disability to manage the scope of Change Projects in the SST programme from the three southern African countries: Malawi, Tanzania and Eswatini. Thus, as much as I focused on disabilities as a dimension of inclusivity, the concept itself is more encompassing, and its use in this study does not imply a generally accepted delineation. With limited scope, my study defines inclusive education as a transformative system of mainstreaming and supporting disability inclusion in regular schools where all learners are placed regardless of their disabilities. This focused definition nonetheless agrees with UNESCO's (2009) definition. Since the study focused on investigating the mainstreaming of inclusive education in teacher education practices for pedagogical competencies via ESD Change Projects, this definition of inclusive education helped me as a researcher to interrogate any transformative principles and practices that could be borrowed from ESD praxis to enhance the quality of teacher education as far as inclusive education is concerned.

1.6.2 Teacher education

Teachers need to be acquainted with teaching and learning theories and methods before teaching others (Grossman, 2021; Hennissen et al., 2017; Waks, 2020). One crucial element in teacher education is the requirement that teachers understand how learning occurs (Darling-Hammond & Oakes, 2019; Gilakjani, 2012; Weinstein et al., 2018). There is also a need for teachers to understand their learners, the education systems, policies and guidelines and how learners prefer to learn (audio, visual, tactile, kinesthetics, etc). The contemporary influence of artificial intelligence on curriculum development, quality teaching, learning, feedback and assessment practices are equally crucial in teacher education.

American philosopher John Dewey is attributed with initiating the philosophical underpinning of teacher education and propounded that teacher education is not merely theoretical. Instead, teacher education is also practical. A more recent understanding of teacher education is based on both theory and practice and the teacher's pedagogical content knowledge (Waks, 2020). Grossman (2021) defined teacher education as an education system whereby individuals are theoretically and practically prepared to teach diverse learners along with acceptable norms, policies and codes of conduct. My study understands teacher education as a philosophical, theoretical and practical process of preparing individuals for inclusive pedagogical proficiency in order to affirm inclusive education for learners with disabilities.

1.6.3 Education for Sustainable Development

Education for Sustainable Development (ESD) originates from and aligns with the concept of 'sustainable development'. Sustainable development entails "development that meets the needs of the present without compromising the ability of the future generations to meet their own needs" (UNESCO, 2012, p. 1). Importantly, the focus is on "thinking about a future in which environmental, social and economic considerations are balanced in the pursuit of development and an improved quality of life" (UNESCO, 2012, p. 1). Consequently, ESD "empowers learners to take informed decisions and responsible actions for environmental integrity, economic viability and a just society, for present and future generations, while respecting cultural diversity" (UNESCO, 2014, p. 12). To give it a practical meaning, Lotz-Sisitka et al. (2017) argued that ESD should be discourses as a learning process. This means that ESD should reflect collaborative learning, co-learning and human development (Agbedahin & Lotz-Sisitka, 2019). For this study, ESD also means reshaping the education landscape in a

transformative and responsible manner to encompass issues of disability inclusion into sustainability education in teacher education and eventually schools.

1.6.4 Pedagogical proficiency

Klemenz et al. (2019) highlighted that “the current discourse on the quality of teacher education focuses on how future teachers acquire professional competence and which role higher education plays in this context” (p. 222). This means the professional competence of the teachers is key to improving the quality of education. Thus, pedagogical proficiency is about the teaching competencies, dispositions and skills that teachers develop from training and sustain through practice and professional development (Creemers et al., 2013). The term ‘proficiency’ originates from the Latin word *proficere*, meaning “accomplish, make progress, be useful”³. This entails that gaining proficiency means gaining a skill, becoming more competent, and being able to apply oneself effectively.

Pedagogy is a well-known educational term and refers to the science and practice of teaching or the principles and methods of teaching. When I use the term ‘pedagogical proficiency’ in the context of inclusivity, I mean that teachers and teacher educators are becoming more skilful and competent at integrating disability inclusivity principles into mainstream education settings. As Stronge (2018) observed, pedagogical proficiency is important for supporting learning because it involves a blend of knowledge, skills, attitudes and dispositions that enable teachers to be effective and impactful in their professional practices. In this study, pedagogical proficiency also refers to the knowledge, skills, dispositions and competencies that teachers acquire during teacher training like the SST programme. Their participation in such training programmes propel or catalyse sustainable practices such as the implementation of ESD Change Projects that orient teachers’ perspectives towards disability inclusive education.

1.7 Purpose, Objectives and Questions

The study employed a co-design perspective to conduct more collaborative research *with* the SST participants from Malawi, Tanzania and Eswatini. As such, the study’s purpose, objectives

³ <https://www.vocabulary.com/dictionary/proficiency>

and questions were crafted from and resonate with co-design perspectives (see Chapter 4). The purpose, objectives and research questions for the study are outlined below.

1.7.1 Purpose of research

The purpose of the study was:

- To understand how teacher educators in Southern Africa can mainstream inclusive education in teacher education for pedagogical proficiency through ESD and how they can be supported to do this.

1.7.2 Specific objectives

The study intended to achieve the following specific objectives:

1. To develop understandings of inclusive education and ESD in teacher education towards pedagogical proficiency in three southern African countries: Malawi, Tanzania and Eswatini.
2. To identify areas that need strengthening for teacher educators to mainstream inclusive education in teacher education for pedagogical proficiency through ESD.
3. To co-develop, with selected teacher educators, ways to strengthen mainstreaming inclusive education in teacher education towards pedagogical proficiency via ESD.
4. To generate indicators that can be used to monitor and evaluate inclusive education mainstreaming and inclusive pedagogical proficiency via teacher education in ESD context.

1.7.3 Main research question

The following was the main research question that guided and framed the study:

- How can teacher educators mainstream inclusive education in teacher education practices for pedagogical proficiencies via ESD change projects in Southern Africa?

1.7.4 Specific questions

Specifically, the study intended to answer the research questions below. These questions are more than just a restatement of the objectives. Instead, they are the second level of the multi-layered perspective of the study's focus and unit of analysis. Thus, the research objectives

outlined above can be designated as the first layer of the study's focus, and the questions below as the second layer of focus:

1. What is the current status quo of, before and after the SST programme, inclusive education mainstreaming in teacher education in Malawi, Tanzania and Eswatini in the context of ESD?
2. How can teacher educators' existing knowledge, including the knowledge gained as a result of SST programme, potentially be expanded through formative intervention engagements for mainstreaming inclusive education in teacher education through ESD Change Projects?
3. What insights into the strengthening of mainstreaming of inclusive education in teacher education emerge; specifically, how can pedagogical proficiency be improved for teacher educators and what are the implications of this?
4. From these inquiries (1–3 above), is it possible to surface indicators that can inform the monitoring and evaluation of inclusive education mainstreaming to contribute to the field of teacher education?

1.8 Theoretical Framework: An Overview

The study was theoretically framed within the foci of human development and learning (see Chapter 3). To support teacher educators in Malawi, Tanzania and Eswatini, as cases in Southern Africa, the study investigated the mainstreaming of inclusive education in teacher education practice for pedagogical proficiency via ESD Change Projects. To achieve this, I employed Urie Bronfenbrenner's bioecological systems theory of human development (2005) and Lev Vygotsky's sociocultural theory of learning (1978) as a theoretical framework which provided a cognitive tool for co-engagement with the research participants. In both theories, the departure point is that an individual develops and learns from interactions within their social and cultural contexts, as elaborated in Chapter 3. Bronfenbrenner's theory offers a theoretical lens for examining systems that influence inclusivity in teacher education. For example, one of the study's objectives was to identify areas that need strengthening for teacher educators to mainstream issues of inclusive education in their practices. Thus, Bronfenbrenner's bioecological systems theory (2005) offered mechanisms for identifying these areas from the participants' responses and practices. However, Bronfenbrenner's theory did not go far in analysing how teacher educators' knowledge of learning could be expanded, hence I drew on Vygotsky's sociocultural theory of learning (1978). Vygotsky's theory offered ways of looking

into strategies the participants could employ to improve their practices from SST Change Project activities. Thus, the sociocultural theory was employed to look into potential ways of learning what is not already there, i.e. expansive learning (Engeström, 2011). The third chapter expands on and motivates these theoretical choices in the study.

1.9 Methodological Design: An Overview

This study used a formative interventionist design where Change Projects in the SST programme from Malawi, Tanzania and Eswatini became case studies for co-design, co-engagement and reflexive analysis. I was part of the SST programme as both a participant and a coordinator and this study was part of my intellectual existence there (see Section 1.11 on my positionality). Together with the insider formative interventionist design, the study employed a qualitative approach where document review, interviews, observations, workshops and reflective journals were used to generate data. The whole research design and methodological approach were underlaboured by Bhaskarian critical realist philosophy and guided by Engeström's expansive learning trajectory which provided ontological suppositions and analytical flow for the study, respectively. The critical realist ontology complemented the theoretical framework of Bronfenbrenner and Vygotsky in interrogating the nexus between inclusive education, ESD and teacher education. Methodological choices and ethical considerations are detailed in the fourth chapter.

1.10 Potential Impact of the Research

The study aims to impact several educational areas and at different levels: myself as a researcher, the participants as collaborators, theoretical and methodological contributions, and education policy and practice. From my perspective, the study was partly a response to UNESCO's 2020 PEER profiles from which I intended to contribute to developing inclusive, quality education in Malawi, Tanzania and Eswatini. I anticipate that this contribution would broaden my knowledge sphere in the southern African context. For the participants, the study has the potential to help them and other teacher educators not involved in the research to bring the issues of inclusive education through pedagogical proficiency to the centre of discourses on ESD quality indicators and give practical meaning to UNESCO's discourse on "inclusive, quality education" for Education Agenda 2030 and African Union's Agenda 2063.

Theoretically, the study has the potential to contribute to theory development for inclusive education in teacher education via ESD practices in a southern African context. Studies that attempted to connect inclusive education, ESD and teacher education have emphasised the importance of social contexts and trajectories (see Nolet, 2013; O'Donoghue & Roncevic, 2020). Thus, this study has theoretically delineated such social contexts and trajectories for inclusive education in Southern Africa. Methodologically, the research co-design, which comprised critical realist ontology and an insider formative interventionist approach, can contribute to research praxis development using a contextually dynamic model for education research in Southern Africa and beyond. In the same vein, regarding education policy and practice, the study can inform inclusive education policies and practices in the three southern African countries and the entire region. The actual contributions are synthesised and reflected on in Chapter 8.

1.11 Researcher Positionality

Methodologically, the study worked with a qualitative approach to research (see Chapter 4). This methodological decision came with implications for my positionality in the study. Positioning oneself is a key feature of qualitative research (Berkovic et al., 2020; Bourke, 2014; Cohen et al., 2018). This involves taking account of the researcher's role and position in the research and its implications for interactions with the participants and the study process. As such, self-reflexivity in research should be a thread throughout the study (Watt, 2007).

Foremost, I situated myself as an insider but took the role of a facilitator within the formative interventionist research design. This design meant that I was part of the research context while maintaining participants' autonomy in Change Project areas where they needed support within their practices (Berkovic et al., 2020; Britton, 2020; Thurairajah, 2019). Thus, as I positioned myself as an insider researcher, this did not remove the participants' choices in implementing the Change Projects. All I did was support the areas they chose while focusing on my research objectives and questions (see Chapters 5, 6 and 7).

I was an insider researcher because I enrolled in and studied the SST course. In addition, I assisted with cluster meetings on this SST programme. Thus, just like the study participants, I was equally acquainted with the intentions of the SST programme. This situation may, *prima facie*, generate a feeling of bias on my part, which comes from assumptions of objectivity. In my case, I was dealing with inter-subjective objectivity. Being part of the course enabled me

to be well-informed about SST and the study context. As such, I interacted with the participants from a closely associated perspective while ensuring and safeguarding their rights, anonymity, autonomy, respect and confidentiality in the research, and keeping rigorous records to enhance the credibility of the research process.

I have also been a teacher educator at a university in Malawi. So, just like me, the participants were teacher educators involved in the SST programme from selected institutions in Malawi, Tanzania and Eswatini. Therefore, instead of my insider position in the research bringing bias, I took account of inter-subjectivity and shared experiences with the participants and sought to ethically, clearly and meaningfully interact with them as we co-designed and co-engaged inclusive education practices in the ESD Change Project activities and the SST programme. Importantly, as Mukwambo et al. (2023) advised, as an insider formative interventionist researcher, I reflexively engaged throughout the research process by continuously reflecting on my actions in the study. This reflexivity was achieved by maintaining a reflective research journal, among other ways. I explain the insider formative interventionist positionality and other methodological matters further in the fourth chapter.

1.12 Overview of Chapters

This thesis is structured into eight chapters as follows.

Chapter 1: Introduction and orientation to the study

This first chapter is an introductory one which provides the context for the study. The chapter also outlines the study's purpose, objectives and research questions. This chapter offers insights into the research problem that although ESD has been designated as a viable platform for mainstreaming inclusive education, there needs to be more evidence to support the same assertion in a southern African context, especially concerning teacher education praxis. This chapter also introduces the four key concepts used in this study: inclusive education, ESD, teacher education and pedagogical proficiency.

Chapter 2: Inclusive education, ESD and teacher education contexts for pedagogical proficiency

This chapter reviews the literature related to the study objectives. The review is subdivided into four sections. The first section reviews the literature on the histories and understandings of

inclusive education, ESD, teacher education and pedagogical proficiency globally and in a southern African context. The second section focuses on literature about areas that need strengthening for teacher educators to mainstream inclusive education in teacher education programmes via ESD practices. In the third section, the review focuses on strategies that teacher educators may develop to mainstream inclusive education in teacher education via ESD praxis. The last section reviews the literature on indicators for monitoring and evaluating inclusive education in teacher education programmes and practices across ESD contexts. The main thrust of this chapter is that although some research studies attempt to connect inclusive education, ESD and teacher education to pedagogical proficiency, the evidence for doing the same in a southern African context needs to be concretely and explicitly revealed through research.

Chapter 3: Integrative theoretical tools for pedagogical proficiency research

The third chapter focuses on the theoretical framework for the study. This chapter explains and motivates the theoretical choices and applications. The chapter details Urie Bronfenbrenner's bioecological system theory of human development (2005) and Lev Vygotsky's sociocultural theory of learning (1978) and traces their developing threads. The employment of the theoretical arguments in the study is discussed in this chapter. Importantly, the chapter argues that human development and learning processes shape inclusive education, leading to the focus on pedagogical proficiency. As such, the chapter justifies that employing the bioecological and sociocultural theories was necessary to investigate teacher educators' practices with specific emphasis on pedagogical proficiency via ESD Change Projects in three southern African countries: Malawi, Tanzania and Eswatini.

Chapter 4: Formative interventionist research design and methodology

The fourth chapter reports on the research design and methodology. This chapter explains why the study used a case study design with an insider formative interventionist approach. Methodological choices such as qualitative data generation are justified in this chapter. The chapter also explains the rationale behind working with critical realism as a philosophical underlabourer and expansive learning as a methodological torch. These offered a relational ontology with the power to challenge the binary opposition of self/other that has institutionalised exclusion in education systems by othering learners with disabilities, creating the same trajectory of exclusion in teacher education. As such, I argue in this chapter that

critical realism brings into discourse the new and possible ontological spaces that require teachers and educators to embrace and sustain inclusive education within mainstream institutions. I further argue, via an expansive learning process, that methodologically, the transformative orientations of ESD (such as transformative learning, collaborative learning, whole institution approaches and community of practice) provide concrete strategies for mainstreaming inclusive education in teacher education practice for pedagogical proficiency when discoursed from human development perspectives and a relational ontology.

Chapter 5: Supporting inclusivity in ESD teacher education: Malawi

The fifth chapter is a case analysis of supporting inclusivity in ESD in teacher education practice in Malawi. In Malawi, I originally worked with three institutions involved in the SST programme, focusing on inclusivity in their ESD teacher education Change Projects. For the sake of research management and the deep focus of the study, I chose to analyse one institution where the full research process took place. Thus, this chapter reports the research process at Phalombe Teacher Training College (PETTC) and the findings that emerged from co-designing and co-engaging with the participants through various data generation methods. In this case, participants chose to be supported more on the inclusivity (inclusive education) aspect.

Chapter 6: Supporting sustainability in ESD teacher education: Tanzania

In the sixth chapter, I do a case analysis of supporting sustainability in ESD in teacher education practice in Tanzania, where I originally worked with three institutions but ended up with one for in-depth focus and scope. Thus, the chapter focuses on the research process I undertook with SST participants at the Dar es Salaam University College of Education (DUCE). The DUCE case followed the same research processes as in Malawi but a few adjustments were made to suit the circumstances of the context. In this case, participants chose to receive more support on the sustainability (ESD) aspect.

Chapter 7: Supporting training in ESD teacher education: Eswatini

The seventh chapter focuses on the case analysis of supporting training in ESD in teacher education practice in Eswatini. In Eswatini, I initially engaged with three institutions but only ended up engaging in-depth with one institution needing more support on the training aspect of their SST ESD Change Project. Thus, this chapter reports on the research process with SST participants at Eswatini College of Technology (ECOT). As ECOT is a polytechnic institution,

it trains secondary school teachers, especially in commerce and ICT. The research process at ECOT was the same for Malawi and Tanzania but flexibility was employed to adjust to the institution's context. In this case, participants chose to get more support on the training (teacher education) aspect.

Chapter 8: Mechanisms for actualising inclusive pedagogical proficiency

The eighth chapter discusses the emerging regional knowledge on the nexus of inclusive education, ESD and teacher education for pedagogical proficiency in the southern African context. The discussion engages cross-case and cross-country findings from Malawi, Tanzania and Eswatini. In this chapter, an argument emerges that inclusive education can be mainstreamed in teacher education if developed via pedagogical proficiency in ESD in the southern African context, but the process would require teacher educators to use transformative pedagogical mechanisms for pre-service teacher training. This chapter proposes the Sustainable Inclusive Pedagogical Proficiency Process (SIP3) model, which is a research framework emerging from this study. The SIP3 model may enable further research with teacher educators to orient pre-service teachers towards inclusivity in which understandings of inclusive education are grounded in sustainable pedagogical principles, where areas needing strengthening are checked, strategies for inclusivity are promoted, and monitoring and evaluation of inclusivity are encouraged. The chapter also presents key findings on investigating the mainstreaming of inclusive education in teacher education via ESD praxis, and suggestions are made for further research in the same foci. The chapter ends by motivating why future research in inclusive education, ESD and teacher education may be more proficient if practised using models such as the SIP3, which manifests in a confluence of sustainability, development and learning.

1.13 Conclusion

This first chapter has introduced key aspects relevant to the study. As indicated in this chapter, the study sought to focus on investigating the mainstreaming of inclusive education in teacher education practice for pedagogical proficiency in the context of ESD in a southern African context. This focus was undertaken through UNESCO/ Rhodes University's SST programme, a capacity building programme for teacher educators in Southern Africa. The study focused on selected SST ESD Change Projects in Malawi, Tanzania and Eswatini. The next chapter reviews the literature related to the study.

CHAPTER 2

INCLUSIVE EDUCATION, ESD AND TEACHER EDUCATION CONTEXTS FOR PEDAGOGICAL PROFICIENCY

2.1 Introduction

This chapter reviews the literature on mainstreaming inclusive education in teacher education for pedagogical proficiency in the context of Education for Sustainable Development (ESD) in Southern Africa. The review is structured into two main sections. The first section reviews international literature, followed by sub-Saharan African literature on the history of inclusivity in teacher education and ESD. The second section narrows the review to Southern Africa, providing a synthesis of this into the study direction by focusing on understanding inclusive education and ESD, highlighting areas that need strengthening for teacher educators to mainstream inclusive education in teacher education programmes via ESD practices, identifying strategies teacher educators can develop to mainstream issues of inclusive education in teacher education programmes via ESD practices, and monitoring and evaluating inclusive education across contexts in teacher education praxis across ESD contexts.

The search for the literature took a targeted approach whereby advanced search on online research communication platforms, such as Google Scholar, was used. Key search terms were inclusive education, ESD, teacher education and pedagogical proficiency. In some cases, the search was limited to specific geographical regions, i.e. sub-Saharan Africa and Southern Africa. Additional searches were done on other platforms, such as African Journals Online and Rhodes University's library search. In each search, the first 50 papers were skimmed through to identify the ones that were more relevant to the study. A table⁴ with four columns was used to capture information from the papers and guide the review. The first column contained the paper's full reference details, the abstract and the link to the full paper (where available). The second column captured my general understanding of the paper after reading it. The third column was used to detail the argument, methodology and key findings of the paper. The fourth

⁴ <https://doi.org/10.21504/RUR.26426032.v1>

column contained the analysis of the paper's information in relation to this study and indicated the sections where the paper would be more relevant, e.g. the history of inclusivity in teacher education, the monitoring and evaluation of inclusive quality teacher education, etc.

2.2 History of Inclusive Education in Teacher Education and ESD

Graham (2020) stated that “the history of inclusive education varies across the world. Some countries are just discovering the concept for the first time. Others, such as the United States, the United Kingdom and Australia, have been engaging with its foundational concepts since the 1970s” (p. 1). This situation means that countries worldwide are not on the same par with inclusive education implementation. The situation is also attributed to the cultural-historical contexts of these countries. For example, in the United States, inclusive education focuses more on disability and special needs, but the aspiration of inclusion in education is marred by a lack of specific attention to other factors, such as race, ethnicity and language (Artiles & Kozleski, 2007). As such, it was mostly African Americans (race-wise) with disabilities, for example, that were placed in special schools. Stainback and Smith (2005) also gave a historical account of inclusive education in the United States. They largely observed that the courts have been at the forefront of dismantling the special education philosophy towards inclusivity. They cite legal milestones, such as the 1954 *Brown v. Board of Education* case, in which the Supreme Court ruled against racial segregation in education. This was eventually extended to individuals with disabilities, and policy efforts emerged to actualise the court judgements, including the Individuals with Disabilities Education Act. In the United Kingdom and Australia, policy efforts and practice implementation have come a long way in the move towards inclusive education (Liasidou, 2012). In these countries, inclusive education originates from human rights perspectives following protocols such as the UN declarations.

In Africa, the history of inclusive education speaks to the region's colonial past. Initially, the education of individuals with disabilities was in special schools facilitated by church missionaries. Research studies such as Swartz (2015), Musara (2019) and Pather (2019) gave accounts of policy developments on inclusive education in Africa influenced by international, regional and national frameworks. Most of these policy frameworks are discussed through document review in Chapters 5–7. For example, Pather (2019) pointed out that tangible developments that spearheaded inclusive education in Africa can be traced to the Salamanca conference in 1994, where parties reiterated the essence of educating all learners together and offering necessary support services.

In Southern Africa, the discourse on inclusive education and its histories are closely linked to decoloniality and, in the case of South Africa, the undoing of racial discrimination. Muthukrishna and Engelbrecht (2018) explained how inclusive education implementation has unfolded in Botswana, Namibia and South Africa. In a nutshell, their findings suggest that, unlike the United States, where the trajectory towards inclusive education is shaped by racial and linguistic differences within the disability discourse, socioeconomic factors in the southern African region determine governments' capabilities to implement inclusive education.

With contemporary societies marred by greater inequalities and risky environments, education is seen as one sure way of (re)negotiating the spaces of action towards transformation and change. As such, teacher education needs to be transformed to align to and resonate with frameworks such as the Education Agenda 2030, which puts inclusivity and sustainability at the core of indicators of quality education (Odell et al., 2020). Looking at the literature on inclusive education and teacher education, the evidence reveals that this problem is related to the need for more transformative capabilities for teacher educators to prepare teachers for inclusive pedagogical proficiency. Past research studies (such as Muthukrishna & Engelbrecht, 2018; McKenzie & Dalton, 2020) found that teachers focus on disabilities instead of epistemological access and transformative approaches. Some scholars (such as Molbaek, 2018; Narayan, 2021; Pugach et al., 2020) traced the history of this situation to inadequate teacher education.

Much as inclusive education focuses on the learner, the essence of teachers in the process cannot be overlooked (Boyle et al., 2020; Adjei-Boateng & Cobbinah, 2021; Mitchell & Sutherland, 2020). In this regard, Swartz (2015) conducted a qualitative research study into inclusive education support systems available to learners experiencing mild intellectual barriers to learning in selected South African primary schools. Some of the results from Swartz's (2015) study indicated that, although teachers are crucial in the implementation of inclusive education, they do not understand the rationale behind it. Supposedly, the teachers involved in Swartz's (2015) study did not know (presumably from teacher training) the essence of bringing learners with special educational needs or disabilities into regular schools. Yet, for inclusive education to succeed, scholars (such as Lindacher, 2020; Sandoval et al., 2021) argue that mainstream teachers must be well acquainted with effective inclusivity practices.

Thus, the history of inclusive education in teacher education shows that teacher education practice has been slow in reorienting itself towards inclusivity. If teachers focus on disabilities

instead of creating learning spaces for the learners, as Muthukrishna and Engelbrecht (2018) found, the chances for inclusive education to succeed are minimal. Therefore, transformative approaches are needed to actualise the aspirations of inclusive education in the education system. Such efforts have seen inclusive education delineated in the context of ESD to put much emphasis on pedagogical proficiency. Historically, these efforts have been undertaken outside of teacher education praxis, yet global reports, such as the 2020 GEM report, recognised teacher education to be at the centre of quality education, and ESD could be a catalyst for the process.

Socioeconomic values and cultural differences shape how inclusive education and ESD shape policy and practice (O'Donoghue et al., 2018). For example, Nolet (2013) conducted a research study examining the vision, challenges and implementation that shape teacher education and ESD in the United States. The study found that ESD was not largely mainstreamed in teacher education in the United States. Nonetheless, the study found evidence that ESD is practised in teacher education through professional development programmes. In pondering ways to transform the education systems in the United States, Nolet's (2013) study concluded that ESD offers opportunities to reorient teacher education and promotes issues such as inclusivity that have shaped teacher education in the contemporary educational landscape.

Another study by Fedulova et al. (2019) was conducted in the Russian Federation on how inclusive education can catalyse sustainable development. The study found that inclusive education was a difficult transformative agenda, including in teacher education, but it becomes integral to the societal agenda when discoursed through an ESD framework. However, the study did not connect the discourse of inclusive education and ESD to teacher education, but the argument is that teacher education could be one of several ways in which the two issues can be related. Thus, Nolet's study in the United States and Fedulova et al.'s study in the Russian Federation suggest some nexus across inclusive education, ESD and teacher education. This may represent some perspective on the situation in the Global North on the relationship between the three notions mentioned above. However, in a southern African context, explicit evidence to establish the nexus across inclusive education, ESD and teacher education is seldom available, hence this study.

2.3 Understandings of Inclusive Education, ESD and Teacher Education

As indicated in Chapter 1, the study intended to investigate how inclusive education and ESD can be augmented to support and improve teacher education towards inclusive pedagogical proficiency in the southern African context. In this respect, it is necessary to initially get an overview of how inclusive education is understood and connected to ESD in the research context. A few conceptualisations have emerged for understanding inclusive education and ESD in Southern Africa. For example, Materechera (2021) attempted to establish the nexus between inclusive education and ESD, while studies like O'Donoghue and Roncevic (2020) suggested how inclusive education could be mainstreamed via ESD practices. However, these studies did not establish a clear relationship between inclusive education, ESD and teacher education. Even so, the following emergent conceptualisations hint at an implied nexus between the three concepts: co-engaged processes of transformation, precursors of quality education, and determiners of policies and practices.

2.3.1 Co-engaged processes of transformation

Inclusive education and ESD are underpinned by the same onto-epistemological quests to redress past injustices through education (Hutchinson et al., 2023). These quests are, however, hampered by a need for a clear trajectory for implementation (Hutchinson et al., 2023). Materechera (2021) investigated teachers' experiences in implementing inclusive education in the context of sustainability education in the North West province of South Africa. The study found that the nexus between inclusive education and sustainability education rests in established partnerships that enable teachers to navigate their practices towards transformation. The findings suggest that co-engagement processes are crucial in the relationship between these two educational notions. However, O'Donoghue and Roncevic (2020) observed:

In reality, however, provision is uneven and state institutions provide a complex backdrop to the expansion of inclusive approaches to teaching and learning that are emerging alongside Education for Sustainable Development (ESD) across the current systems of educational provision in the southern African region. (p. 21)

The introductory chapter offered working definitions for inclusive education and ESD in this study. I explained inclusive education as a transformative system of mainstreaming and supporting disability inclusion in regular schools, in which all learners are placed regardless of their disabilities. I also highlighted that ESD is the practice of reshaping the education

landscape in a transformative and responsible manner to bring to discourse issues of disability inclusion in teacher education and eventually schools (see Chapter 1). A close look at these two working definitions highlights that these notions are central to transformation and change. Accordingly, one of the key understandings of inclusive education and ESD in Southern Africa is co-engaged transformation processes (O'Donoghue & Roncevic, 2020). This means that different stakeholders, such as teachers, educators and other practitioners, work together for inclusivity via sustainability processes that are aimed at transforming schooling practices. This transformation agenda has its history in undoing past injustices, such as colonialism, racism and apartheid, that institutionalised the separation of people based on factors such as race and disability. For example, O'Donoghue and Roncevic (2020) observed that “colonial modernity in South Africa was characterised by exclusionary cultural processes of erasure, appropriation, socioeconomic marginalisation and recent mainstreaming patterns of inclusion alongside ESD” (p. 21).

The co-engaged transformation processes are only meaningful if contextualised in a framework with mechanisms for influencing change (O'Donoghue & Roncevic, 2020). These processes are proposed as “an inclusive engagement of citizens intent on constituting the futures they want through deliberative processes of learning-led change” (O'Donoghue & Roncevic, 2020, p. 21). The 2020 GEM report identified teacher education as one key factor to be augmented for inclusive education to be aligned with and respond to SDG 4 on quality education. Thus, a need for mainstreaming inclusive education is that teacher education is seen as one way of improving the quality of education (Kelly et al., 2022). However, as O'Donoghue and Roncevic (2020) put it, the current systems for the mainstreaming agenda are very disjointed. This situation entails that inclusive education and ESD have been purported as co-engaged transformation processes that can potentially improve the quality of education in Southern Africa. Even so, there is no framework for bringing the synergies into collaboration for change through pedagogical proficiency. Consequently, the aspirations of SDG 4.7 are not being implemented towards different education targets, such as the Education Agenda 2030.

2.3.2 Precursors for quality education

Another key understanding of inclusive education and ESD that is emerging in the southern African context is that inclusive education is a precursor of SDG 4 on quality education (Simui, 2022). Inclusive education intends to empower learners of different abilities to contribute differently to the epistemological body of learning in the same environment (de Souza, 2020).

The understanding is that when all learners are taught together with differentiated strategies depending on their abilities, they focus mainly on cognitive development rather than perceived disabilities (Florian & Black-Hawkins, 2011). Simui (2022) designated inclusive education as a prerequisite for quality education and argued that

[T]here is urgent need to fully embrace inclusive education from the social model point of view whose emphasis is on situating the challenges of exclusion within the environment. This is a sure precursor to ensuring that no child is left behind since every child matters equally. (p. 544)

ESD empowers learners to make informed decisions regarding their existence based on factors such as environment and culture (Agbedahin, 2019). Empowering learners through ESD informs agency for learning (Rieckmann, 2018). In the ESD framework, learners are put at the centre of learning, where they can interface with funnelling factors such as sustainability principles that influence the quality of education (Lotz-Sisitka & Lupele, 2017). Since the learners are at the centre of learning, they can become responsible individuals towards their environment and peers, including those with disabilities. Thus, improving the quality of education would start with such ESD orientations (Agbedahin, 2019) and an inclusivity agenda (Simui, 2022). However, thematising inclusive education as a precursor to quality education gives a lukewarm understanding of how it relates to ESD. The understanding that inclusive education fosters quality education must explicitly delineate how it can be mainstreamed through ESD practices to utilise the agency of learning. Again, designating ESD as a praxis arena for promoting learner-centred pedagogy needs to more straightforwardly mainstream inclusivity. Thus, as inclusive education and ESD are precursors of quality education, a process linkage needs to be included between the two, hence the focus on pedagogical proficiency via teacher education in this study.

2.3.3 Determiners of policies and practices

Inclusive education and ESD have reshaped educational policy and practice globally and in Southern Africa (O'Donoghue et al., 2018; O'Donoghue & Roncevic, 2020). These educational foci have become determiners of policies and practices in schooling systems. Thus, another key understanding of inclusive education and ESD is that they are determiners of educational policies and practices. Inclusive education and ESD have made countries rethink the schooling system from inclusivity and sustainability perspectives. For example, Hummel, Engelbrecht and Werning (2014) gave an overview of the understanding of inclusive education in Malawi in light of the country's socioeconomic and cultural circumstances that affect how inclusive

education is conceptualised and implemented through educational policies and practices. The study concluded the following:

When developing future perspectives on implementing inclusive education in Malawi, special focus must be placed on multi-level discourse on inclusive education. Notions of inclusive education should be discussed and clarified by all stakeholders at the national, district, community and school levels of the education sector. Based on this multi-level discourse, achievable goals should be agreed upon at all levels. This is crucial in order to develop concrete and pragmatic implementation strategies and should lead to the avoidance of negative pressure. The concepts and goals of inclusive education must be developed in a context-sensitive manner and, therefore, can vary between different countries or even between different regions and communities of one country. (Hummel, Engelbrecht & Werning, 2014, p. 44)

The conclusion that Hummel et al. (2014) gave above points out two important things for critical consideration and further thoughtful discussion: “multi-level discourse” and “concrete and pragmatic implementation strategies”. As past studies have found, inclusive education fails at the implementation point due to the lack of a feasible, practical implementation framework, such as ESD (Materechera, 2021; Simui, 2022). However, this understanding does not embed inclusive education within the ESD framework. Instead, these are independent perceptions; hence, there is a need to examine how inclusive education contextualised in ESD could influence and shape education policy and practice through pedagogical proficiency. Put metaphorically, a ‘basket’ where inclusive education can sit is needed to achieve this quest. For example, Musara (2019) conducted a comparative international study on inclusive education as a form of social justice in teacher education in Canada, South Africa and Zimbabwe. The study’s findings indicated that inclusive education remains a suspiciously perceived concept that has yet to find a home in education practice in the Global South (South Africa and Zimbabwe).

A key onto-epistemological framing that has emerged on ESD in Southern Africa is that ESD is a learning process and should be understood and approached as such (Lotz-Sisitka & Lupele, 2017; Mickelson et al., 2019). In this learning process, stakeholders, such as educators, teachers and communities, learn *together* towards transformed practices. This understanding of ESD has implications for how sustainable development reshapes schooling systems and structures (Lotz-Sisitka et al., 2017). Generally, ESD in Southern Africa has focused on teacher professional development, community-based learning, and policy, governance and leadership. A closer look at these concerns suggests that ESD shares many facets with inclusive education and that the former could be used to mainstream the latter, but with consideration for “multi-

level discourse” and “concrete and pragmatic implementation strategies”, as Hummel et al. (2014) suggested. Therefore, this study engages ESD as a multi-level discourse in and through which inclusive education could be contextualised and mainstreamed. The study further engages teacher education as the concrete and pragmatic implementation process for mainstreaming inclusive education for pedagogical proficiency.

2.4 Strengthening Inclusive Education in Teacher Education via ESD

Many challenges have made inclusive education’s realisation difficult in the southern African region (Pather, 2019). The setbacks in inclusive education include issues concerning Global North ideologies, competencies and agency for learning, teaching models, legislation and regulation, teacher professional development, and assessments (Ainscow, 2020a; McKenzie et al., 2023). These problems impede aspirations for inclusivity and jeopardise the quest for quality education in the region.

2.4.1 Global North ideologies

Clarifying other practices has been employed in the education systems worldwide for (re)envisioning transformative practices. This means some schooling systems base their practices on previously successful experiences in different settings to (re)frame futuristic ways of schooling. Largely, this situation has had a north-south trajectory (Walton, 2018). However, the Global North ideologies must reframe the Global South practices in a co-engaging and collaborative manner. This situation speaks to inclusive education and current efforts in decolonising the education systems in Southern Africa (Muthukrishna & Engelbrecht, 2018; Walton, 2018; Engelbrecht, 2020). Muthukrishna and Engelbrecht (2018) explored inclusive education policy formulation and implementation in southern African countries, including Malawi, South Africa and Eswatini to vindicate this situation. The study found that

[d]iscourses of inclusive education, which continue to be influenced by traditional special education ideologies from the Global North and appropriated by the South, have the power to undermine or subvert the inclusive education agenda in contexts shaped by neo-colonialism. (Muthukrishna & Engelbrecht, 2018, p. 1)

Two critical points are noted above by Muthukrishna and Engelbrecht (2018). Firstly, most of the inclusive education practices in the Global South have been a replica of the Global North trajectories. Secondly, such a replica has the potential to fail the implementation agenda if approached deterministically. Some Global North studies (such as Fedulova et al., 2019; Nolet,

2013) have inferred that inclusive education can be mainstreamed in teacher education through ESD praxis. The uncritical practice would be merely accepting such assertions and replicating such nexus frameworks in Southern Africa without considering the region's context.

2.4.2 Competencies and agency for learning

Different synergies are required to strengthen inclusive education in teacher education via ESD, including acquiring competencies and agency for learning. On one hand, competencies entail the knowledge developed to advance learning. On the other hand, agency means some action that would translate into an intervention to address a problem. As O'Donoghue and Roncevic (2020) noted:

The southern African landscape of ESD and inclusive education cannot be reduced to teaching educators how best to mainstream learners with special needs. ESD has developed as an expansion in modern education to include the acquisition of the competencies and agency for learning to live in a changing world of and at risk. (p. 25)

As expressed above, more than merely training educators and teachers on inclusion is needed to help realise inclusive education. There is a need for the acquisition of competencies and agency for learning. What is clear from O'Donoghue and Roncevic's (2020) note is some connection between inclusive education, ESD and teacher education. However, the acquisition of competencies and agency for learning may need to be contextualised in a viable framework that would give practical sense to the call. Thus, this study engages with the ESD Change Project model (see Chapter 1), which has practical mechanisms that can augment the acquisition of competencies and catalyse the agency of learning.

2.4.3 Teaching models

The advocacy of inclusive education and the inclusion of ESD in education systems and structures occur simultaneously, though not synchronically (Johnson, 2016). On the part of teachers and educators, this is usually seen as an extra and unnecessary burden. As such, key stakeholders (un)willingly subvert the implementation process (Materechera, 2021). This situation speaks to a lack of commoning practices that spearhead the need for inclusivity in and through teacher education. As noted below:

Inclusive education has developed as an expanding and challenging education terrain, especially with the inclusion of ESD in the curriculum. Here it is not enough to make provision for an inclusive mainstreaming of students with special needs but there is a need to expand and

reconceptualise the educational enterprise if we are to meet the challenges of cohesion and change necessary for constituting sustainable futures on a global scale. (O'Donoghue & Roncevic, 2020, p. 26)

Thus, there is a proposed trajectory for connecting inclusive education and ESD in a southern African context, especially through the expansion and reconceptualisation of the educational agenda. However, such a trajectory could only be meaningful if educational systems move from the current trend of the Teach-Task-Assess model, which has proved to be less effective, to more competence-based and SDG frameworks that would help mainstream inclusive education in teacher education via ESD (Fischer et al., 2022; O'Donoghue et al., 2020). O'Donoghue et al. (2021) proposed that the Teach-Task-Assess model needs to be expanded to include working out solutions for educational problems by opening up participation spaces. For example, learners should not only be assessed about subject knowledge but should also be actively involved in designing assessment strategies that would translate into practical solutions to their problems.

2.4.4 Legislation and regulation

Legislation and regulation have been identified as weak areas that need to be focused on and responded to for mainstreaming inclusive education in Southern Africa. The posit is that educational practices that are not legislated and regulated are (un)willingly prone to continued exclusion. Possi and Milinga (2017) traced educational reforms and policies that have informed Tanzania's transition from special to inclusive education. One of the key findings from the study was the following:

The key policy documents reviewed indicated a lack of specific legislation and regulation addressing special and inclusive education issues. This is with respect, for example, to teacher preparation for the increasing diversity of learners, funding, curricular, assessment and evaluation procedures, and restructuring of existing infrastructures to suit inclusive best practices. (Possi & Milinga, 2017, p. 70)

In concurring with Possi and Milinga (2017), de Souza (2020) found that most African countries still need policies on inclusive education and seldom regulate the practice. Similarly, Hofman and Kilimo (2014) found that, like many other southern African countries, implementing inclusive education in primary schools takes work in Tanzania. The practice is marred by teachers' negative attitudes towards learners with disabilities, which eventually affects the quality of implementation. The study also revealed that the lack of skills for

inclusivity among teachers compromises teacher education quality. Since there is no legislation to confront and address such setbacks as negative attitudes and a lack of skills, the desire for inclusivity is a mere aspiration without concrete implementation strategies.

2.4.5 Teacher professional development

Teacher professional development has been frequently identified as a major challenge in almost all educational foci. Chataika et al. (2017) found that teachers in some primary schools in Malawi need to prepare to assist learners with special educational needs. Teachers are entrusted with effecting inclusive practices in the classroom; this situation suggests an expressed need for more in-service teacher training (de Souza, 2020). Teacher professional development is critical to achieving ESD in a southern African context. Issues of networking, curriculum and resources become more than necessary if countries are to realise quality education and promote ESD (Lotz-Sisitka, 2011). Teacher educators also require continuous professional development to assume more agency for inclusivity (DeLuca, 2012) and sustainability (Lotz-Sisitka, 2011). In teachers' professional development in ESD, much emphasis is put on situated learning (O'Donoghue & Lotz-Sisitka, 2006). Lotz-Sisitka et al. (2015) argued that teachers could develop their pedagogical proficiencies through situated learning and move towards change-oriented schooling practices.

2.4.6 Assessments

Assessments have also been highlighted as key areas of concern in both inclusive education and ESD. Assessments are the most overlooked aspect of schooling, yet they are the most important precursor in terms of agency for action. For example, a dilemma has emerged on how assessments could be carried out in the context of inclusive education (Beaton et al., 2021). Schudel et al. (2021) observed that achieving quality education requires more than implementing teacher professional development programmes. Instead, attention should also be on what programmes and strategies, including assessments, would transform the teaching practices (Schudel et al., 2021). As such, devising effective assessments within the ESD framework is critical for transforming teacher education for pedagogical proficiency via ESD practices (Shumba et al., 2021).

2.5 Strategies for Mainstreaming Inclusive Education in Teacher Education via ESD

The review of strategies for mainstreaming inclusive education in teacher education for pedagogical proficiency via ESD has revealed three main things: there is a focus on strengthening ESD in teacher education; there is a focus on mainstreaming inclusive education in teacher education; and there needs to be explicit evidence to show how inclusive education could be mainstreamed in teacher education for pedagogical proficiency in the context of ESD. In this regard, literature has, though implicitly, revealed some strategies that could help mainstream inclusive education in teacher education via ESD, including teaching methods for training teachers, learning materials, professional competencies, resource centres, policy environment and community-based learning.

2.5.1 Teaching methods for training teachers

Shumba and Kampamba (2013) examined mainstreaming ESD in Zambia's science teacher education curriculum. In their research, they found that national policies and teachers' perspectives supported the notion of ESD; however, university teaching methods for training teachers largely divorced the ESD principles. Mitchell and Sutherland (2020) recommended that teacher preparation for inclusivity use evidence-based teaching strategies and methods. The assumption is that such strategies would be replicated in inclusive schools. Chimwaza (2015) examined the challenges faced in implementing inclusive education in Malawi. The study examined one major special needs education college and a few selected primary schools in Blantyre, Malawi. The study proposes a transformation agenda in which

[t]eachers, too, have to be transformed through inclusive education so that they can know how to handle the already fragile [children] with care and help them to be able to move along without any problems with the other [children]. (Chimwaza, 2015, p. 59)

Chimwaza's (2015) study found that teacher training is crucial in realising meaningful, inclusive education in Malawi, as the teachers stand between the policy and practice of inclusivity. Thus, the studies above (Chimwaza, 2015; Mitchell & Sutherland, 2020; Shumba & Kampamba, 2013) focused on improving teaching methods for training teachers to either mainstream inclusive education or mainstream ESD in teacher education much as there is no emphasis on pedagogical proficiency.

2.5.2 Learning materials

A study by O'Donoghue and Roncevic (2020) explored ways to mainstream inclusive education in ESD in the context of the South African curriculum. The study found that learning materials, such as “cashew materials” (p. 23), meaning materials that focus on cashew nuts as an example of green economy practice, are better suited to transform the schooling structures towards inclusivity, especially in the ESD context. The study reported the below:

The adaptive development of a cashew resource for South Africa involved a comparative policy review on inclusive education and an attempt to match the content with the requirements of the curriculum. The local materials were produced for teacher education and as a resource also for including special learning needs in mainstream classrooms. The cashew materials had been developed as an inclusive and multi-perspective educational resource for secondary schools so much of the resource had to be adapted for use in earlier years. ESD-relevant topics, such as politics, fair trade, climate change, world trade, natural sciences, history and cultivation have been captured around the cashew topic. (O'Donoghue & Roncevic, 2020, p. 23)

The observation is that, from learning materials that are locally adaptive or produced, learners can develop cognitive proficiencies at the level of their abilities (Mitchell & Sutherland, 2020; O'Donoghue & Roncevic, 2020). However, for learning materials to be meaningful and available, teacher education needs to be delivered in a way that empowers teachers to be innovative in resourcing learning materials, creating a sort of cascade for inclusive pedagogical proficiency (Hodgson, 2018; Shor, 2012). In the context of inclusive education, lack of learning materials has been cited as a major obstacle, yet many resources could be reused or recycled into learning materials within the schooling environment (Dalton et al., 2012). Such initiatives can be adopted better in ESD frameworks where sustainability issues are at the fore. Thus, there is some relationship between inclusive education and ESD, but a process that would actualise such a relationship for pedagogical proficiency is not explicit, hence this study.

2.5.3 Professional competencies

Tungaraza (2014) explored the implementation of inclusive education in selected Tanzanian primary schools by interviewing headteachers and doing focus group discussions with mainstream class teachers. The study found that mainstream primary school teachers in Tanzania resist inclusive education because they need more professional competencies to implement it. The study found the following:

Some teachers believed that inclusive education would be ineffective because it would hold those without disabilities back academically. Others observed that teaching students with disabilities together with those without disabilities in the same class would cause disturbances in teaching and learning. (Tungaraza, 2014, p. 120)

A prior study by Tungaraza (2013) focused on college tutors' attitudes towards inclusive education in Tanzania. The study found that, generally, college tutors embrace the concept of inclusive education but are sceptical of the practicalities of it as they need to be adequately trained. Thus, a framework is needed to promote professional competencies for inclusivity.

2.5.4 Resource centres

Ishida et al. (2017) argued that resource centres are essential to realising inclusive education in Malawi. However, the hegemonic perception of inclusive education has been that mainstream teachers and learners with disabilities are the key players that need to be at the forefront of the inclusive education implementation processes (Muthukrishna & Engelbrecht, 2018). This situation is more of an antagonism of special education, where specialist teachers and learners with disabilities are designated key stakeholders (Florian, 2019). In inclusive education, all stakeholders, including specialist teachers and learners with disabilities, are crucial in the implementation process (de Souza, 2020). Thus, resource centres need to be taken as one of the strategies for inclusivity and not as the identification of learners with disabilities within mainstream institutions.

2.5.5 Policy environment

Perspectives of teachers and how they shape inclusivity have been topical in inclusive education research in Southern Africa. Braun (2022) tried to give attention to government and non-governmental organisations' role in inclusive education by looking at their perspectives. The study found that the policy environment (shaped by government and non-governmental players) needs to be renegotiated to promote inclusive education in Tanzania. The study highlighted a lack of non-formal initiatives that could augment the formal schooling efforts towards inclusivity. As formal learning is critical to achieving quality education and promoting ESD, the essence of community-based learning cannot be overstated. Communities are well situated to develop transformative agency for ESD, considering that teachers and learners are eventually part of the communities (Lotz-Sisitka et al., 2017). Community-based learning

resonates with the aspirations of many southern African countries to promote public education that contributes to sustainable development (Lotz-Sisitka, 2019).

2.6 Monitoring and Evaluating Inclusivity in Teacher Education in ESD Contexts

Mont (2014), reporting for the United Nations Children’s Fund (UNICEF), emphasised that “once programmes or policies are enacted to make schools more inclusive, it is important to monitor their progress” (p. 9). Furthermore, “once policies are developed and implemented, the next task is to evaluate whether they achieved their goals” (Mont, 2014, p. 9). Thus, the essence of monitoring and evaluation in any educational agenda cannot be overstated. Monitoring and evaluating inclusive education in teacher education across ESD contexts would focus on a policy-to-practice trajectory and an indicators framework.

2.6.1 Policy-to-practice trajectory

Both national and international policy frameworks are essential to advancing inclusive education (Graham et al., 2023), ESD (Feinstein et al., 2013) and teacher education (Kimathi & Rusznyak, 2018). However, if these frameworks are not implemented, they remain rhetoric. Countries often come together to endorse declarations and policy frameworks, including on ESD and teacher education, but more must be done to translate these declarations into practices successfully (Lotz-Sisitka, 2009).

Chambal and Bueno (2014) analysed the implementation of teacher education policies and practices in the context of inclusive education in Mozambique. They argued that policies are very good for educational framing because they give a context in which issues such as inclusive education could be fostered. Equally, de Souza (2020) examined how mainstream teachers in Malawian secondary schools take pedagogical actions based on the stipulations of national policies and strategies for inclusive education. The study found that the ideals of the inclusive education policy and strategy stipulations contradict the teachers’ schooling practices. This situation demonstrates that it is one thing to implement a policy and another to realise a meaningful impact.

Although international declarations and policy frameworks exist, there is a need for an agenda to reclaim agency for the countries to realise ESD (Lotz-Sisitka, 2016). Such agency could be reclaimed through practice systems (Agbedahin & Lotz-Sisitka, 2019). This situation necessitates that teacher practices must be strengthened and supported in consultation with the

teachers themselves (Lotz-Sisitka, 2006). Otherwise, if the critical stakeholders in the ESD processes are overlooked, an unrealistic situation emerges in the education system (Lotz-Sisitka, 2008). Thus, strengthening policy-to-practice parity is critical for ESD in Southern Africa (Lotz-Sisitka & Olvitt, 2009).

2.6.2 Indicators framework for monitoring and evaluation

There needs to be more research focusing on monitoring and evaluating the actual inclusive education practices. One contributing factor to this situation is the need for indicators for monitoring and evaluating inclusive education in general and in teacher education across ESD contexts in particular (UNESCO, 2020a). The SADC ESD Regional Framework (2022) observes:

Countries lack adequate indicators, monitoring, evaluation tools, and reporting mechanisms for ESD. This may be related to inadequate research and knowledge creation on ESD to inform monitoring and evaluation, especially the contribution that ESD makes to quality education and the achievement of the SDGs. (p. 11)

The situation in ESD monitoring and evaluation is also resonant with that of inclusive education. The GEM report is an annual tracking tool that surveys how education systems perform worldwide, focusing on a particular theme. For 2020, the theme was inclusive education. The report took a holistic approach to look at intersecting issues that influence inclusive education at all levels of education. The report builds on previous efforts by UNESCO to support diversity in education. One of the key points in the 2020 GEM report was that “teachers, teaching materials and learning environments often ignore the benefits of embracing diversity” (UNESCO, 2020a, p. 1).

The 2020 Profiles Enhancing Education Reviews (PEER) profiles indicated that most southern African countries lack indicators for monitoring and evaluating inclusive education. The problem with monitoring and evaluation in Southern Africa is at two levels (see Table 2.1 above). Firstly, the monitoring and evaluation of inclusive education seldom happens (Engelbrecht, 2020). In the case where it happens, the trajectory for the same is not explicitly stated. Secondly, indicators for monitoring and evaluating inclusive education still need to be developed (UNESCO, 2020a), as shown in Table 2.1 below.

Table 2.1: PEER (2020) profile findings on inclusive education in Southern Africa

Country	2020 PEER Profiles findings on inclusive education
Angola	“Angola has no annual monitoring report and there is no evidence of indicators that monitor inclusive education.”
Botswana	“According to the review, a clear legal mandate to collect information from all education institutions and bodies for education statistical purposes was lacking.”
Eswatini	“Statistics on learners with special needs is integrated with other education statistics, but the unclear definition of special needs affects the quality of statistics captured.”
Lesotho	“Lesotho has no annual monitoring report and there is no evidence of indicators that monitor inclusive education.”
Malawi	“There are no indicators to monitor and evaluate implementation performance for learners with special education needs.”
Mozambique	“No evidence of indicators to measure inclusive education in the country has been found.”
Namibia	“While the eighth strategy of the 2013 policy was to ‘develop a mechanism for monitoring and evaluating’, the 2018 assessment found that reliable statistics were still lacking.”
South Africa	“The Education Statistics Report provide[s] a broader overview of the education system, including the number of learners in special needs education sectors, by primary disability and province.”
Tanzania	“The National Strategy for Inclusive Education 2018–2021 acknowledges that data on vulnerable children and youth and on learners with disabilities is limited.”
Zambia	“Zambia does not have a national monitoring report and the collection of data on students with disabilities has many flaws.”
Zimbabwe	“The 2016–20 education sector strategic plan identifies one indicator linked to inclusive education, which is the percentage of children with disability enrolled in early childhood education.”

Source: UNESCO (2020) PEER profiles⁵

As seen in Table 2.1 above, the monitoring and evaluation of inclusive education have focused on what government ministries do to monitor and evaluate inclusive education. As such, it is

⁵ <https://education-profiles.org>

not easy to trace efforts towards inclusivity. This situation is not unique to the agenda of inclusive education. Instead, ESD and teacher education praxis are also held back by a lack of indicators for monitoring and evaluation (SADC, 2022). Therefore, this study has monitoring and evaluation of inclusive education in teacher education across ESD contexts as one of its foci. The focus is on something other than what government ministries are doing in the monitoring and evaluation processes. Rather, the focus is on how inclusive education practices can be monitored and evaluated, especially in teacher education practices via ESD practices. Thus, the study solicits ideas from teacher educators to proffer indicators for monitoring and evaluating inclusive education in teacher education via ESD (see Chapter 8, Section 8.4). In doing this, the study responds to the 2020 GEM report and PEER profiles on the unavailability of indicators for the monitoring and evaluation of inclusive education in the region.

2.7 Conclusion

This chapter reviewed literature on the histories, policies and practices of inclusive education in teacher education in the context of ESD. The chapter revealed co-engaged processes of transformation, precursors of quality education, and determiners of policies and practices as understandings of inclusive education and ESD in a southern African context. It also revealed Global North ideologies, competencies and agency for learning, teaching models, legislation and regulation, teacher professional development, and assessment as areas that need strengthening for teacher educators to mainstream inclusive education in teacher education for pedagogical proficiency via ESD. Furthermore, the review focused on teaching methods for training teachers, learning materials, professional competencies, resource centres, and policy environments as strategies that teacher educators may develop to mainstream inclusive education in teacher education via ESD praxis. Lastly, the chapter concentrated on the policy-to-practice trajectory and the lack of indicators for monitoring and evaluating inclusivity in teacher education in the ESD context. The review in this chapter suggests that inclusivity and ESD are transformative praxis arenas for human development and learning. However, there is a lack of integrative theoretical tools to address disjunctions in the potential for pedagogical proficiency from a nexus between inclusive education, ESD and teacher education. The next chapter discusses an integrative theoretical framework for the study.

CHAPTER 3

INTEGRATIVE THEORETICAL TOOLS FOR PEDAGOGICAL PROFICIENCY RESEARCH

3.1 Introduction

This third chapter focuses on the theoretical framework for investigating the mainstreaming of inclusive education in teacher education practice for pedagogical proficiency through ESD Change Projects. It explains the theoretical decisions and choices relevant to the study. The chapter details Urie Bronfenbrenner's bioecological system theory of human development (2005) and Lev Vygotsky's sociocultural theory of learning (1978) and traces their developing threads. The actual employment of the theoretical arguments in the study is discussed in this chapter. Importantly, this chapter argues that human development and learning processes frame and inform inclusive education. As such, the chapter justifies that employing the bioecological and sociocultural theories is necessary to investigate teacher educators' inclusivity practices in teacher education programmes via the ESD praxis.

3.2 Theories of Human Development and Learning

A theoretical framework is a structure that explains the theoretical tenets that underpin a research problem and its context (Anfara & Mertz, 2014; Collins & Stockton, 2018; Kivunja, 2018; Lederman & Lederman, 2015). Usually, "theories provide a framework for the study of human development that furthers scientific vision and stimulates the application of science for public policy and social programs. Most importantly, theories help organise a large body of information and provide ways of examining facts" (Wong et al., 2020, p. 24). This study's theoretical framework draws on theories of human development and learning. Scholars have observed that many human development and learning theories focus on interactions in and across systems (see Lerner, 2018; Newman & Newman, 2022; Wong et al., 2020).

As indicated in Chapter 1 (Section 1.8), this study is informed by two theories of human development and learning: Urie Bronfenbrenner's (2005) bioecological system theory of human development and Lev Vygotsky's (1978) sociocultural theory of learning. The

bioecological system theoretical work builds on my master's research⁶ on inclusivity, in which I worked with the theoretical framework of Bronfenbrenner's (2005) bioecological systems in Malawi, exploring the policy and practice of regular secondary school teachers in assisting learners with physical disabilities. My discussion of this theory in the previous study was narrow, and its applicability was limited. I have developed this theory into a comparatively applicable theoretical framework for this doctoral study, together with the Vygotskian theory.

3.2.1 Bioecological system theory of human development

A Soviet-born American psychologist, Urie Bronfenbrenner (1917–2005), propounded a basis for the ecological system theory of human development. Bronfenbrenner's perspectives on the ecological system theory are wide and have developed over time. The later version of the ecological system theory based on Bronfenbrenner's cumulative work assembled in *Making human beings human: Bioecological perspectives on human development* (2005) frames this study. In a foreword to Bronfenbrenner's bioecological theory (2005), Richard Lerner observed that Bronfenbrenner's model is ideal for “conceptualising the integrated developmental system and for designing research to study [the] course of human development” (Lerner in Bronfenbrenner, 2005, p. xv). Bronfenbrenner's (2005) bioecological system theory is to some extent influenced by Lev Vygotsky's sociocultural theory, especially its emphasis on a developing individual and interactions with and in sociocultural environments. Over time, Bronfenbrenner refined his theory through critique and revisions, developing it from an ecological to a socioecological and then a bioecological system (Sadownik, 2023).

This study uses a theoretical and research design model Bronfenbrenner termed Process-Person-Context-Time (or PPCT). The PPCT model comprises four elements in the ecology of human development. These elements are not exclusive; instead, they are closely intertwined and frame human development. In the context of this study, human development is primarily framed in the context of pedagogy and learning. In the foreword to Bronfenbrenner's work, Lerner indicated that “Bronfenbrenner believe[d] that just as all the components of the model must be included in any adequate conceptual specification of the dynamic, human development system, so too must research investigate the role of all of them to provide data adequate for understanding human development” (Lerner in Bronfenbrenner, 2005, p. xv). Therefore, in this

⁶ <http://hdl.handle.net/10962/171254>

study, the PPCT model provides co-engagement and an analytical framework for supporting teacher educators in mainstreaming inclusive education in teacher education for pedagogical proficiency via ESD practices in Malawi, Tanzania and Eswatini. Figure 3.1 below shows the PPCT model.

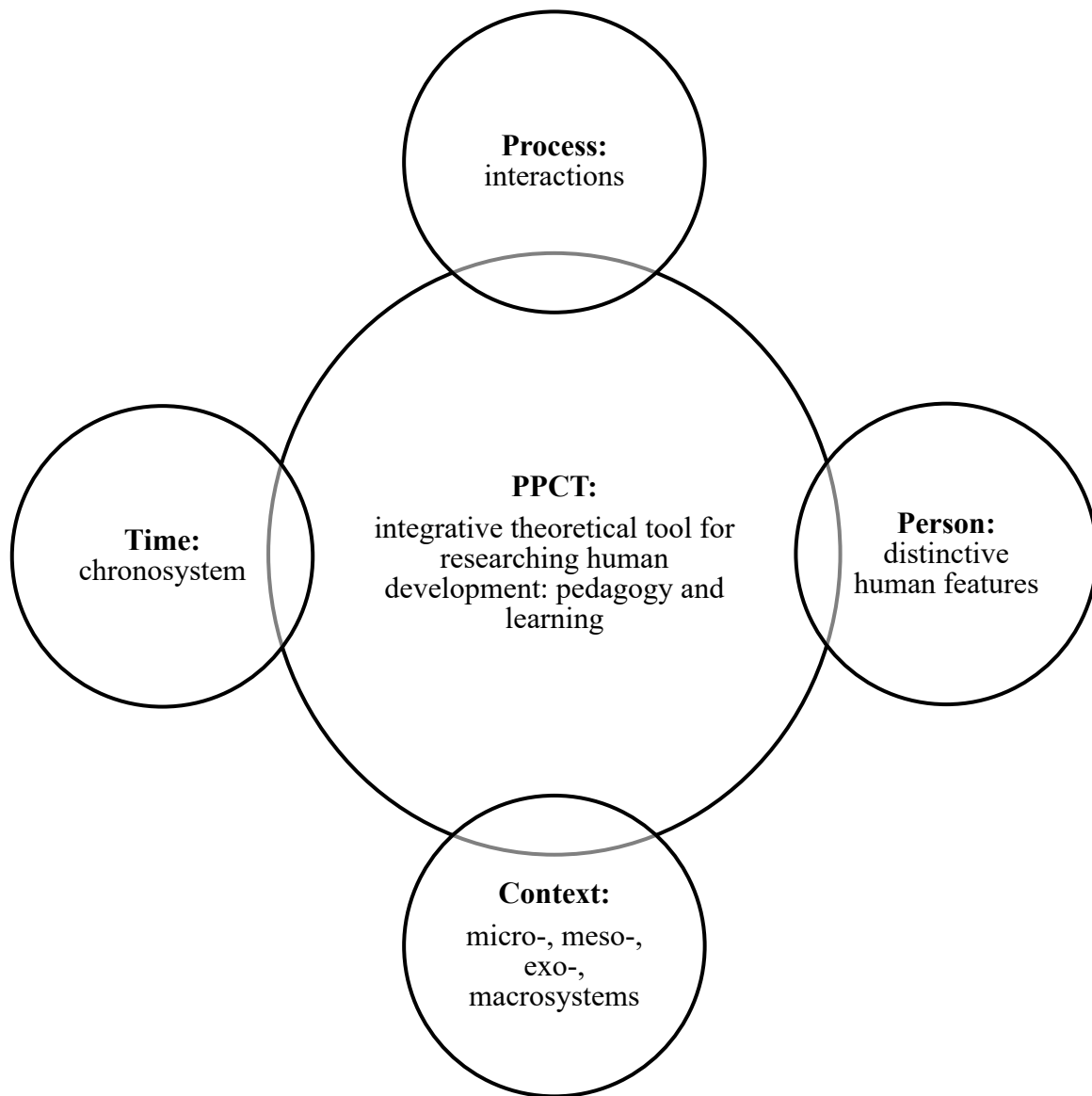


Figure 3.1: Bronfenbrenner's PPCT model

Figure 3.2 below shows an applied version of Bronfenbrenner's PPCT model, using the concrete concepts related to this study.

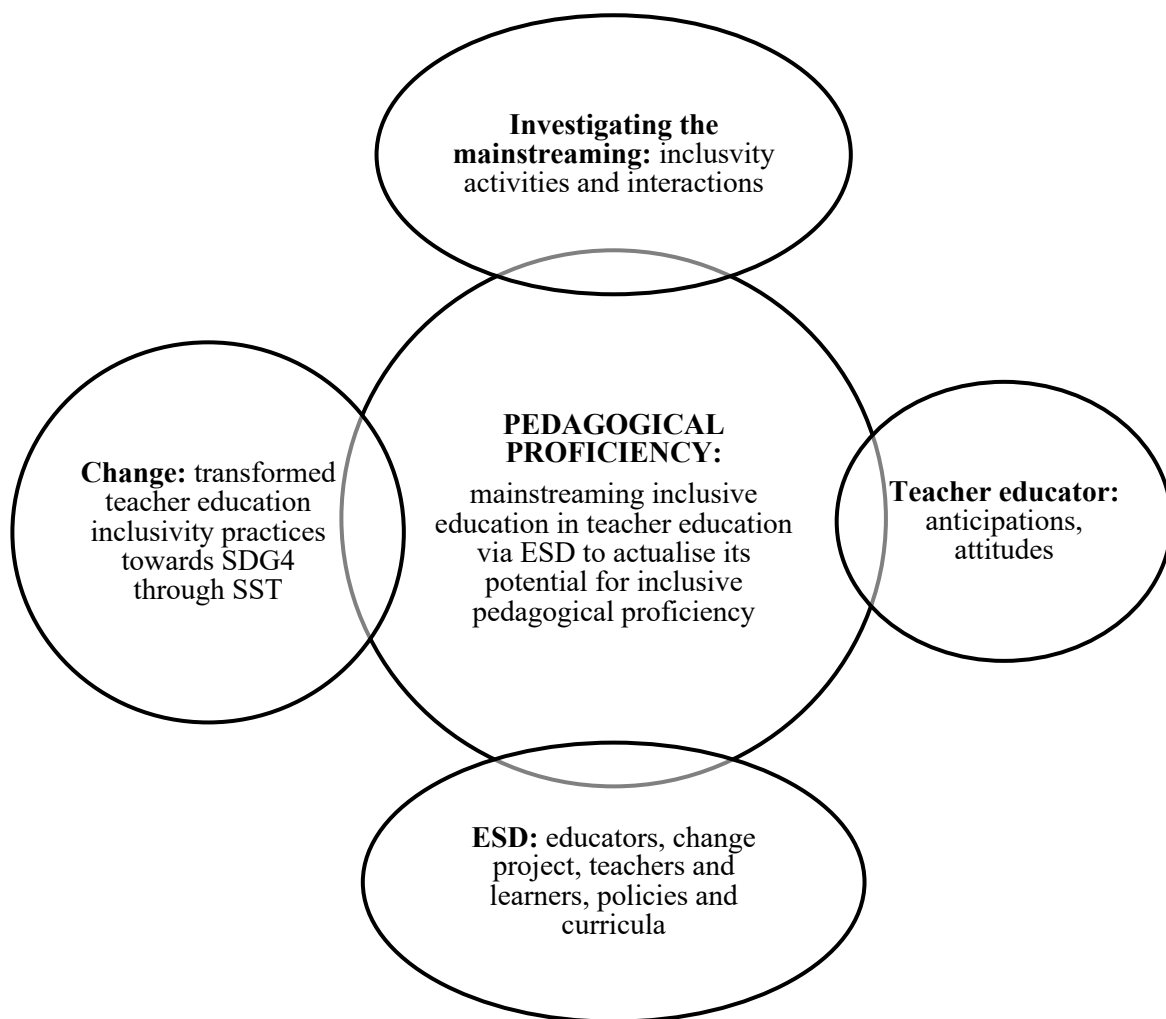


Figure 3.2: Exemplar PPCT model for the study

The Process component of the PPCT model refers to a relationship between and across an individual and their sociocultural context (Bronfenbrenner, 2005). Proximal processes are crucial in the Process component. As this study focused on investigating and supporting teacher educators to mainstream inclusive education in teacher education practice for pedagogical proficiency in the context of ESD, the mainstreaming aspect makes up the primary focus of the Process component in this study. Through the mainstreaming process, i.e. teacher education praxis, different activities and interactions shape and inform teacher educators' inclusivity praxis via ESD Change Project activities in the Sustainability Starts with Teachers (SST) programme. Thus, the Process element of the PPCT model is employed to analyse the 'proximal processes' of teacher education concerning inclusive education and ESD and to look at any relationship between the three concepts of inclusive education, ESD and teacher education and how it emerges in a southern African context.

Following on from the Process component in the PPCT model is the Person component. This component can be regarded as the individual and human features that shape people's practices in a particular environment (Bronfenbrenner, 2005). Human characteristics determine an individual's development process (Denton, 2011). Bronfenbrenner (2005) explained Person component is made up of distinctive features such as the anticipations and attitudes of an individual. In this study, the Person component is made up of the teacher educators and their practices, experiences and personal beliefs regarding issues of inclusive education and ESD. However, the Person component may not entail an individual only. It may also be a group or a community of practice working towards a common good, as is often the case in ESD practices. Nevertheless, the group or community of practice is still designated as the Person component.

The Time component in the PPCT model refers to any observable changes due to bioecological interaction in an individual's environment over time (Bronfenbrenner, 2005). In the original conceptualisation of the ecological theory, Bronfenbrenner ignored the Time component in the course of an individual's growth. Bronfenbrenner later construed the Chronosystem (time dimensions) as a necessary determinant element of human development (Shelton, 2018). I expand on this system and the four bioecological systems under the Context component below. Still, the PPCT model's Chronosystem falls into the Time component. The Time component becomes essential in this study because it speaks to the monitoring and evaluation foci of the study. The progress and achievements of the Process component as well as the pre-training, post-training learning and change process (implementation of the ESD change projects) by the Person component in the Context component can only be appreciated through the Time component.

The Context component of the PPCT model entails the interrelated systems that determine and influence an individual's (Person component) development (Process component) (Bronfenbrenner, 2005). This PPCT model component comprises closely intertwined, nested bioecological systems such as the microsystem, mesosystem, exosystem and macrosystem (Wong et al., 2020). Based on Urie Bronfenbrenner's (2005) original conceptualisation of the bioecological systems theory of human development, I expand on these nested systems below. Although I discuss the systems separately, in principle, they fall within the Context component (micro, meso, exo, macro) and Time component (chrono) and interconnect with other PPCT model components. Thus, in the foci of this study, ESD becomes the Context component in which inclusivity practices could be investigated and mainstreamed in teacher education praxis

such as the SST programme. The five bioecological systems give practical meaning to an individual's development, as shown in Figure 3.3 below and explained thereafter.

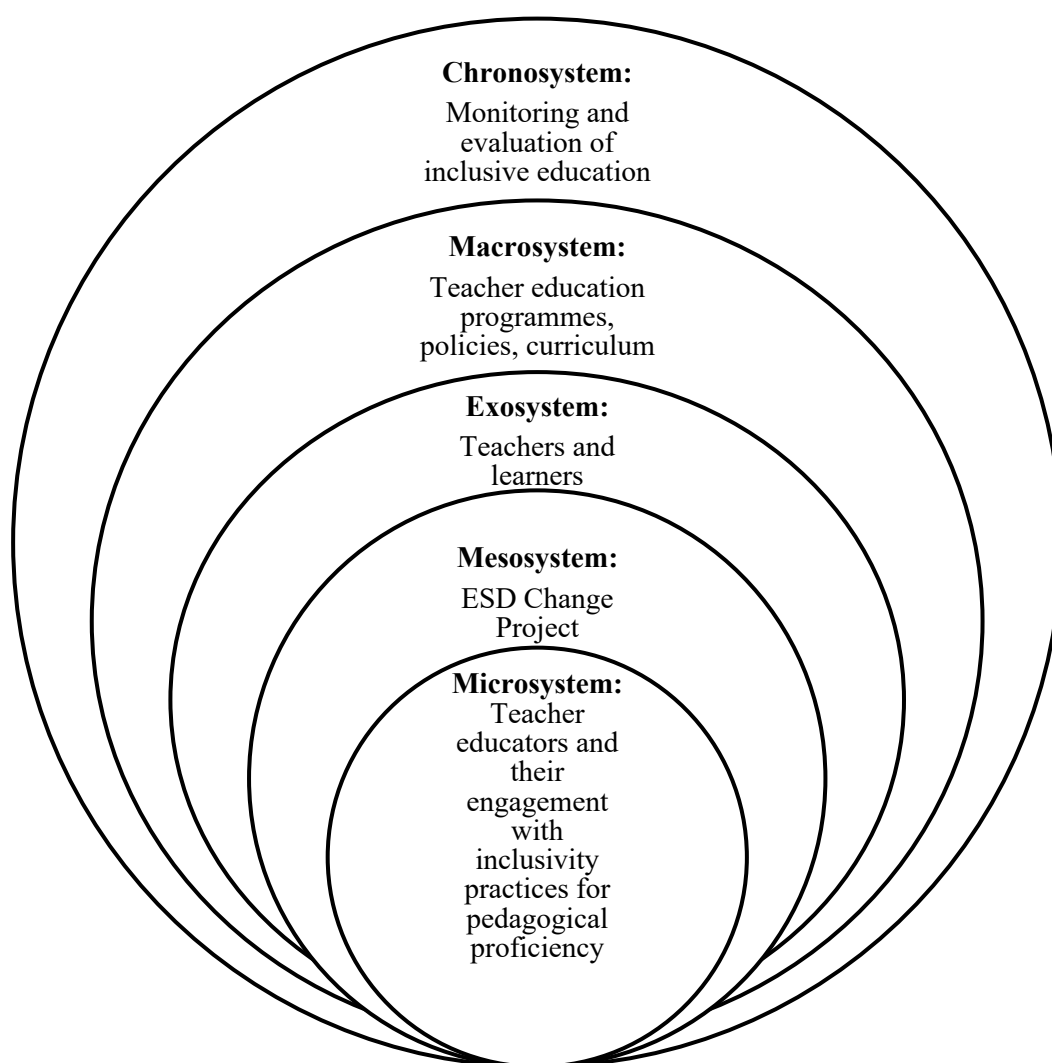


Figure 3.3. Bronfenbrenner's five bioecological systems

Source: Adapted from McLinden et al. (2018b, p. 167)

According to Bronfenbrenner (2005), the microsystem entails a “pattern of activities, roles, and interpersonal relations experienced by the developing person in a given face-to-face setting with particular physical and material features and containing other persons with distinctive characteristics of temperament, personality, and systems of belief” (p. 148). The original tenet of the microsystem (see Bronfenbrenner's ecological and socioecological theories) put a child (a learner) at the core of this system (de Souza, 2020). However, according to Bronfenbrenner's revision of the theory in 2005, this does not mean that the child would be the only unit of analysis in this system, as they exist in interaction with other factors such as teachers, parents

and peers (Rosa & Tudge, 2013; Shelton, 2018; Swartz, 2015). In essence, theorising and centralising other factors apart from the developing child is possible. Thus, for this study, teacher educators and their inclusivity practices become a unit of analysis while acknowledging the existence and relevance of other factors, including teachers, learners and peers.

The mesosystem can be defined as “a system of microsystems” (Bronfenbrenner, 2005, p. 160). This definition entails that a mesosystem involves an interaction of two or more factors within a microsystem. For example, an interaction between a developing child and their parents forms a mesosystem. For the theoretical context of this study, such interactions are between teacher educators collaborating with other teacher educators on a Change Project, and a teacher educator interacting with pre-service teachers in teacher education programmes via ESD practices. Central to the mesosystem is the influence that units of the microsystem have on each other (Onwuegbuzie et al., 2013). This study assumes that teacher educators have the potential to influence pedagogical proficiency among pre-service teachers, which would eventually influence inclusive and sustainable education practices in schools. Theoretically, as scholars (see Nketsia et al., 2020; Pit-ten Cate et al., 2018; Robinson; 2017) have argued, this assumption manifests in the mesosystem. Thus, the Change Project activities that teacher educators engage in become a mesosystem for investigating the mainstreaming of inclusive education in their practices through ESD programmes such as the SST.

The exosystem is a system in which interactions involve units that are not the core of analysis in the microsystem (Bronfenbrenner, 2005). Put differently, an exosystem involves those factors that, in the case of the original tenets of Bronfenbrenner, the developing child is not involved, but the effects of the interactions funnel down to the child in the microsystem through the mesosystem (Hayes et al., 2017; McLinden et al., 2018a; Stofile et al., 2013). In this study, the crucial interaction within an exosystem is between teachers (in schools) and learners (especially those with disabilities). The study assumes that whatever the teacher educators do with their pre-service teachers funnels down to the learners in schools. As such, this study focuses on investigating the mainstreaming of inclusion issues in teacher education for pedagogical proficiency through ESD practices. The expectation is that teachers will eventually apply inclusive practices once they are in mainstream schools.

The macrosystem has “particular reference to the developmentally instigative belief systems, resources, hazards, lifestyles, opportunity structures, life course options, and patterns of social interchange that are embedded in each of the [micro-, meso- and exo-] systems”

(Bronfenbrenner, 2005, p. 150). Bronfenbrenner designated a macrosystem as composed of metaphysical and sociocultural factors influencing a developing child's physical, social and cultural environment (Bamber, 2019). In this study, teacher education institutions, projects, programmes, policies and curricula fall into the macrosystem. This situation is so because, as scholars (like Hopkins & McKeown, 2014; Laurie et al., 2016) have observed, these are the metaphysical and sociocultural factors that shape teacher educators' ESD practices.

The Chronosystem is the “patterning of environmental events and transitions over the life course” (Bronfenbrenner, 2005, p. 43). The life course entails that the Chronosystem is much like a tracking system of what happens in the life of a developing child, at least according to what Bronfenbrenner initially propounded and as used in other studies (see Hayes et al., 2017; Tudge & Rosa, 2019; Tudge et al., 2009). However, in this study, ESD objectives, SDG 4 (Target 4.7) indicators and SST course goals fall within this system. All these units are interested in monitoring and evaluating what happens after a time in terms of education complementing sustainable development. Specifically, this study focuses on what happens in mainstreaming inclusivity in teacher education via ESD in three countries: Malawi, Tanzania and Eswatini.

The human development processes resonate with intentions of inclusive education which emphasises a holistic approach to human development and whole institution approaches to learning. Many research designs in inclusive education (see Chimwaza, 2015; Swartz, 2015) have adopted human development theoretical perspectives, offering analytical insights into the discourse of inclusivity in human development related to learning processes. Thus, this study offers a research design in inclusive education from a human development perspective informed by learning processes via ESD practices, with Bronfenbrenner's bioecological systems theory offering a way of developing such a framework.

This study uses the PPCT model to develop an understanding of cases from the three SST countries, Malawi, Tanzania and Eswatini, for three reasons. Firstly, the theory concerns interactions (Process and Person components) in physical, social and cultural environments that profoundly influence human development (Soni et al., 2020). Secondly, the theory offers a broad frame of interrelated and nested systems (Context component) (Crawford et al., 2020). Those systems have the potential to “provide data adequate for understanding human development” (Lerner in Bronfenbrenner, 2005, p. xv). Thirdly, the theory has a monitoring

and evaluation tool (Time component – the Chronosystem) that could track the issues of inclusive education (McLinden et al., 2018b) in teacher education practices via ESD contexts.

This study applies Bronfenbrenner’s theoretical framework at two levels. At the first level, the study uses the PPCT model to investigate broader situations of inclusive education in teacher education practices via ESD. This use entails that the PPCT model resonates with country cases from the three countries. Then, the study employs the nested bioecological systems to look into individual teacher educators or a group ESD Change Project. In doing this, the study also takes cognisance of critiques of Bronfenbrenner’s theory, pointing to its inadequacy in explaining how negative encounters may foster positive and resilient human development (Wong et al., 2020). As such, the study looks at how shortfalls (negative) in teacher educators’ practices afford opportunities for further learning (positive) through working with Vygotskian sociocultural (expansive) learning theory, and through this, the study seeks to address this critique in Bronfenbrenner’s bioecological systems theoretical framework. By choice, I do not discuss about expansive learning in this chapter because I have adapted Engeström’s tenets on this into a methodological torch rather than a theoretical guide (see Chapter 4). Expansive learning as described by Engeström focusses on the expansion on human activity through learning using tools of double stimulation. In Engstrom’s theory such learning leads to transformative agency. Engeström’s work draws on Vygotsky’s theory of sociocultural mediation discussed further below.

3.2.2 Sociocultural theory of learning

Lev Semyonovich Vygotsky (1896–1934) was a Soviet developmental and educational psychologist whose work shaped sociocultural theories of learning. The translated work, *Mind in society: Development of higher psychological processes* (1978), offers a consolidated view of Vygotsky’s theory of mind. Before Vygotsky’s work, it was generally accepted that development is independent of learning, is usually a condition for learning, or equates to learning (van der Veer, 2020; Vygotsky, 1978). In a departure from these traditional views on learning and development, Vygotsky developed a sociocultural theory of learning, which is underpinned by a dialectical relationship between learning (from culture and environments via language) and development and shows that learning *leads* to development through internalisation processes (Vygotsky, 1978). The processes of internalisation recognise that learning emerges from interactions in an individual’s sociocultural environment. Such interactions could entail Change Project activities among teacher educators or with teachers.

For example, a Change Project is a community of practice in which individuals with different abilities, attitudes and anticipations resonate to the object. In the case of the SST programme, teacher educators were encouraged to learn *with* others in developing their capabilities for ESD in teacher education practice. The activities involved in the learning processes translate into interactions that open up new learning spaces for the individuals involved. The prominent concepts in Vygotsky’s theory are shown in Figure 3.4 below.

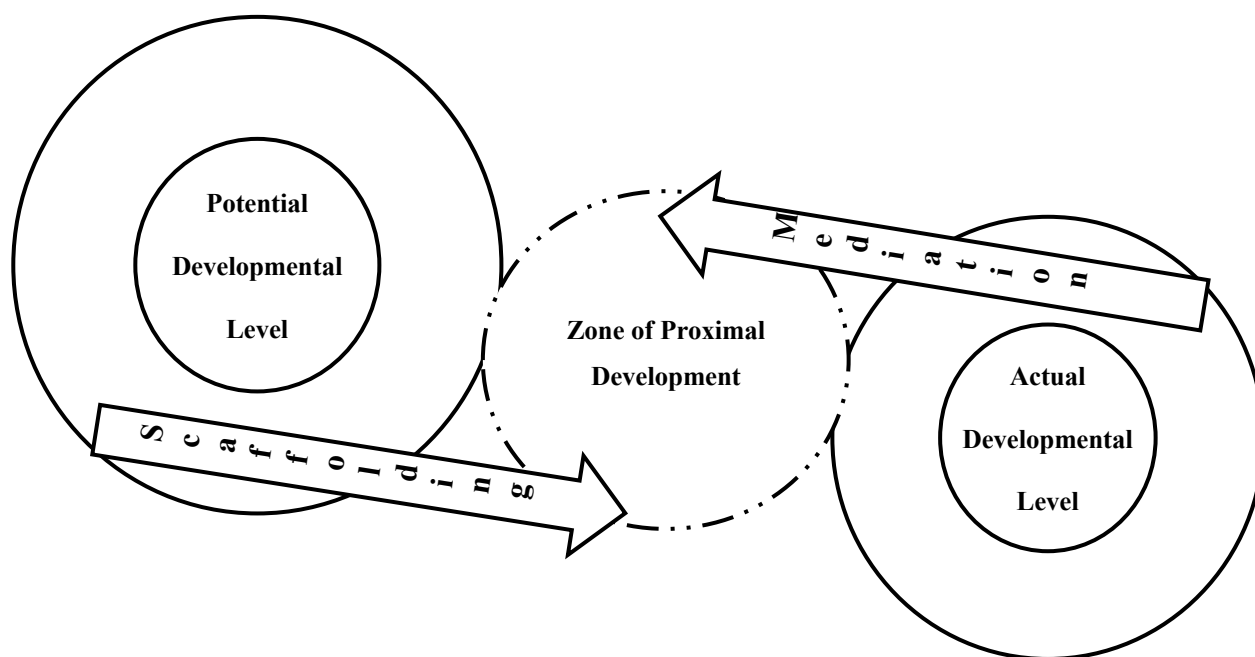


Figure 3.4: Vygotskian sociocultural theory of learning

Vygotsky (1978) defined the actual developmental level (ADL) as “the level of development of a child’s mental functions that has been established as a result of certain already *completed* developmental cycles” (p. 86). The ADL represents developmental (and learning) capabilities that a child has already achieved. Vygotsky calls these capabilities “fruits of development” (Vygotsky, 1978, p. 86). For example, if a child can count numbers from 1 to 10, it implies that such a child has achieved certain intellectual abilities to count within that range. In inclusive practice, the ADL has been the onto-epistemic structure of a special school where learners are placed according to their achieved abilities.

Thus, ADL has been the basis for special schools and the discriminatory educational practices that come with them. This supposition forgets that “any learning a child encounters in school always has a previous history” (Vygotsky, 1978, p. 84). As Zaretskii (2016) critiqued, education policies that support special schools tend to base their arguments on this level of

development, supposing that a child with disabilities cannot learn anything beyond the concrete. Zaretskii's critique originates from Vygotsky's (1978) observation:

Studies have established that mentally retarded children are not very capable of abstract thinking. From this, the pedagogy of the special school drew the seemingly correct conclusion that all teaching of such children should be based on the use of concrete, look-and-do methods. And yet a considerable amount of experience with this method resulted in profound disillusionment. It turned out that a teaching system based solely on concreteness – one that eliminated from teaching everything associated with abstract thinking – not only failed to help retarded children overcome their innate handicaps but also reinforced their handicaps by accustoming children exclusively to concrete thinking and thus suppressing the rudiments of any abstract thought that such children still have. (p. 89)

This study does not include research with children nor work in special schools. The study supports teacher educators in teacher training institutions. Nonetheless, the ADL concept from Vygotsky's sociocultural theory of learning becomes a necessary dialectical theoretical tool to look into teacher educators' practices. The rationale is that teacher educators work with teachers to mediate and develop their inclusive pedagogy proficiency, which informs schooling practices where special school philosophy is being challenged and destabilised into inclusivity (Farrell, 2010). The study assumes that teacher educators have certain ADL capabilities from their practices before and through the SST programme. Actually, "concreteness is now seen as a necessary and unavoidable only as a stepping stone for developing abstract thinking – a means, not as an end in itself" (Vygotsky, 1978, p. 89). For example, these teacher educators have been confronting issues concerning ESD in teacher education curricula. Thus, this study takes this situation as an exemplar of ADL for teacher educators. However, the study also assumes that teacher educators can develop more learning concerning their practices. For instance, teacher educators may not have retrospective experience with inclusivity but could potentially learn through different activities, hence the zone of proximal development (ZPD) to mediate and expand their learning spaces.

According to Vygotsky (1978), the ZPD is "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 87). In other words, the ZPD represents the potential developmental (and learning) capabilities that a child or person is yet to achieve (Wong et al., 2020). As Zaretskii (2016) inferred, the education agenda that places learners without disabilities in mainstream

education assumes that these children are more capable of abstraction than their peers in special schools. This education agenda forgets that

[a]lthough learning is directly related to the course of child development, the two are never accomplished in equal measure or in parallel. Development in children never follows school learning the way a shadow follows the object that casts it. In actuality, there are highly complex dynamic relations between developmental and learning processes that cannot be encompassed by an unchanging hypothetical formulation. (Vygotsky, 1978, p. 91)

The mainstream education assumption contradicts the principle that “learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and cooperation with his peers” (Vygotsky, 1978, p. 90). Sadly, teacher education has been philosophised with the presumption that mainstream education is for learners without disabilities who are supposedly more capable of abstract thinking beyond the ADL (Done et al., 2013). Thus, as some learners with disabilities are now in regular schools, the exclusion is inevitable because, as studies (such as Kurth & Foley, 2014; Li & Ruppap, 2021) found, teacher education has been slow to orient itself towards inclusivity. Figure 3.5 below illustrates how the sociocultural theory manifests in and applies to this study as a co-engagement and analytical tool.

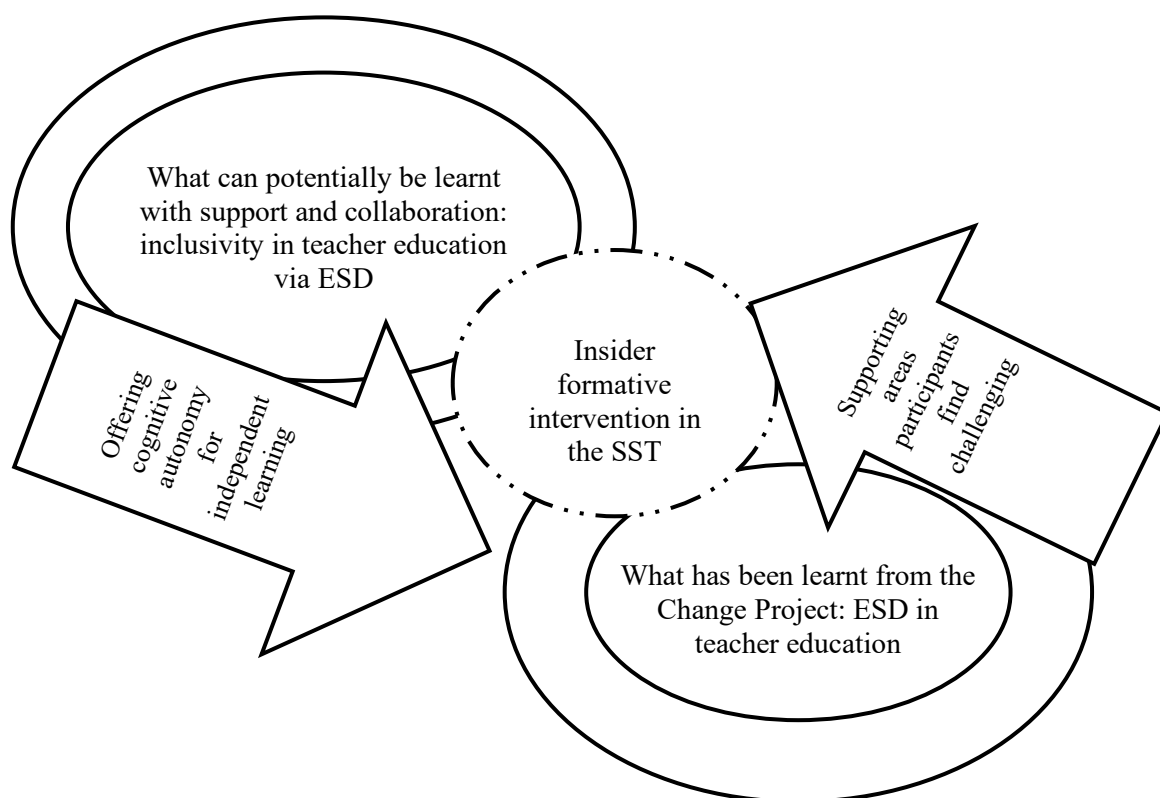


Figure 3.5: Exemplar Vygotskian sociocultural framework for the study

As shown in Figure 3.5 above, this study was constructed as a formative interventionist study focusing on SST Change Projects (see Chapter 4) to support teacher educators in expanding their knowledge spaces and developing new horizons of knowing and doing. Therefore, this study applies the notion of ZPD to the context of professional development for teacher educators. The study regards what the teacher educators have achieved through their Change Projects as their learning in ZPD. However, there is always potential for learning, and I associate these with what Vygotsky (1978) called “flowers of development” (p. 86).

In a Vygotskian sense, the SST programme was the first level of mediation for the participants’ teacher education practices. As a researcher, I *mediated* (standing between) the participants’ ADL into ZPD, at second level of mediation, using research activities via workshops and other data generation methods and tools, and then *scaffolded* (giving cognitive autonomy) their learning when they opened new spaces for learning to improve their Change Projects further. However, I was also naturally designated to learn *with* and *from* the teacher educators in this supporting process. Furthermore, the teacher educators were not bound to learn within my knowledge horizons. Instead, they were naturally positioned to develop more ‘higher-order’ practices because “what is in the zone of proximal development today will be the actual developmental level – that is, what [they] can do with assistance today [they] will be able to do by [themselves] tomorrow” (Vygotsky, 1978, p. 78).

3.3 Theoretical Lacuna

The study engages with the bioecological system theory fully aware that Bronfenbrenner’s (2005) theory is criticised for its inadequacy in explaining how negative human development encounters may foster positive and resilient human learning (Christensen, 2010). Thus, Bronfenbrenner’s framework has a theoretical lacuna. In developing Bronfenbrenner’s bioecological systems framework further, Vélez-Agosto et al. (2017) wrote:

In our revision to the bioecological model, our main critique comes from an ontological dimension and from a practical dimension. Human development takes place within a cultural system. Culture constitutes the context and reality of the developing person and that makes culture a paradigm. From a practical dimension, individuals participate in cultural practices shaped by context specificity and interact with communities and social institutions that are both proximal and distal. Communities and social institutions are also interpretative systems that have the power to change and be changed in those interactions. Culture is embedded in all institutions that have the power to homogenize the daily routines within that context through political policies, laws, and regulations. Individuals interact in different contexts and internalize certain

cultural values and practices, making each experience unique from a particular time in life development. Thus, the individual adds diversity to the setting it interacts in. (p. 906).

To address this criticism, the study draws on Vygotsky's theory, especially his concept of the ZPD in the sociocultural context, to examine how shortfalls (negative) in teacher educators' inclusive education and teacher education practices via ESD afford opportunities for new learning (positive). The bioecological theoretical model provides a biopsychosocial terrain for understanding teacher educators' practices but lacks the pedagogical tenets that could expand and transform their practices. Vygotsky (1978) argued that theoretical frameworks that are non-dialectical, that analyse objects instead of processes, that describe instead of explain, and that ignore historicised changes are less helpful in studying human development and its implications on learning. I acknowledge that both Bronfenbrenner's and Vygotsky's frameworks are dialectical but the former is more situated to analyse human development trajectories while the latter is more proficient in articulating learning implications, hence their synergy in this study.

The theoretical framework for this study adopts a dialectical approach and focuses on analysing processes of learning and development of teacher educators with reference to their inclusive pedagogical proficiency. As indicated in Chapter 1, the unit of analysis in this study is teacher educators' engagement with inclusivity in SST ESD Change Projects. The theoretical model for this study aims to explain rather than describe. It aims to explain education systems that shape and inform inclusivity in teacher education.

Furthermore, the theoretical framework takes an interest in past events of the teacher educators' practices. In resonance with the intentions of ESD, formative intervention in the Change Projects does not bring new activities to implementation. Instead, the formative intervention augments and expands what teacher educators already do, and this can be historicised from their practices. Vygotsky (1978) argued that many traditional theoretical methods ignore "the problem of fossilised behaviour" (p. 63) because they do not historicise past events in the context of present changes. Thus, the theoretical framework for this study helps to retrospectively look at teacher educators' past practices and prospectively support transformed practices. Figure 3.6 below shows the consolidated theoretical framework for the study and the co-engaging questions.

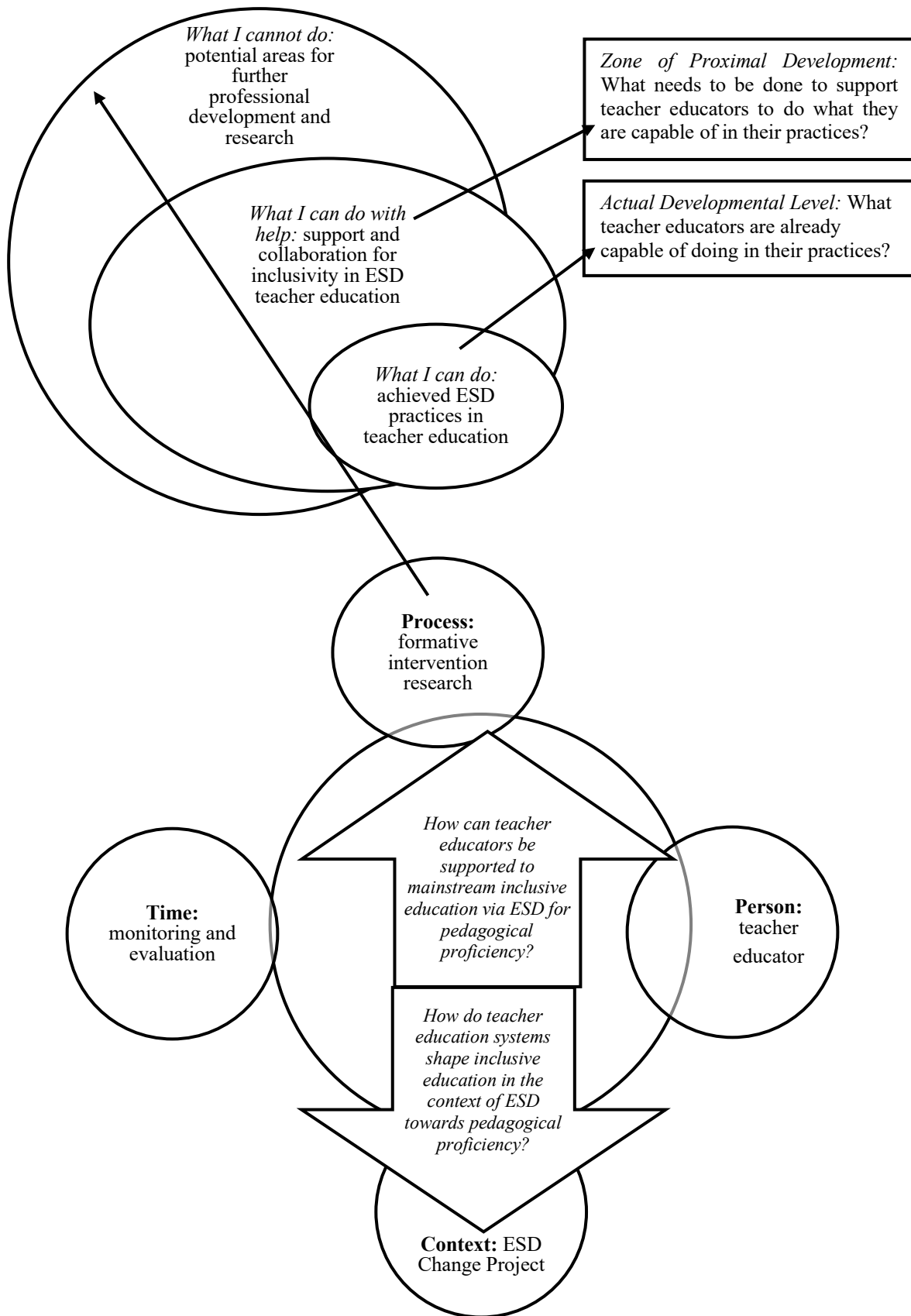


Figure 3.6: Theoretical framework and co-engaging questions

3.4 Conclusion

This chapter presented the theoretical framework for the study, and three areas were articulated. Firstly, the study employs Bronfenbrenner's (2005) bioecological systems theory of human development to examine teacher educators' practices through their ESD Change Project activities. Secondly, Bronfenbrenner's theory is complemented by Vygotsky's (1978) sociocultural theory of learning to develop a theoretical framework that enables co-engagement with the teacher educators in the ZPD. Thirdly, the theoretical framework put together for the study is dialectically sufficient because its foremost aim is to analyse a process of change rather than an object of change, and it aims at explanation rather than description only to historicise teacher educators' practices towards transformed teacher education via ESD praxis with a focus on inclusive pedagogical proficiency. I employed critical realism as an underlabourer and expansive learning as a methodological torch. I acknowledge that the two can possibly be applied as theoretical frameworks, especially the expansive learning in the context of Cultural Historical Activity Theory (CHAT) research. Still, the way I have used critical realism and expansive learning in this study speaks more to methodological framework guidance. Therefore, I incorporate the two in the next chapter which presents the research design and methodology for the study.

CHAPTER 4

FORMATIVE INTERVENTIONIST RESEARCH DESIGN AND METHODOLOGY

4.1 Introduction

This fourth chapter presents the research design and methodology, explaining the case study design with an insider formative interventionist approach. Qualitative data generation methods are discussed in this chapter. The chapter also explains the research process conducted through Engeström's expansive learning phases. The chapter further explains the rationale behind the critical realist philosophical underlabouring used to challenge the dichotomic binary opposition that institutionalised exclusion in the education system by othering learners with disabilities while philosophising teacher education. Issues of validity, trustworthiness and ethics are also addressed in this chapter.

4.2 Insider Formative Interventionist Design in the SST Programme

An insider formative interventionist study design involves an action-oriented research approach in which the researcher works *with* participants towards expanding learning and transformative agency (Mukwambo et al., 2023). In an insider formative interventionist design, the researcher becomes a 'scholar-activist', "in the process transforming both the agency of participating communities and researchers" (Mukwambo et al., 2023, p. 27). Consequently, in the study, I took the role of the insider formative interventionist researcher because I intended to work *with* teacher educators in investigating the mainstreaming of inclusive education in teacher education practice for pedagogical proficiency via ESD Change Projects in the Sustainability Starts with Teachers (SST) programme. The insider formative interventionist research design, framed using Engeström's expansive learning principles, helped me to focus on mediating the ZPD (see Chapter 3) and the expansion of inclusivity practices in ESD teacher professional development within and across participants' practices (Engeström, 2011; Engeström et al., 2014; Lotz-Sisitka & Pesanayi, 2019). Mukwambo et al. (2023) argued that the role of an insider formative interventionist researcher should be assumed with criticality and dialecticism. In this regard, they proffered seven dialectical dispositions that shape and inform the role of the insider formative interventionist researcher, as presented in Table 4.1 below.

Table 4.1: Dialectical dispositions in insider formative interventionist research

Dialectical dispositions in the role of insider formative interventionist	Manifestations of the seven dialectical dispositions in the role of insider formative interventionist
1. “Co-constructing the ethical-political trajectories and empathy necessary for decolonial transformative change, as a process of reparative futures-building in the lifeworlds of people.”	I aimed to interact with the participants ethically, clearly and meaningfully as we sought to co-engage and co-develop inclusive education practices using ESD activities through the SST programme.
2. “Affirming and advancing social, cognitive and hermeneutic justice in reparative futures co-construction.”	The transformative orientations of ESD (such as transformative learning, collaborative learning, whole school approach and community of practice) provided concrete strategies for mainstreaming inclusion in teacher education, discoursed from human development perspectives to support social and cognitive justice in education systems.
3. “Engaging in deeper level co-engaged inquiry into deep seated structural dynamics.”	I have been a teacher educator at universities in Malawi. The participants were teacher educators involved in the SST programme from Malawi, Tanzania and Eswatini. We both had historicised knowledge of exclusion dynamics in the education systems and their structural histories.
4. “Explicitly embracing an intention to support the transformative agency of other[s], including humbly realising that one’s own transformative agency can be expanded in the process.”	Being part of the SST programme helped me to be well-informed about the course and the study context and learnt from the participants. As such, I interacted with the participants from a closely aligned perspective while ensuring their rights, anonymity, autonomy and confidentiality and improving my reflexivity and co-learning.
5. “Embracing boundary crossing in ensuring the inclusion of sustainability science, governance systems perspectives, and social and community-based insights in the co-construction of alternative future together.”	A cross-boundary interrogation of the relationship between inclusivity, ESD and teacher education was reflexively engaged throughout the research process. This reflexivity was achieved by maintaining a reflective research journal, in which I continuously reflected on how sustainability principles could transform inclusivity practices and vice versa in teacher education.
6. “Adopting a grounded approach to research that embraces a dialectic of situated possibility constituted as a movement between what was, what is, what should and could be, and what is possible to do together.”	The outcome of the study was unbeknown to both me as a researcher and the participants. We engaged in it as a co-learning process. I was part of the research context while maintaining participants’ autonomy in Change Project areas where they needed support within their practices. Thus, my role did not take away their choices in implementing the Change Projects, rather it sought to support their expansion.
7. “Embracing [...] familiarity while seeking out the unknown with others, as well as the engagement-detachment dialectic in research with rigour and care.”	I enrolled and studied the SST course. I coordinated cluster meetings on the SST programme. I was equally acquainted with the intentions of the SST programme. However, participants and I collaborated to find out what the nexus between inclusivity, ESD and teacher education in a southern African context could look like.

Source: Mukwambo et al. (2023, pp. 34-35)

As motivated by Mukwambo et al. (2023), the formative interventionist design (especially the insider approach) is usually applied in Cultural Historical Activity Theory (CHAT) research which is an activity theoretical expansion of Vygotskian theory. However, the seven dialectical dispositions in Mukwambo et al. (2023) offer orientations and methodological guidance to other educational and social science research studies. I drew on this guidance applying analytical rigour, reflexivity and criticality. This role offered a methodological process orientation congruent with the broadly sociocultural orientation of the study while focusing on teacher educators’ activities (see Chapter 1 on my positionality in the research). In a formative interventionist design, a researcher is a collaborator and participants move collectively through the ZPD in a change laboratory workshop using double stimulation (multi-layered action-provoking support) tools (Mukwambo et al., 2023). In differentiating formative interventionist research from linear intervention designs, Engeström (2011) outlined four distinctive features, as shown in Table 4.2 below.

Table 4.2: Distinctive features of formative intervention

Feature	Linear intervention	Formative intervention
Starting point	“The contents and goals of the intervention are known ahead of time by the researchers, and the intervention itself is commonly detached from vital life activities of the participants.”	“The participants (whether children or adult practitioners, or both) face a problematic and contradictory object, embedded in their vital life activity, which they analyse and expand by constructing a novel concept, the contents of which are not known ahead of time to the researchers.”
Process	“The participants, typically teachers and students in school, are expected to execute the intervention without resistance. Difficulties of execution are interpreted as weaknesses in the design that are to be corrected by refining the design.”	“The contents and course of the intervention are subject to negotiation and the shape of the intervention is eventually up to the participants. Double stimulation as the core mechanism implies that the participants gain agency and take charge of the process.”
Outcome	“The aim is to complete a standardised solution module, typically a new learning environment, that will reliably generate the same desired outcomes when transferred and implemented in new settings.”	“The aim is to generate new concepts that may be used in other settings as frames for the design of locally appropriate new solutions. A key outcome of formative interventions is agency among the participants.”
Researcher’s role	“The researcher aims at control of all the variables.”	“The researcher aims at provoking and sustaining an expansive transformation process led and owned by the practitioners.”

Source: Engeström (2011, p. 606)

The study's context needed a more systematic understanding of how inclusive education is mainstreamed in, and aligned with, teacher education through ESD programmes in Malawi, Tanzania and Eswatini. Thus, the formative interventionist research design allowed the participants to work on how they wanted to be supported and expand their learning from their practice contradictions (Engeström & Sannino, 2010; Penuel, 2014; Sannino et al., 2016). I agree with Mukwambo et al. (2023) that the role of an insider formative interventionist researcher translates into a scholar-activist who engages in a support process whose outcome is not foreknown. As a scholar, I strongly desired to contribute to the common good through inclusivity but had no forehanded outcome of this co-engagement with the teacher educators in the three case studies from Malawi, Tanzania and Eswatini.

4.3 Qualitative Nested Case Study Approach

The study used a qualitative approach to investigate how inclusive education could be mainstreamed in teacher education for pedagogical proficiency through ESD in a southern African context. Scholars (see Aspers & Corte, 2019; Cohen et al., 2018; Silverman, 2020) pointed out that the qualitative study approach helps in explaining a phenomenon. For this study, a qualitative approach helped in explaining the nuanced relationship between inclusive education, ESD and teacher education. Other scholars (including Ary et al., 2018; Bhattacharya, 2017; Creswell & Guetterman, 2024; Creswell & Poth, 2024; Dawson, 2019) observed that this study approach also helps in understanding participants' practices. In this study, the qualitative approach helped in understanding teacher educators' experiences and focusing on co-transforming teacher educators' practices to pursue inclusive education's intent via ESD praxis.

The qualitative approach was implemented through nested case studies, as elaborated in Lotz-Sisitka and Raven (2004). As applied in Rule and John (2011), Hancock and Algozzine (2017), and Thomas (2021), a case study usually involves in-depth exploring and explaining a situation in a multi-layered approach. The case study was nested because each institution had its case of activity systems. All cases in one country formed one case, as illustrated in Figure 4.1 below. In the introductions to each of the case chapters (Chapters 5, 6 and 7), I give brief overviews of each case that was initially part of this study but, as motivated in each of the case chapters, one case was given full focus and support for co-engagement and analysis.

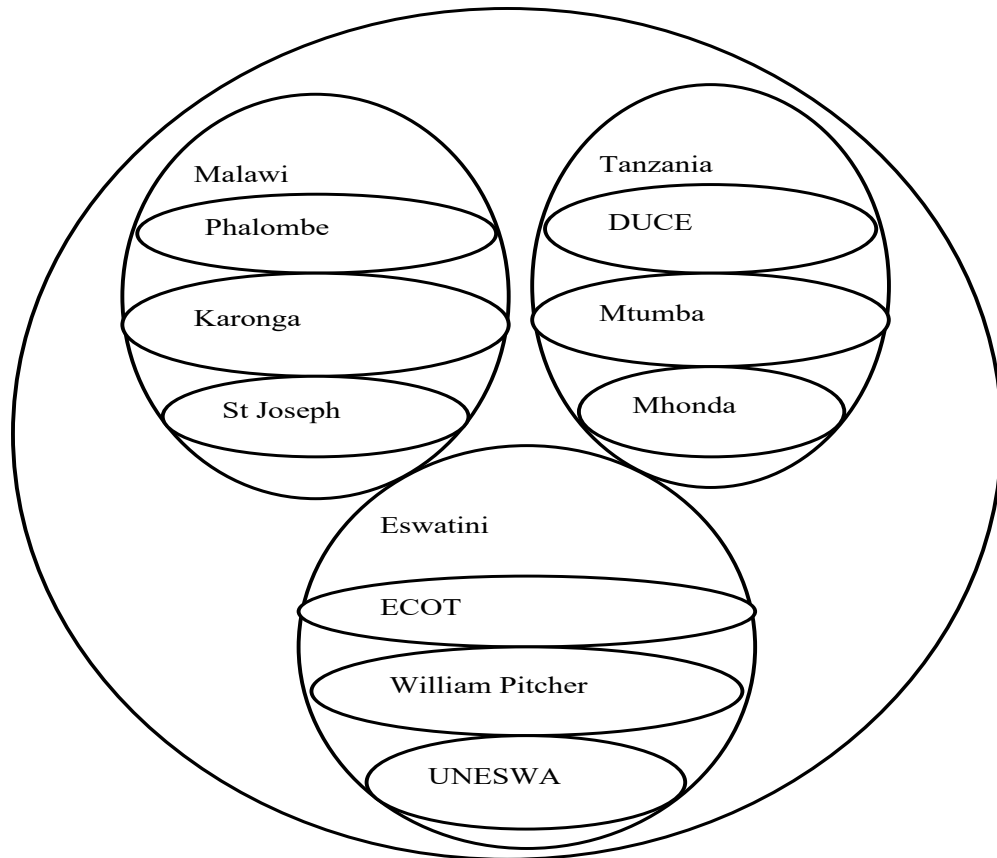


Figure 4.1: Nested case study design for the study

To manage the scope of this study, only one case from each country was co-engaged further for detailed analysis (see Chapters 5–7). To develop this study, I worked with a comparative educational research design that developed nested case studies of inclusivity in teacher education practice via ESD. The comparative dimensions came in because the cases were from different educational contexts; as a researcher, I had to continuously learn, unlearn and relearn aspects of the study from the cross-case analysis. Thus, as Dawson (2019) put it, the qualitative nested case study approach not only offered the direction of the study but also complemented the understanding of the research problem across contexts.

4.4 Critical Realist Philosophical Underlabouring

A philosophical lens for a study encompasses beliefs and views on reality (Ary et al., 2018; Cohen et al., 2018; Lang, 2020). The case study design was underlaboured by critical realist philosophy. The origins of critical realism are usually attributed to Roy Bhaskar, starting with his magnum opus, *A realist theory of science* (1975). At the core of Roy Bhaskar’s critical

realism are seven dialectically related laminated scales of reality, characterised by relations of emergence: sub-individual psychological, individual or biological, micro, meso, macro, mega, planetary or cosmological. These laminated scales partly map onto Bronfenbrenner's bioecological systems model (discussed in Chapter 3) but also ontologically ground any research manifested in a systems perspective (see Agbedahin & Lotz-Sisitka, 2019; Bhaskar, 2016; Schudel, 2015). The relevance of critical realism as a philosophy of science is justified at three dialectical levels: ontology, epistemology and methodology. Ontologically, critical realism is a "less restrictive perspective [thus offering] double greater inclusiveness" (Bhaskar & Danermark, 2006, p. 280). Epistemologically, critical realism is largely explanatory, suggestive and impartial (Bhaskar & Danermark, 2006). Methodologically, critical realism has "a necessarily laminated systems perspective" (Bhaskar & Danermark, 2006, p. 280).

Ontology focuses on the nature of reality that preoccupies an inquiry (Al-Ababneh, 2020; Guarino et al., 2009; Hart, 2010). The reality in this study is the mechanism shaping the inclusivity practices of teacher educators that emerged through ESD activities. The focus was on whether and how their practices were shaped to help pre-service teachers develop inclusive pedagogy that complements sustainable development or not. Not all teacher educators had similar practices regarding inclusivity. Thus, critical realism offered a less restrictive and more inclusive perspective, allowing the capturing of different meanings of teacher educators' practices.

Epistemology concerns itself with knowledge and how it is acquired (Flick, 2018a; Pernecky, 2016; Roth, 2019). The study's goal was to support and expand what participants were already doing. Thus, the study's epistemological standpoint was that teacher educators constructed their knowledge through practices and interactions. The study as a learning process was interested in how the teacher educators constructed knowledge. For instance, the study sought to explain how teacher educators understood inclusivity issues in teacher education via ESD praxis. Critical realism offered a dialectical arena to explain those understandings (see Chapter 8 on critical realism as an underlabourer in the study).

Methodologically, the focus is on the appropriateness of the chosen methods to generate data that address the research goal. This study assumed that the teacher educators had a multi-layered understanding of their practices. Thus, these practices could be better perceived through critical realism since it construes reality from a multi-layered point – a necessarily laminated system (Agbedahin & Lotz-Sisitka, 2019; Danermark & Bhaskar, 2006).

The study employed critical realism not as a theory but as an underlabourer that offered dialectical onto-epistemic grounding (see Ary et al., 2018; Cohen et al., 2018; Lang, 2020). Critical realism worked as an underlabourer for Bronfenbrenner’s bioecological model and Vygotsky’s sociocultural perspective. It helped interrogate the relationship between inclusive education, ESD and teacher education, recognising that education is an open system with transformative potential through the agency of teacher educators, teachers, learners and researchers (Tikly, 2015). I elaborate further on critical realism in Chapter 8 wherein cross-case research findings are discussed.

4.5 Sites, Participants and Selection Criteria

The study was conducted at universities or teacher training colleges in Malawi, Tanzania and Eswatini. The selection of the countries was based on the SST course and the education situations such as inclusive education policies. Initially, I planned to conduct the research in South Africa, Malawi and Mozambique. However, after deeper contextual profiling, I changed the countries to Malawi, Tanzania and Eswatini. This change was because I wanted to avoid suggesting what teacher educators should do in their Change Projects. Instead, I aimed to support what teacher educators were already doing. Thus, as much as the concerns that this study confronted were apparent in the initially chosen countries, no Change Projects in South Africa and Mozambique chose to focus specifically on inclusivity. Table 4.3 below shows the sites and number of participants for the three main cases.

Table 4.3: Sites and number of participants

Countries	Research Sites	Interview Participants	Workshop Participants
Malawi	Phalombe Teacher Training College (PETTC)	5	12
Tanzania	Dar es Salaam University College of Education (DUCE)	4	5
Eswatini	Eswatini College of Technology (ECOT)	3	7

I indicated in Figure 4.1 that I initially worked with three cases in each country. However, the focus was later switched to one primary case in each country which means that only one case from each country is reported in this thesis; however, references are made to the secondary cases where necessary (see Chapters 5–7). This selection meant 12 participants from the three countries participated in the interviews, while 24 were involved in a series of workshops. Although the participation number was relatively small, it was adequate for this qualitative research because more focus was needed on the depth of co-engagement. The participation number sufficed because the population from which the participants were drawn was homogenous (teacher educators), with emphasis on the depth of the research, as scholars like Boddy (2016), Dawson (2019), and Tutelman and Webster (2020) recommend.

The participants were purposively selected. Only those teacher educators addressing or interested in addressing inclusive education in their ESD Change Projects were approached to participate in the study. Scholars such as Ary et al. (2018), Cohen et al. (2018), and Creswell and Creswell (2022) would call the inclusivity-focused ESD Change Project the purpose for participant selection. The initial step for selecting the participants was a generic questionnaire (see Appendix 1) sent to all SST course participants from the three countries (approximately 150). About 100 participants responded to the questionnaire through their Reference Group Member. Then, the questionnaire was scrutinised to identify institutional Change Projects and participants addressing or interested in addressing the issue of inclusive education in their teacher education practices through ESD Change Projects. The identified participants were contacted through the Reference Group Members to arrange face-to-face meetings where I explained the research details. Then, participants who expressed interest in participating in the study were engaged further through the research process explained in this chapter. Although the questionnaire did not contribute data towards the study objectives, it was a key data source for the selection process and contextual profiling.

4.6 Data Generation Methods

The study used document review, interviews, observations, workshops and a research journal to generate data that helped investigate and interrogate the possible relationship between inclusive education, ESD and teacher education in a southern African context. These data generation methods resonated with the qualitative case study research approach undertaken because I could analyse processes, explain systems and historicise inclusivity practices in teacher education via ESD using critical realist philosophy.

4.6.1 Document review

Document review (see Appendix 2) involved collecting and analysing policy and curricula documents. Studies such as Bell (2014), Gasa and Mafora (2015), and Machi and McEvoy (2016) either used or recommended document review as an entry point to data generation involving human interaction. Firstly, the document review in this study focused on policy documents that guide ESD in teacher education. The review ascertained whether the documents afford teacher educators opportunities to design and implement inclusion-oriented teacher education programmes. Secondly, the document review in this study ascertained how policy enable or constrain inclusive education in teacher education via ESD practices. Studies that have used document review or explained it as a data generation method, including Johnston (2017) and Logan (2020), reported that the method is good when a researcher wants to gain an initial understanding of the phenomenon. In this study, the review raised an understanding of teacher educators' inclusivity practices, and this was probed further through interviews and during workshops.

4.6.2 Interviews

According to Tracy (2019), interviews (see Appendix 3) in qualitative research usually take a question-and-answer approach where the researcher and the participant(s) are afforded a platform to articulate their thoughts on the research problem in detail. In this study, 12 semi-structured interviews were conducted before formatively intervening in any of the participants' Change Projects. The intention was to probe how the study participants construed and contextualised teacher education and ESD in their projects as informed by the SST programme. As demonstrated in studies like Gudkova (2018), Hennink et al. (2020), and Jain (2021), this kind of interview allows a researcher to reiteratively analyse participants' discourse. In this study, semi-structured interviews allowed me to appreciate inclusive education discourses in the teacher educators' practices. The semi-structured interviews were one-on-one interactions between me and each of the 12 participants, after getting their consent to participate in the study and be audio-recorded. The interviews were audio-recorded to ensure easy referencing during data analysis, although, as put by Gibbs (2018), the analysis was an ongoing and synchronistical process. The interview participants' identities in the subsequent chapters (5-7) of this thesis are anonymised through index coding to represent the institution (e.g. P for PETTC), data method (i.e. I for interview) and participant name (e.g. 1), as shown in Table 4.4 below.

Table 4.4: Interview index codes

Countries	Institutions	Interview index codes
Malawi	Phalombe Teacher Training College (PETTC)	<ul style="list-style-type: none"> • PI1 • PI2 • PI3 • PI4 • PI5
Tanzania	Dar es Salaam University College of Education (DUCE)	<ul style="list-style-type: none"> • DI1 • DI2 • DI3 • DI4
Eswatini	Eswatini College of Technology (ECOT)	<ul style="list-style-type: none"> • EI1 • EI2 • EI3

4.6.3 Observations

In qualitative research, observation (see Appendix 4) “involves collecting data using one’s senses, especially looking and listening in a systematic and meaningful way” (McKechnie, 2008, p. 573). Scholars such as Ritchie et al. (2013) and Aspers and Corte (2019) observed that structured observations resonate well with qualitative research. In this study, three observations were purposefully structured at each institution to focus on the institutional, pedagogical and assessment. For the institutional observations, I focused on the objectives of the Change Projects and the opportunities the institution afforded to implement them. For the pedagogical observation, I focused on the pedagogical theories and practices that teacher educators used and recommend to pre-service teachers. In this regard, there were observations of Change Project implementation activities, including lectures and tutorials in some cases. For the assessment observation, the focus was on how teacher educators prepare teachers for effective assessment. Each teacher educator involved in lecture or tutorial observations was asked to secure consent from their pre-service teachers. It was beyond the scope of this study to engage the pre-service teachers as they were not the focus of the SST programme, hence I remained focused on the teacher educators.

Overall the observations centred on doing some project activities together with the participants, watching them teaching and looking at assessment tasks give to pre-service teachers. The observations are index coded as shown in Table 4.5 below.

Table 4.5: Observation coding

Countries	Institutions	Focus	Observation codes
Malawi	Phalombe Teacher Training College (PETTC)	Institutional	• PO1
		Pedagogical	• PO2
		Assessment	• PO3
Tanzania	Dar es Salaam University College of Education (DUCE)	Institutional	• DO1
		Pedagogical	• DO2
		Assessment	• DO3
Eswatini	Eswatini College of Technology (ECOT)	Institutional	• EO1
		Pedagogical	• EO2
		Assessment	• EO3

4.6.4 Workshops

Three in-person workshops were held per case, with nine workshops in total for the three countries. A workshop (see Appendix 5) involves participants building new knowledge from their practices (Ørngreen & Levinsen, 2017). The workshops were the main means of co-engaging the research participants in investigating, supporting, expanding and transforming inclusivity in teacher education via ESD in the ZPD. In this regard, the research participants were supported in working on their institutional Change Projects towards inclusive pedagogical proficiency – this became the focus of the formative intervention interactions. It is important to make a note here beforehand that much as I borrowed expansive learning methodological steps, where change laboratory workshops are used, I did not use such kind of workshops in this study (see Engeström, 2011 for details on change laboratory workshops). The workshops involved in this study were those that involve kind of a seminar in which participants and a researcher interact without strictly following the learning cycle of CHAT research. My innovation was to structure the workshops in a way that resonated with tenets of formative interventionist research design in which participants’ choices guide the process of project implementation (see Chapters 5-7). Workshop participant identities have been anonymised through index codes to represent institution (e.g. D for DUCE), data method (i.e. W for workshop) and participant name (e.g. A), as shown in Table 4.6 below.

Table 4.6: Workshop participants index codes

Countries	Institutions	Workshop participant index coding
Malawi	PETTC	PWA, PWB, PWC, PWD, PWE, PWF, PWG, PWH, PWI, PWJ, PWK, PWP
Tanzania	DUCE	DWA, DWB, DWC, DWD, DWE
Eswatini	ECOT	EWA, EWB, EWC, EWD, EWE, EWF, EWG

4.6.5 Research journal

A research journal (see Appendix 6) is a mini diary that a researcher uses to record events as they unfold. Scholars, including Bhattacharya (2017), Noh (2019) and Silverman (2020) argued that a research journal can help in managing the researcher’s positionality. In this study, the research journal afforded an opportunity to reflect on my positionality to minimise bias by continuously documenting how my actions related to the study objectives. I requested the participants also keep reflective journals, as suggested in Mukwambo et al., 2023; this served as another layer of checking my actions as an insider formative interventionist researcher. These journals were personal and private properties of the participants, as such, I did not have access to them. Instead, I urged the participants to document key developments during our co-engagements and report any areas of concern during our feedback sessions. Liong (2015) would argue that the critical reflection on positionality by the participants and I spoke to self-reflexivity and ethical adherence which are important in a qualitative study such as this one. There were many entries in my research journal for each case. However, I only refer to the entries that are significant to the discussion of the research findings in this study. These journal entries are index coded as shown in Table 4.7 below.

Table 4.7: Research journal entries coding examples

Countries	Institutions	Journal entry codes
Malawi	Phalombe Teacher Training College (PETTC)	<ul style="list-style-type: none"> • PJ1 • PJ2
Tanzania	Dar es Salaam University College of Education (DUCE)	<ul style="list-style-type: none"> • DJ1 • DJ2 • DJ3
Eswatini	Eswatini College of Technology (ECOT)	<ul style="list-style-type: none"> • EJ1 • EJ2

4.7 Expansive Data Generation and Learning Process

The study commenced with piloting. Piloting is mock research that involves similar participants, processes, methods and tools. It has been demonstrated in studies like Gumbo (2015), Mikuska (2017), and Malmqvist et al. (2019) that piloting enriches the main study. Since this study took a formative interventionist research approach, the piloting focused on testing the coherence of the design and the questions, but not all the intervention activities, as this approach already has a checking mechanism as the process unfold. After piloting was the main study with teacher educators through a process shown in Figure 4.2 below.

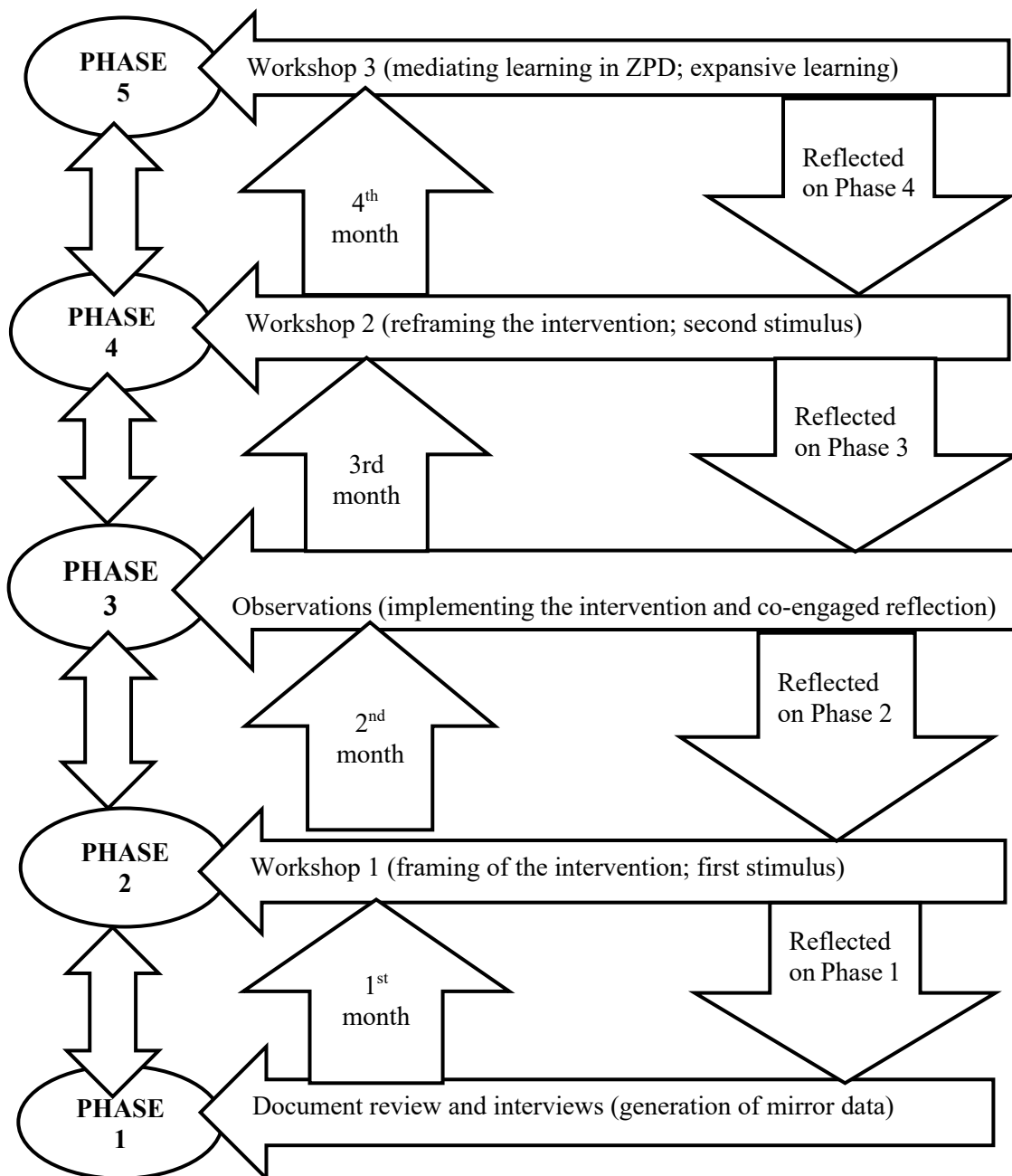


Figure 4.2: The five phases of the expansive research and learning process

As shown in Figure 4.2 above, data generation was in five phases, using insider formative interventionist research design principles adapted from CHAT research. The first phase involved gathering ‘mirror’ data using document review and individual interviews. In CHAT research, mirror data is a list of contradictions and sources of tension presented to research participants and stakeholders in change laboratory workshops (Engeström, 2011). Since I did not use change laboratory workshops, the mirror data gathered in the first phase was used in the ordinary workshops I conducted. I deduced the contradictions and sources of tension through document review and interviews. In the second phase, a workshop enhanced a better understanding of the problem and provided the *first stimulus* to engage the participants in expanding their learning. Thus, the initial framing of the intervention was done in collaboration with the participants (Engeström, 2011; Nuttall, 2020; Penuel, 2014; Postholm, 2020).

The third phase involved observing and reflecting on the practices of each Change Project in implementing the intervention agreed upon in the second phase. The fourth phase involved another workshop that followed the one done in the second phase. This phase was a mediating conceptual tool or a *second stimulus* for the participants (Engeström, 2011) and helped to bring out contradictions in their practices. The fifth phase was also a workshop intending to move towards transformation and change (Engeström, 2011). Throughout the research process, I worked with the participants by getting involved in the Change Project activities. For example, if there was an orientation or a training, I would attend and support them accordingly. The first instance I worked with the participants in all the cases was when we did the first workshop in the second phase and they expressed a need to be supported in certain aspects of the Change Projects (i.e. the reframing phase).

4.8 Data Management

Data was catalogued into five sets (one from each research phase) for each of the three research countries and three cases. Each data set addressed specific objectives and questions. After cataloguing, the data was also indexed. The indexing involved representing the data in a manner that does not reveal the participants’ identities by using index codes, as demonstrated earlier. The data sets were stored on a personal encrypted iCloud drive. The same data sets were securely stored in print to ensure a backup in case the electronic files got corrupted.

4.9 Data Analysis

This study worked with critical realism as an underlabourer to bioecological and sociocultural theories, and expansive learning process. This choice had implications for the data analysis which took place using two modes of inference: abduction and retroduction. Abduction recontextualises data using theory and develops the first level of explanation. Retroduction offers a second level of explanation and produces phenomena. Tikly (2015) observed:

In critical realism and unlike empiricism and interpretivism, theory is considered the primary ‘raw material’ for the productive work of researchers and this involves abduction and retroduction. Abduction is a formalised approach to inference. Unlike induction which moves from an observed phenomenon to generalised laws or deduction which moves from general laws to hypotheses and then to observed phenomenon abduction starts from a theory and then considers the extent to which it fits a case [..]. Retroduction is closely related to abduction but involves going a step further in seeking to establish through forms of argumentation what is basically characteristic and constitutive of the structures and mechanisms [that produce phenomena]. Retroduction involves asking ‘why’ about the evidence, about the theories and about the causes of the thing itself. (p. 247)

Data analysis was technically in two stages, as shown in Figure 4.3 below.

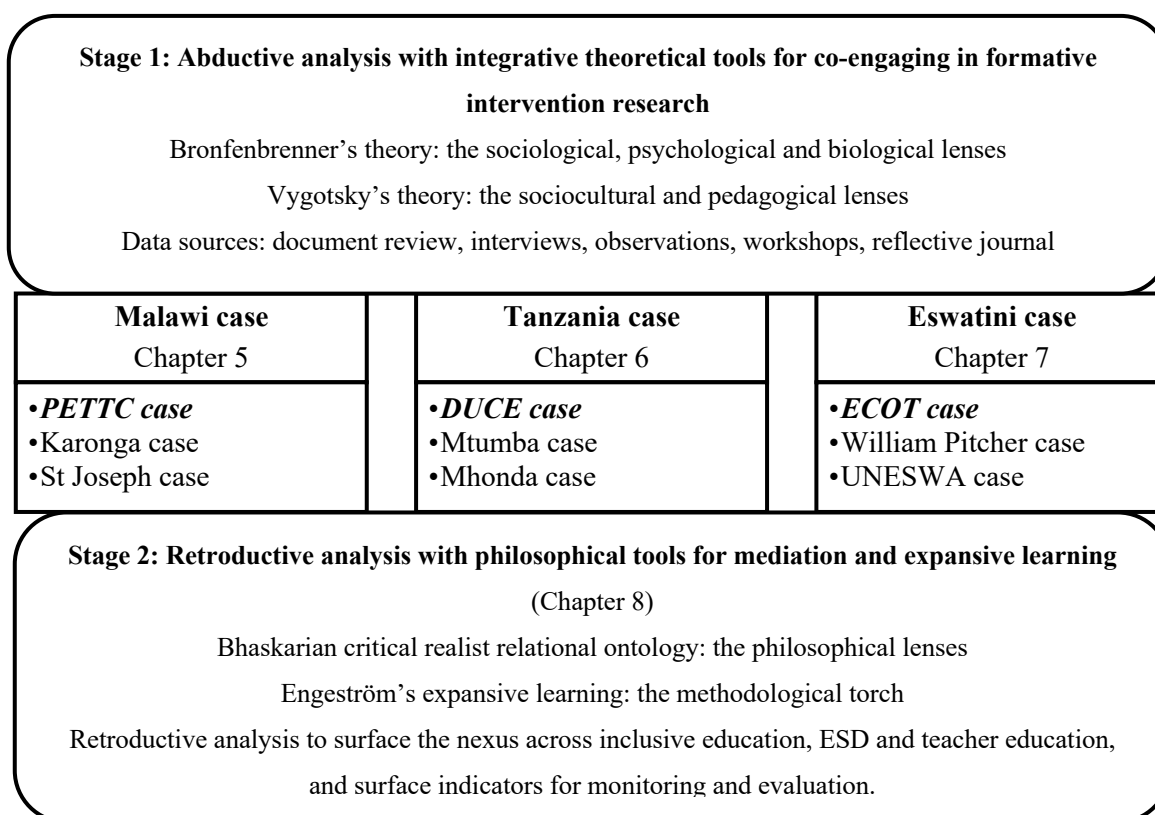


Figure 4.3: Co-engagement and analytical tool

The initial work was to do a thematic analysis of the research data. In this regard, central ideas from the research data were identified and grouped. Then, the first stage of data analysis focused on the theoretical framework and used abduction as a mode of inference to recontextualise and interpret the data in tandem with the critical realist philosophy (Chapters 5, 6 and 7). The second stage involved interrogating the theory, data and observations using retroductive analysis as a mode of inference to understand the ontological dynamics and causality (Chapter 8). The analytical tool in Figure 4.3 above yielded an analytical framework which categorised data according to emerging themes for further discussion, as shown in Table 4.8 below.

Table 4.8: Analytical framework

Inference	Research questions	Analysis tools	Data source
Abductive Recontextualise the research data drawing on theoretical perspectives	What is the current status quo of, before and after the SST programme, inclusive education mainstreaming in teacher education in Malawi, Tanzania and Eswatini in the context of ESD?	<ul style="list-style-type: none"> • Thematic analysis • Bioecological system theory (person component) • Sociocultural theory (zone of actual development) 	<ul style="list-style-type: none"> • Document review • Interviews for all the three country cases • Workshop 1 for all the three country cases
	How can teacher educators' existing knowledge, including the knowledge gained as a result of SST programme, potentially be expanded through formative intervention engagements for mainstreaming inclusive education in teacher education through ESD Change Projects?	<ul style="list-style-type: none"> • Thematic analysis • Bioecological system theory (process component) • Sociocultural theory (zone of proximal development [ZPD]) 	<ul style="list-style-type: none"> • Document review • Interviews for all the three country cases • Workshop 1 for all the three country cases
	What insights into the strengthening of mainstreaming of inclusive education in teacher education emerge; specifically, how can pedagogical proficiency be improved for teacher educators and what are the implications of this?	<ul style="list-style-type: none"> • Thematic analysis • Bioecological system theory (context and time component) • Sociocultural theory (ZPD) 	<ul style="list-style-type: none"> • Interviews for all the three country cases • Observations • Workshop 2 for all the three country cases

<p>Retroductive</p> <p>Probing the emergence of phenomena (What mechanisms shape realities and why things are what they are?)</p>	<p>From these inquiries (1–3 above), is it possible to surface indicators that can inform the monitoring and evaluation of inclusive education mainstreaming to contribute to the field of teacher education?</p>	<ul style="list-style-type: none"> • Critical realism (ontological lenses for surfacing indicators using laminated scales to emergent ontological frame for monitoring and evaluating inclusive education teacher education across ESD contexts) • Expansive learning (methodological guide for transformation and change) 	<ul style="list-style-type: none"> • Workshop 3 for all the three country cases • Research journal
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4.10 Validity and Trustworthiness

As discussed in Section 4.2, formative interventionist research aims at transformation and change. Thus, the validity and trustworthiness of this kind of research should be taken seriously. In this formative interventionist study, efforts were taken to ensure valid and trustworthy research. Usually, the validity concerns in qualitative research may be either internal, external or both (Cohen et al., 2018). In this study, both internal and external threats to validity were assessed and efforts were made to minimise these. Scholars like Baldwin (2018) and Gaber (2020) explained that internal threats to validity speak to how well the generated data can explain the research gap. Also, scholars like Flick (2018b) and Kumar (2019) explained that external threats to validity look at the implications of the study findings.

To minimise internal threats to validity, data were generated ethically while co-engaging participants in investigating the mainstreaming of inclusive education in teacher education for pedagogical proficiency using ESD praxis in the southern African context. This study employed triangulation as part of efforts towards minimising internal threats to validity. As illustrated in studies like Cicourel (2007), Heale and Forbes (2013), and Wilson (2014), a researcher employs different methods, theories and sources in triangulation, and then considers the information sources with each other, identifying convergencies and divergencies to develop consolidated explanations. In this study, different data generation methods, including interviews, observations and workshops, were used with the same participants and their responses were converged to address the research questions. Wilson (2014) would observe that the triangulation in this study mainly involved methods and the data generated.

When it comes to addressing external threats to the validity of trusted research, it is usually difficult to generalise results from qualitative research like this study. However, new schools of thought, such as Roald et al. (2021), are sceptical of this status quo. This situation implies

that some scholars believe qualitative research findings can be generalised with some caution. I neither agree nor disagree with this new thought because of this study's philosophical underlabouring. This study used critical realism philosophy to address external threats to validity because it allows generalisation at the mechanism level (Nunez, 2013). Therefore, this study used the mechanism dimension of critical realism to generalise the research results as a point of reference for monitoring and evaluating inclusive education in teacher education practice and strengthening SDG 4.7 targets in the three cases, three countries and Southern Africa (see Chapter 8). Importantly, the avoidance of invalid assumptions, overcoming bias and subjectivity, ensuring referential adequacy, engaging with critical friends, ensuring theoretical coherence, self-reflexivity and data verification through member-checking and feedback sessions were at the core of this study to enhance trustworthiness.

4.11 Ethical Considerations

Research ethics were carefully considered in this study. English was the language used and all the participants opted to co-engage in this language. Gatekeeper permission (see Appendix 7) was sought from UNESCO ROSA in Harare because the participants were contacted through the SST programme and permission was granted (see Appendix 8). Furthermore, after the selection process, there was a need to obtain institutional access permission from the head of each institution (see Appendix 9). The requests for permission to the three institutions were all granted (see Appendix 10 for PETTC permission, Appendix 11 for DUCE permission and Appendix 12 for ECOT permission). Individual consent to participate in the study was sought from each participant (see Appendix 13) by signing an informed consent form (see Appendix 14). Specifically, participants were requested to consent photographs to be used in this thesis, and they assented through the informed consent form. The research proposal was reviewed and approved by the Rhodes University Education Higher Degrees Committee (see Appendix 15). The overall ethics approval was sought from and granted by the Rhodes University Ethical Standards Committee (Education Sub-committee on Human Ethics) in two stages: provisional (see Appendix 16) and final (see Appendix 17) –approval number 2021–4989–6408. I used Rhodes University's annual postgraduate progress reporting system to communicate any significant research changes to the ethics committee –these were mainly the changes from the initially intended sites to new sites. Overall, voluntary participation and withdrawal, truthfulness and transparency, beneficence, anonymity and maleficence were emphasised in the study as part of ethical considerations.

4.12 Presentation of Research Findings

The next three chapters (5–7) present research findings using abductive analysis. There is no uniform approach for presenting findings from qualitative research regardless of the modes of inference in the analysis. Reay et al. (2019) identified five approaches to presenting research findings (Goioia, the Vignettes, the Temporal Phases, the Long Data Excerpts and the Anthropological). While the Goioia approach involves “showing data as evidence of conceptual categories”, the Vignettes approach is a “more narrative-based mode of presenting findings” (Reay et al., 2019, pp. 7–8). They further designated the Temporal Phases approach as a way of presenting data that is based on a “defined temporal narrative” and the Long Data Excerpts approach as involving “raw data [rather] than author developed short stories” while the Anthropological approach entails “a holistic representation of the data” (pp. 10–13). As expected from any categorisation, the approaches are neither exhaustive nor exclusive. There may be other approaches to presenting research findings which may overlap.

The presentation of the research findings in Chapters 5–7 does not claim to fall neatly into one of the abovementioned approaches. Instead, it takes a hybrid approach to the presentation of research findings. However, the method of presentation in the next three chapters (5–7) heavily leans towards combining and synthesising the Goioia, Vignettes and Long Data Experts. In this regard, the presentation depends more on thick descriptions of the data. This means that in some cases, long excerpts from policy documents, and the participants’ responses during interviews and workshops are quoted as evidence for theoretical claims made to discuss the implications of the findings. Even so, I could not manage to capture all the responses from the interviews and workshops into this thesis text. These are available in detailed analytical memos deposited into Rhodes University Library Digital Commons (Research Data)⁷. In Chapters 5, 6 and 7 that follow, the presentation of each case begins with contextualising the case or Change Project, in tandem with the critical realist philosophy, and then presents the research findings recontextualised through the theoretical lenses of the study and guided by the expansive learning methodological torch.

⁷ <https://doi.org/10.21504/RUR.26426032.v1>

4.13 Conclusion

This chapter reported on the research design and methodology used in the study. The study took an insider formative interventionist design. It used a qualitative nested case study approach where SST ESD Change Projects on inclusive education in teacher education from Malawi, Tanzania and Eswatini became cases for co-engagement and reflexive analysis. The chapter also reported that member-checking was done as the research process unfolded by mirroring the discussions of each preceding session. Through member-checking, the participants verified their responses and confirmed or challenged initial findings. Member-checking also provided another layer for analysing the research findings with the participants. The next three chapters (5–7) abductively analyse the research data and thematically present the findings, starting with the Malawi case (Chapter 5), then the Eswatini case (Chapter 6) and finally the Tanzania case (Chapter 7).

CHAPTER 5

SUPPORTING INCLUSIVITY IN ESD TEACHER EDUCATION: MALAWI

5.1 Introduction

This chapter presents a case study on mainstreaming inclusive education in teacher education in the context of Education for Sustainable Development (ESD) in Malawi. I initially worked with three teacher training colleges, namely Phalombe, Karonga and St Joseph, as part of the research scope and piloting. The Phalombe ESD team worked on issues concerning recycling waste into sustainable energy sources and inclusive teaching and learning materials. The Karonga case involved pomology, in which the ESD team worked on planting fruit trees around the campus to aid the nutrition of pre-service teachers. The St Joseph case focused on the reforestation of the campus to mitigate flooding that affects the college. All these Sustainability Starts with Teachers (SST) ESD Change Projects had some inclusivity dimensions.

However, the three cases proved too extensive to give full attention and support. Therefore, I narrowed it down to one case and gave it full support and analysis. In this regard, I worked with teacher educators involved in the SST programme at the Phalombe Teacher Training College (PETTC). The PETTC case followed the research process reported in Chapter 4. The first phase was the generation of mirror data where a document review was done, and interviews were conducted with five selected teacher educators. The second phase involved a workshop in which the PETTC participants framed the intervention with me as a formative interventionist research facilitator. Then, we moved to the third phase, where observations were employed in implementing the intervention agreements and co-engaged reflections. Another workshop was convened in the fourth phase, in which participants and I came together to reframe the intervention. The last phase, the fifth one, involved mediating the zone of proximal development (ZPD) and working on expansive learning for the participants and myself as an insider researcher. I took one year working with the PETTC participants on different aspects of the intervention. Nevertheless, the timing of interviews and workshops were conducted in two slots over four months. Member checking and feedback sessions were convened after the initial data analysis of each research phase. Figure 5.1. below summarises the PETTC research process.

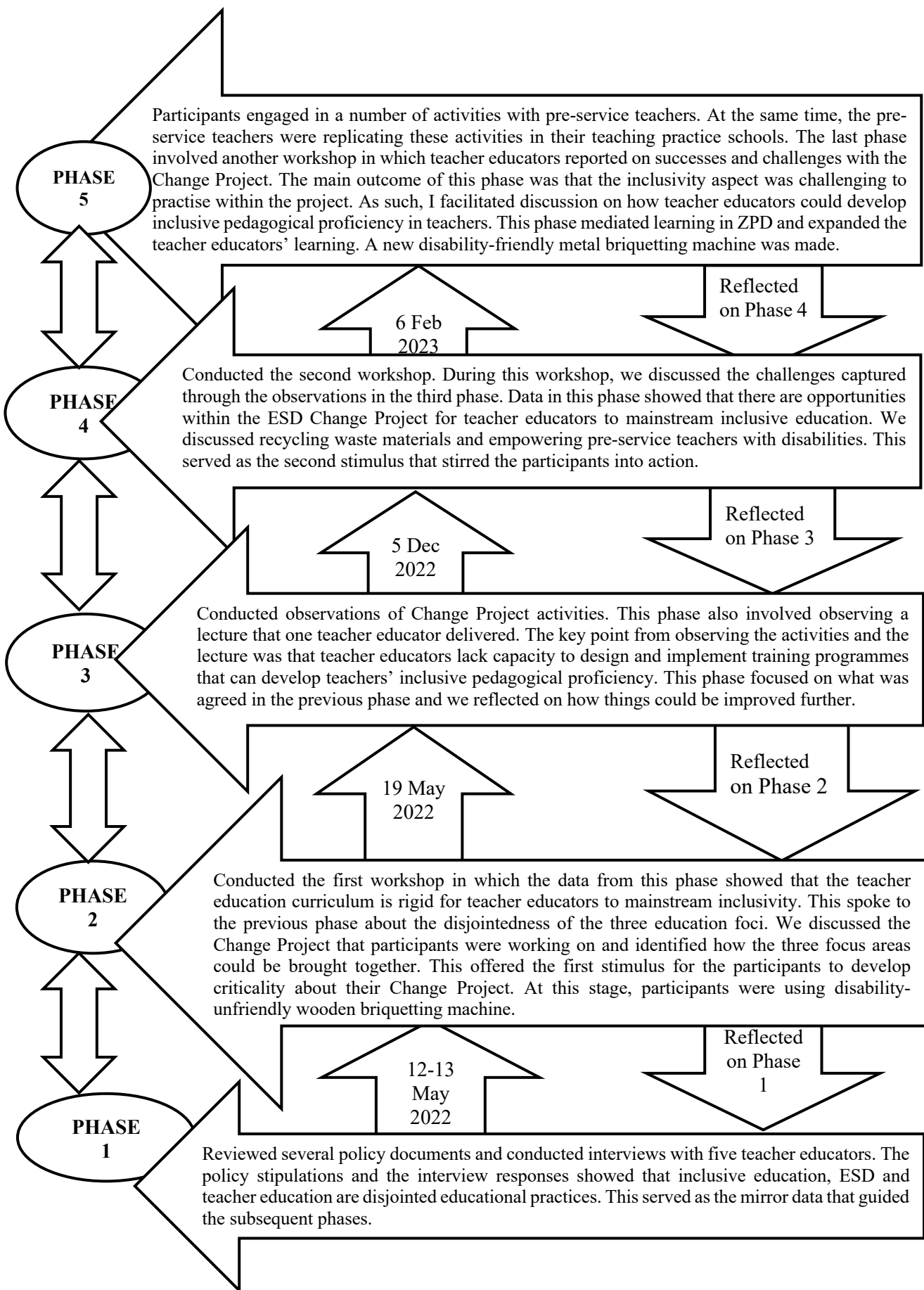


Figure 5.1: Summary of PETTC case research process

5.2 PETTC Change Project and Formative Intervention Process

The PETTC is one of the government institutions mandated to train primary school teachers in Malawi. The college is situated in the Phalombe district in the country's southern region. Teachers trained at PETTC are deployed within the college catchment districts of Phalombe, Mulanje and Zomba to do their teaching practice. The college enrolls pre-service teachers from varied sociocultural backgrounds and with distinct biopsychological characteristics, including pre-service teachers with disabilities such as visual and hearing impairments. Following a virtual national workshop for the SST programme on ESD in March 2021, the PETTC joined other teacher education and Technical and Vocational Education and Training (TVET) institutions in Malawi, Tanzania and Eswatini in the programme's third cohort (2021–2022), as indicated in Chapter 1.

The PETTC SST participants (teacher educators) chose to name their ESD Change Project *Pamtondo* (mortar and pestle). In the typical Malawian cultural and traditional settings, *Pamtondo* creates a platform for people, especially women, to gather to pound maize for flour while discussing matters such as their husbands' extramarital affairs and teenage girls who lack respect for elders. However, the PETTC SST team borrowed this concept for the ESD Change Project. The underlying notion was that people came together to discuss and solve ESD issues confronting their institution and country. In the *Pamtondo* ESD Change Project, teacher educators worked collaboratively with pre-service teachers, including those with disabilities, using their creative thinking abilities and applying knowledge from various disciplines to address critical societal issues as part of the SST programme.

In a bioecological systems model sense, the PETTC case was a complex, evolving human development process in the context of efforts towards transformation. The case was a two-fold developmental process. Firstly, it engaged in the "continuity and change in the biopsychological characteristics of human beings" (Bronfenbrenner, 2005, p. 4). In this sense, the PETTC ESD team comprised teacher educators and pre-service teachers of differing abilities in which their biopsychological features such as disabilities presented opportunities rather than incapability for learning. Secondly, the *Pamtondo* case engaged in the co-design process of "the development of scientific tools ... for assessing continuity and change" (Bronfenbrenner, 2005, p. 4). In this second sense, the team designed a Change Project model to reflect on and transform their inclusivity practices in teacher education via ESD praxis.

5.2.1 Inception design

As a requirement of the SST programme, a Change Project was initiated based on knowledge, skills, values and attitudes gained from participating in the SST training. The community of practice reviewed the context and examined local, sustainable development concerns of the PETTC. It was established that cutting down trees for firewood and charcoal and lacking vocational and entrepreneurial skills among (1) pre-service teachers with disabilities and (2) learners with diverse needs in teaching practice schools were some of the major sustainability and inclusivity challenges confronting the college, the surrounding communities and the teaching practice schools. Consequently, an inclusion-oriented teacher education intervention was designed and adopted under the *Pamtondo* ESD Change Project to address these challenges.

This inception design resonates with and refers to what Bronfenbrenner (2005) termed “interconnected systems” (p. 1) in pursuit of bioecological human development. This situation is so because the *Pamtondo* ESD Change Project encouraged pre-service teachers to work with teacher educators to solve local, sustainable development concerns. It also aspired to promote the plight of all learners, including those with diverse educational needs in the teaching practice schools. In a Bronfenbrennerian sense, the PETTC ESD Change Project recognised that the bioecological environment of teacher education praxis has profound influences not only on the microsystem (the teacher educators) but also on the mesosystem (the pre-service teachers) and indeed the exosystem (the learners in schools).

This influence is directed at addressing Sustainable Development Goal (SDG) 4, which seeks to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” (UN, 2015), and SDG 13, which advocates taking urgent action to combat climate change and its impact. Based on the inception outlook of the *Pamtondo* ESD Change Project, the design took a “discovery mode [which was capable of] providing scientific bases for the design of effective social policies and programs that can counteract newly emerging developmentally disruptive influences” (Bronfenbrenner, 2005, p. 4). In this regard, the PETTC ESD Change Project attempted to translate into action various policy frameworks, such as the Malawi Vision 2063 First 10 Years Implementation Plan (2021–2030) which strongly recognises sustainability and inclusivity as key enablers.

5.2.2 Situational analysis

Uncertainty over cost-effective alternative energy sources for cooking and heating, coupled with poverty and a lack of awareness of sustainable development, has forced communities to over-exploit forest resources around the PETTC. This situation has resulted in serious environmental problems that heavily challenge the successful attainment of the SDGs. The bioecological theory of human development argues that life involves complex interactions of different systems that have profound influences and consequences on myriad structures in the ecosystem (Bronfenbrenner, 2005). In this situation, the communities around the PETTC have unsustainable life practices that affect others within the ecology, as in the case of Mwananyani and Michesi hills, which are of special significance to the college and the surrounding communities. The hills' physical, biological and chemical ecosystems interact to perform certain functions such as air purification, local climate stabilisation, temperature and rainfall, and protection from storms. Community members depend on the hills not only for firewood and charcoal but also to get fruits, herbs and building materials such as thatch grass. Besides, when green, Mwananyani Hill provides beautiful background scenery in the college's vicinity.

However, despite these tremendous benefits, the vegetation covering the hills is highly endangered due to over-exploitation. Many trees are cut down for charcoal and firewood. Community leaders, government agencies and non-governmental organisations have tried to limit the cutting down of trees from the hills. However, they have faced strong resistance from the local communities due to the uncertainty of cost-effective alternatives that could be sources of income. In contrast, a lot of paper is wasted every day by the college and teaching practice schools. Teachers and learners use mostly paper-based references, supplementary materials, and teaching, learning and assessment resources for effective teaching and learning. In addition, most teaching, learning and assessment resources, such as textbooks, chalk and exercise books, are supplied in cartons that need proper management after use. Unfortunately, outdated books pile up in storerooms for years before being burnt to create space for new stock. Furthermore, paper teaching, learning and assessment resources that overspill the resource banks are burnt or thrown into rubbish bins.

Therefore, a contradiction was evident in the PETTC case study when we consider the wanton destruction of nature versus enormous paper resources in the college and teaching practice schools in which the latter could replace the former in use. In a Vygotskian sense, the *Pamtondo* ESD Change Project knew this situation as what could be termed an ADL. The teacher

educators had achieved this level of understanding of their context and practices that could be said to be the two layers of “causality in human action” – the achieved layers are “interpretive” and “contradictory” (Engeström, 2011, p. 610). In a formative design understanding, what lay ahead for the PETTC situation was the “agentive layer” (Engeström, 2011, p. 610) in which the *Pamtondo* ESD Change Project had to take on an action learning framework underpinned by the pedagogical principle of learning through activities.

The *Pamtondo* ESD Change Project was inceptioned with an understanding that teacher education institutions should engage in action teaching and learning for inclusive, sustainable development. This could enable pre-service teachers and all learners, including those with diverse educational needs, to not only demonstrate responsibility in environmental conservation and waste management but also acquire vocational and entrepreneurial skills for their empowerment. This could make them embrace the social skill of inclusivity while providing environment-friendly and cost-effective alternative energy sources for heating and cooking in their communities.

The PETTC SST teacher educators set the following objectives to employ active teaching and learning to ensure environmental sustainability while promoting inclusivity for pre-service teachers and consequently learners with diverse needs in schools:

1. Mobilise pre-service teachers and learners to apply curriculum content to solve local, sustainable development concerns.
2. Increase pre-service teachers’ and communities’ awareness of sustainable development and inclusive education.
3. Support pre-service teachers and learners, including those with diverse needs, to gain entrepreneurial and vocational skills.
4. Provide an environmentally friendly alternative energy source to firewood and charcoal through wastepaper management.

5.2.3 Practical orientations

The *Pamtondo* ESD Change Project was implemented in three phases. During the first phase, teacher educators worked with pre-service teachers to examine local, sustainable development concerns and modelled an intervention: briquetting wastepaper for cooking. They also raised awareness among other teacher educators, pre-service teachers and local communities. All

activities in this phase were designed to prepare the participants for phase two. In the second phase of the Change Project, teacher educators and pre-service teachers facilitated the formation of *Pamtondo* ESD clubs. Membership in the *Pamtondo* ESD clubs was voluntary, but it was highly recommended that pre-service teachers with disabilities be encouraged to participate. This encouragement was recommended because the Change Project had vocational and entrepreneurship elements critical for self-empowerment.

The *Pamtondo* ESD clubs in the teaching practice schools mirrored the intervention modelled in phase one. Members engaged in the intervention product's production, packaging, advertising and selling. Towards the end of each school term, clubs exhibited their handiwork and raised awareness in local communities. The awareness was intended to divert communities from heavy dependency on firewood and charcoal to using environment-friendly and cost-effective alternatives. The third phase involved teacher educators and pre-service teachers working in groups to report successes, challenges and suggestions for improvement. This phase was done when pre-service teachers had finished their teaching practices and were back in the college. Lessons learnt were meant for scaling up and improving the Change Project for subsequent cohorts of pre-service teachers at the PETTC.

The practical orientations of the *Pamtondo* ESD Change Project reflected a co-engagement process of systematic interactions over an extended period. In the bioecological model understanding, these PETTC SST teacher educators engaged in proximal processes for spearheading and responding to the human development challenges in their biocultural context (Bronfenbrenner, 2005). As Bronfenbrenner (posthumously) and Morris (2006) theorised, the teacher educators went beyond the mesosystem, their cycle of practice, to funnel through the other bioecological systems towards a common cause and good. Nonetheless, from the *Pamtondo* ESD Change Project's orientation, the participants and I observed that the unit of analysis, i.e. inclusivity, was not explicit. This situation showed contradictory layers for action which necessitated formative intervention research and co-engaged support.

5.2.4 Before the formative intervention

The *Pamtondo* ESD Change Project at the PETTC was officially launched in November 2021. The launch aimed to mobilise as many teacher educators and pre-service teachers as possible to join the college-based *Pamtondo* ESD club. Following the mobilisation exercise, members (teacher educators and pre-service teachers) met to discuss how they could use the concept of

levers under the topic ‘Simple Machines’ in the Science and Technology curriculum of primary teacher education in Malawi to press waste paper and other organic residues into briquettes. They came up with two alternatives: (1) devise a simple briquette press and (2) squeeze using hands. They settled for the first option.

In the same month (November 2021), they met to make a simple briquette machine using wood available within the college. To address environmental degradation, a topic in the social and environmental sciences curriculum of primary teacher education in Malawi, members of the *Pamtondo* ESD Change Project met again in November 2021 to start making briquettes from wastepaper. As the members were doing all this work, they also discussed inclusive education concepts in the Education Foundation Studies curriculum and why it is critical to attaining the SDGs. The outcomes under this objective demonstrated advanced learning, where the participants did not just learn for knowledge but used learning to solve problems. Figure 5.2 below shows the *Pamtondo* SST community of practice at PETTC making the simple briquetting machine.



Figure 5.2: Making simple wooden briquette presses

5.2.5 During formative intervention

As presented in Chapter 4, the research process unfolded in five phases. These phases spoke to the trajectory of formative intervention, encompassing the first stimulus, second stimulus, contractions and resolutions (see Engeström, 2011). To generate mirror data, I did a document review of various policy frameworks that inform inclusive education in teacher education in Malawi. Then, I conducted interviews with selected teacher educators. What happened in the PETTC *Pamtondo* ESD Change Project before the formative intervention could be understood in what Vygotsky (1978) termed the ‘ADL’ where teacher educators and pre-service teachers used their already acquired knowledge from and through the curriculum to design the intervention. However, the ADL can be described as a young plant enclosed in a container which can hardly grow but when placed in an open space, it sprouts and flourishes.

The interviews I conducted with the teacher educators enabled the emergence of new perspectives on the Change Project, which were eventually mirrored in the first workshop. The interviews challenged individual teacher educators to address overdependence on charcoal and firewood in the area. The members agreed to make briquettes from waste paper and other plant residues. After the interviews, I convened a workshop with the Change Project participants. This workshop offered the first stimulus for the participants. Engeström (2011) called the first stimulus “the problem to be tackled” (p. 621). In this study, the problem to be tackled was the implicit inclusive education dimension in the Change Project. During the first workshop, we discussed that recycling the waste explicitly speaks to the ESD dimension; engaging pre-service teachers brought the context to teacher education but the inclusivity aspect could not be explicitly articulated.

In the third phase of the formative intervention, participants co-engaged in implementing improvements to the inclusive education dimension. As a researcher, I conducted more observations in this phase. The observations were necessary in this phase because

[i]n contrast to variable-based research, process-oriented research believes that causation can actually be observed and reconstructed as a real sequence of events. It uses historical methods and narrative evidence, as well as *close observation* and recording of unfolding chains of events. (Engeström, 2011, p. 610, my emphasis)

To borrow Engeström’s words, this study was process-oriented and interested in investigating the mainstreaming of inclusive education in teacher education practice via ESD. Thus, when implementing the *Pamtondo* ESD Change Project, in April 2022, teacher educators and pre-service teachers were allocated for school-based teaching experience to various teaching practice schools within Phalombe, Mulanje and Zomba districts in Malawi. In their teaching practice schools, the participants started school-based *Pamtondo* ESD clubs, with membership open to every learner. The members met at the club level on specific days to make briquettes and discuss inclusivity matters. I visited and observed some of the activities, as shown in Figure 5.3 below.



Figure 5.3: Briquettes made from waste paper

In the fourth phase of the formative intervention, the participants and I worked to reframe the intervention to address the emergent issues observed from the preceding phase. This phase offered a second stimulus to the participants through another workshop. According to Engeström (2011), the second stimulus entails “the mediating artifact” (p. 621). In this case, the mediating artefact was the experience from the implementation activities which showed

contradictions in practice. Teacher educators and pre-service teachers carried out piloting work in making briquettes using locally available resources. They designed a simple briquette machine made of wood. Unfortunately, the machine could not provide the pressure to make briquettes from plant residue. Alternatively, the participants made briquettes from the wastepaper by soaking and squeezing the paper pulp softened by water with their hands. Also, the wood machine needed to be disability friendly.

Thus, as much as *Pamtondo* encouraged the participation of persons with disabilities the machine was not inclusive which proved contradictory. Again, the wooden machine would easily break and needed the participants to fetch more timber for new wooden briquetting presses. This development proved unsustainable even though the Change Project reinvigorated sustainability. This situation reminds us that “contradictions are not the same as problems or conflicts. Contradictions are historically accumulating structural tensions within and between activity systems” (Engeström, 2011, p. 609) – this was evident in the PETTC case concerning inclusivity as the object for co-engagement via sustainability processes. Also, the briquettes produced by the wooden machine were smoky and less efficient in energy production. Figure 5.4 below shows the wooden machine that was disability unfriendly and unsustainable.



Figure 5.4: Simple briquette machine made from wood

The fifth phase of the formative intervention in the *Pamtondo* Change Project involved another workshop. This workshop focused on resolutions and mediating the ZPD while expanding the participants' learning. After learning from the formative interventionist research workshop that I facilitated, the *Pamtondo* Change Project members devised a new briquette machine. This new machine responded to the two challenges: (1) the new machine encompassed features that made it disability friendly, and (2) the new machine was made of metal which made it durable. The *Pamtondo* ESD Change Project teacher educators worked with a local artisan to make the machine from waste metal. This development vindicated Bronfenbrenner's proposition that the focal individual in the microsystem (the teacher educators) does not exist independent of other influencing and contributing bioecological systems within the context component of human development. The collaboration with the local artisan, which can be theorised as an exosystem to the *Pamtondo* ESD Change Project participants, showed that the five bioecological systems were intertwined and related in pursuing transformative, inclusive and sustainable change. The involvement of the local artisan also speaks to Vygotsky's claim that moving from the ADL to ZPD would require support from more capable peers or adults with more experience with the phenomenon at hand. Figure 5.5 below shows the improved briquetting machine.



Figure 5.5: Briquette machine made from waste metal

The machine shown in Figure 5.5 above is more disability friendly because it has compensatory structural features; for example, if an individual has paralysed arms, they can apply legs to run the machine and vice versa. In the wooden machine, one needed both arms and legs to operate it. Again, with structural features that clearly protruded, unlike the wooden one, even a visually impaired individual could navigate and operate it. In terms of the smoke produced, the machine above produced less smoky briquettes because it had more pressing power that ensured the water was firmly pressed out of the soaked paper.

5.2.6 After the formative intervention

Arguably, if the *Pamtondo* team had not been supported it is unlikely that their contradiction on deforestation and waste paper management with inclusivity as the common good would have resulted in transformative change. This situation is so because expanded learning usually flourishes with the help of more capable peers and adults (Vygotsky, 1978). In other words, as a researcher, I could see the *Pamtondo* participants' ADL and their potential to innovate beyond the simple wooden briquette machine while addressing issues of inclusivity in teacher education practice towards inclusive pedagogical proficiency. In Vygotskian wording, that potential would be the participants' ZPD which enabled the possibility of formative intervention and support.

The contradictions and resolutions made in the Change Project could be contextualised in Vygotsky's (1978) notion that "in making one step in learning, a child [person] makes two steps in development, that is, learning and development do not coincide" (p. 84). Of course, in the context of this study, PETTC SST teacher educators replace the 'child' as the Person component of the analysis (Bronfenbrenner, 2005). The "one step in learning" entails the formative interventionist research activities that the PETTC participants engaged in and contributed to, whereas "development" entails their new teacher education practices. The insights from the insider formative interventionist research allowed the participants to expand their knowledge from the disability-unfriendly and unsustainable machine to an inclusive and sustainable machine regardless of what Vygotsky calls the developmental age at which the participants were. Thus, the participants' learning and actions were expanded via their interactions in and through the formative interventionist research workshops (Vygotsky, 1978).

In explaining further Bronfenbrenner’s ecological systems theory, Wong et al. (2020) noted that situations such as the PETTC case are of a “dynamic interactive nature” (p. 33). In other words, the local artisan is part of the systems that influence inclusivity in the PETTC teacher education praxis via ESD, even though he was not directly involved in teacher training. The synergies that the *Pamtondo* ESD Change Project procured for inclusivity in teacher education via ESD also resonate with the very core principles of ESD especially the idea of learning with and from others collaboratively.

Using the new machine, the *Pamtondo* ESD Change Project could now make less smoky and more efficient briquettes from other materials, such as rice husks, which are abundant in Phalombe, Mulanje and Zomba districts. As explained earlier, the machine also made it easy for persons with disabilities to be involved in ESD activities. Mukwambo et al. (2023) argued that participants in formative interventionist research would be more eager to engage in the activities if the cause contributes to change in and across their practices. The relevance of the researchers’ intervention should not be a mere assumption of themselves but be evident from the participants’ responsive activities. Accordingly, the *Pamtondo* ESD Change Project participants were very motivated to continue and scale up their Change Project activities because they were excited about how they transformed the wooden machine into a metal one with enormous benefits. Figure 5.6 below shows the improved briquette machine in use, which was the key outcome of the formative interventionist research.



Figure 5.6: The improved briquette metallic machine in use

5.2.7 Key outcomes

Through the formative interventionist research workshops, I worked with the *Pamtondo* Change Project participants to enhance the capacity of the artisan to train at least one local artisan in each teaching practice school so that when pre-service teachers are deployed for teaching practice, briquette machines are readily available. This challenge resonates with Bronfenbrenner's argument that change in human development becomes a habit and the influencing activity needs to reoccur over time. I wanted to encourage participants not to stop their ESD activities just because they managed to produce a new machine. I saw this as the beginning of their quest to make an impact on issues concerning inclusivity in teacher education via ESD. I also challenged the *Pamtondo* participants to ensure that learners who demonstrated proficiency in the school-based clubs should be supported to form community-based *Pamtondo* ESD clubs open to community members of any age, gender or disability. This situation brings to the fore the macrosystem's influence on the inclusivity unit. The community in the Process-Person-Context-Time (or PPCT model) represents the macrosystem that profoundly influences teacher training. The *Pamtondo* ESD Change Project demonstrated how transformative change can reach out to the wider local population within a short time. Through the ESD Change Project, the populace from the project area was diverted from clearing woodlands and forests for income and fuel to making and using briquettes.

Teacher educators, pre-service teachers and learners in the teaching practice schools developed the necessary skills, knowledge, values and attitudes necessary for environmental integrity and inclusivity. The *Pamtondo* Change Project modelled how the teacher education curriculum can incorporate active learning as a transformative pedagogy to address critical issues such as inclusive education and sustainable development. It also revealed that learning in the 21st century promotes core competencies such as critical and systemic thinking, collaborative decision-making and taking responsibility for present and future generations. Engeström (2011) argued that "for formative interventions, the key implication of transformation of practice as concept formation is that the analyst needs to trace steps of expansive concept formation, from early unstable attempts and suggestions to stabilization steps such as naming and modelling" (p. 612). Thus, I have demonstrated how the *Pamtondo* Change Project evolved from a simple contradictory idea to a more complex and stabilised concept of inclusivity and ESD-associated practice. Thus far, I agree with Vygotsky that if individuals can be supported

based on their present concrete knowledge, they can work through and demonstrate higher-order abilities to do tasks beyond that present knowledge.

5.3 PETTC Research Findings and Analysis

This section takes the data analysis and presentation of the findings to an abductive level. The section interrogates the emergent themes through the lenses of the study's theoretical framework: Bronfenbrenner's (2005) bioecological theory of human development and Vygotsky's (1978) sociocultural theory of learning. Thematic analysis was employed to identify central ideas from the research data sources, including documents, interviews, observations, workshops and reflections, as reported in Chapter 4. In some instances, long quotes from the participants' responses are included to give thick descriptions (see Section 4.12) of their thoughts and propositions. I highlighted earlier that within the nexus between inclusive education, ESD and teacher education, the *Pamtondo* Change Project required more significant support with the inclusivity dimension. Therefore, the analytical focus here centres on the formative intervention provided to support the inclusivity component of the Change Project. Still, ESD received support on par with that provided to teacher education.

5.3.1 Biopsychosocial characteristics shaped conceptualisations in PETTC case

For this study, the Person component entailed the teacher educators as individuals, teacher education practices, experiences and personal beliefs about inclusivity and ESD. Thus, it was imperative to understand the three notions of inclusive education, ESD and teacher education from the viewpoints of the PETTC SST research participants and policy documents. These conceptualisations of inclusive education, ESD and teacher education have implications for how biopsychological characteristics that affect inclusivity are approached and supported. The study assumed that the conceptualisations influence how the participants engage in their practices in these three foci.

Evidence from the document review, interviews, observations and workshops shared in this section show that inclusive education is conceptualised differently per context within and across teacher education practices. Inclusive education is understood as an Education for All agenda and a twin-track education system discussed in more detail below.

Education for All: Inclusive education is understood as an Education for All agenda. This understanding entails that every learner, regardless of biopsychological features such as disability, is entitled to education. The Malawian Education Act of 2013 shows that the country considers education a fundamental right. It is stipulated in the Malawi Education Act (2013) that “it shall be the duty of the Minister to ... promote education for all people in Malawi; irrespective of race, ethnicity, gender, religion, disability or any other discriminatory characteristics” (Malawi. Ministry of Justice, 2013, p. 3). Equally, the National Education Policy of 2016 emphasises that the country should strive for “a system of education which responds to a wide range of diversity of learners’ needs mostly arising from exclusion factors such as (but not limited to) disability, race, religion, poverty, psycho-social issues, and other difficult circumstances” (Malawi. Ministry of Education, 2016, p. 8). In the same vein, the National Standards for Teacher Education of 2017 mandates teachers to “make appropriate and flexible use of inclusive approaches to enable children to overcome any barriers to learning they may have” (Malawi. Ministry of Education, 2017, p. 14).

The evidence from the policy documents that inclusive education is understood as an Education for All agenda agrees with participants’ responses during the interviews. In an inclusive education system, “all learners are incorporated in the system of education” (PI2). Again, inclusive education is a “type of education which accommodates all learners regardless of their impairments” (PI4). For this Education for All agenda to be achieved, restructuring of schooling systems is necessary, according to one interview participant:

PI3: Trying to make sure that our schools are restructured, the practices are restructured, even the curriculum is restructured, the environment, everything about the school is restructured to ensure that every learner feels at home or is accommodated irrespective of their diverse needs.

During the workshops, the participants highlighted that inclusive education is based on the Education for All goal. In that regard, some teacher educators “were oriented by Montfort College of Special Needs Education, which told us how to train teachers to handle learners with different disabilities” (PWB). In the same quest, “I can say that here at Phalombe TTC, many lecturers are employing inclusive classroom practices. In some classes, we have pre-service teachers who are disabled, so we learn to teach our students how to handle such learners when they teach in schools” (PWA). However, the efforts towards the Education for All agenda are hampered by a rigid teacher education curriculum, according to PWC: “The curriculum we

use to train teachers is rigid for inclusion. If the problems start from the teacher training process, I do not know how bad the school situation will be”.

Twin-track system: Another key understanding of inclusive education is that this is “a twin-track approach to service delivery” (Malawi. Ministry of Education, 2017, p.11) in education, according to the National Strategy on Inclusive Education of 2017. The twin-track system entails that some learners with special educational needs may be allowed in mainstream schools while others remain in special schools. However, the criteria for this differentiation are not explicit in the policy framework. This situation can lead to unnecessary exclusion as no specific criteria are available for who goes to the mainstream schools and who remains in the special schools.

During the interviews, Participant P11 shared that inclusive education requires “incorporating the learners we are having in the classes in several ways regardless of their disabilities”. However, the policy framework stipulates that based on disabilities, some learners should remain in special schools. During the workshops, one participant shared that “there is a need to establish special needs education centre in the college so that lecturers should have a resource room for helping student teachers who need special assistance” (PWI). This idea contradicts the model the policy framework puts forward on continued exclusion based on disability. The twin-track system has also led to a limited scope of disabilities in teacher education. For example, “as we have seen it here at Phalombe TTC, teacher training mainly focuses on visual impairment and hearing impairment yet in schools there are different disabilities that learners have” (PWD).

The concept of Education for All speaks to an effective system disregarding biopsychosocial factors such as disabilities in providing quality education. However, the twin-track system contradicts the intention towards inclusivity. It must be acknowledged that inclusive education cannot be achieved overnight, but a policy framework that insinuates that exclusion can continue while moving towards a full inclusion system is problematic. Thus, the policy framework, which influences the Person component, needs to be renegotiated towards the inclusivity goal, which would also energise the Process component to bring necessary tools for the mainstreaming agenda. As Bronfenbrenner (2005) inferred, the elements in the Person component should not emasculate the human development of the unit of analysis in the microsystem; instead, it should encourage and support the developmental process of the unit of analysis.

Evidence from different data sources including interviews and workshops show that ESD is understood in various ways by different policy frameworks in Malawi and the teacher educators at the PETTC. I found that ESD is understood as a curriculum for sustainable development and empowering and transforming society through education as discussed below.

Curriculum for sustainable development: According to the Malawi Education Act of 2013, “the national curriculum shall ... develop necessary understanding, values and skills for sustainable development” (Malawi. Ministry of Justice, 2013, p. 30). Interview participants were asked about their understanding of ESD concerning their contexts at the PETTC and in Malawi. The participants’ responses resonate with what the Education Act of 2013 delineated. In connecting the curriculum and sustainable development, one interview participant said:

PI4: My understanding of ESD is that it is the type of education, or it is an intervention whereby it is incorporated into the process of teaching and learning where learners as well as lecturers are being enlightened on the way that they can sustain the environment. As it is incorporated into the process of teaching and learning, it means everybody is taking part in conserving the environment.

Another participant shared that ESD “is one way of making the schools clean. So, we have imparted the knowledge that those papers can be used for cooking after making briquettes” (PI1). Equally, ESD aims to “find out ways and means of sustaining things for our lifestyle, for example, it could be the way we use resources in our environment, and the way we can reduce climate change” (PI2). Thus, ESD was understood as a curriculum supporting sustainable development initiatives.

Empowering and transforming society through education: ESD has also been conceptualised as a quest for empowering and transforming society through education. One response from the interviews highlighted their view of ESD:

PI3: A type of education that is motivated towards empowering educators, whether we are talking about teacher educators or the teachers in secondary schools or even in primary schools. This education is trying to empower them to be responsive to sustainable development issues. So, the curriculum has to be responsive. The teachers themselves have to approach the curriculum in a way that transforms society towards sustainable development.

As one of the conceptualisations of ESD, the issue of empowering and transforming society through education resonates with the intentions of SDG 4, especially Target 4.7. This situation is so because ESD is a praxis arena that is key to effectively attaining the SDGs. As teacher

educators of the 21st century, ESD empowers them with the competencies they need to be effective in their practices. This emphasis is what emerged from the series of workshops at the PETTC.

A curriculum for sustainable development and empowering and transforming society through education are matters of prominence in mainstreaming inclusive education in teacher education via ESD practices. Bronfenbrenner (2005) reminded us that an individual's characteristics define such a person. What an individual experiences and anticipates shapes what they become in a system of practices. Thus, these matters are fore in the Person component of the PPCT model. The understanding that ESD fosters sustainable development and empowers and transforms society via education entails that the unique characteristics that the teacher educators brought to the *Pamtondo* ESD Change Project could actualise the mainstreaming of inclusive education in teacher education through ESD for inclusive pedagogical proficiency.

The study also aimed at exploring the understanding of teacher education in Malawi. The intention was to appreciate how such understanding informs teacher educators' practices. Teacher education was understood as a partnership system and process of professionalism as detailed below.

Partnership system: Teacher education was understood as a partnership system. This understanding entails that different stakeholders are involved in teacher education systems. The National Standards for Teacher Education of 2017 stipulates:

Primary teacher education is delivered through a formal partnership of TTCs and partner schools, supported by a Memorandum of Understanding. Institutes of secondary teacher education also work in partnerships with schools, although these are not formally defined. (Malawi. Ministry of Education, 2017, p. 1)

Teacher education is a common feature of the schooling system across countries. In this particular question, the participants were asked to provide the rationale behind teacher education at the PETTC and in Malawi. It emerged from the teacher educators' responses that teacher education is a training of trainers' model:

PI1: [Malawi] decided to have these teacher training colleges to train the teachers who can also go out there to train the people who are out there in the villages so that whatever they get from the training colleges, they will deliver that message to the people in the communities.

Similar sentiments were made by interview participant PI4 that “whilst they are getting knowledge, later they will assist in imparting that knowledge in private as well as public schools”. This entails that the partnership system is interactive with all the other systems involved.

Process of professionalism: Teacher education was also conceptualised as a process of professionalism. Pre-service teachers “have to go through the process of formal training so that is why we are here to do the formal training so that when the person qualifies, they can teach” (PI2). Equally, “teacher training in this country is there to assist or to impart knowledge to people who are interested in the profession of teaching, so teacher education is there to do that, impart knowledge to people interested in the profession of teaching” (PI4).

The themes of the partnership system and process of professionalism speak to the individualistic characteristics that are apparent in the Person component. Bronfenbrenner (2005) argued that the individual unique features contribute to the human development of the other individuals they interact with in and through differing bioecological systems. Thus, teacher education is a partnership system that brings together synergies for training, i.e. teacher educators, pre-service teachers and the community. Equally, teacher education is a process of professionalism because of the interactions that shape the training trajectory. This situation vindicates Bronfenbrenner’s (2005) claim that the Person and Context components theoretically align to give meaning to the Process component.

5.3.2 PETTC case embraced nested bioecological systems for inclusivity

Several nested schooling systems influence inclusivity. These systems manifest in and operate through the Context component of the PPCT model. The intertwining of the two components influences each other. The thematic analysis of the PETTC data found that it is essential to mainstream inclusive education in teacher education via ESD for several goals, including mainstreaming learners into regular schools, removing cultural barriers, promoting community participation, and influencing change, as presented below.

Mainstreaming learners into regular schools: The issue of mainstreaming learners into regular schools is in essence falling into the microsystem. At the first level, the concern is that the system should allow pre-service teachers with disabilities to enrol for teacher education. This situation is evident at the PETTC, where the college enrolls pre-service teachers with

disabilities. At the second level, the concern is with the support given to such pre-service teachers. Therefore, teacher educators use activities such as the *Pamtondo* ESD Change Project to proffer ways to support diversity within the teacher education system. This framework at the teacher education level builds a model for inclusivity practices at the school level, as this is where the trained teachers go to practise inclusive teaching activities.

A cross-analysis of data sources on the essence of inclusive education in teacher education via ESD indicates a need for mainstreaming learners with special educational needs into regular schools. Policy frameworks, such as the National Education Standards of 2015, mandate that “the school implements all the key features expected of an inclusive and child-friendly school” (Malawi. Ministry of Education, 2015, p. 38). One interview participant also raised the same issue that “learners with diverse needs should be learning together with those learners which perhaps we can wrongly say they are abled learners” (PI5). Another interview participant shared the following:

PI1: I can see a link because inclusive education is there. For inclusive education to be maintained effectively, we need colleges, and these colleges need teachers. I think there is that connection because the colleges will train the teachers on how to include learners with disabilities, so I think there is that link.

During the workshops, participants also believed that there is a need to mainstream learners with special educational needs. In a pair discussion, participants shared:

PWA&B: We need to discuss inclusion in teacher education because there are few special schools for learners with special educational needs. So, only some of these learners can be in special schools. They need to be included with their friends in regular schools.

Another pair discussion concurred with what pair PWA&B above shared:

PWF&H: As lecturers, we think education is a basic right, so every learner needs to be allowed to access education even when they have disabilities, and we see teacher training as the starting point of everything.

Removing cultural barriers: Removing cultural barriers emerged as one of the reasons for promoting inclusive education in teacher education via ESD. Theoretically, this situation speaks to the mesosystem of the Context component in the bioecological model. Bronfenbrenner (2005) defined a mesosystem as “comprises the linkages and processes taking place between two or more settings containing the developing person (e.g., the relations

between home and school, school and workplace)” (p. 80). Cultural barriers that persons with disabilities are meant for segregated and special learning at school have perpetuated exclusion.

Cultural barriers have been a major impediment to inclusive education. To remove these cultural beliefs, the findings suggest that promoting inclusive education in teacher education programmes via ESD is a possible way of doing so. According to the National Education Sector and Implementation Plan of 2020, “the education sector emphasises on inclusive education to ensure that all learners with diverse educational needs are not marginalised and have access to education at all levels” (Malawi. Ministry of Education, 2020, p. 12). One workshop pair of participants discussed the below:

PWE&D: We have to remove cultural beliefs about disability. We can do this by training our teachers about inclusion so that when they go to schools, they should also try to remove cultural beliefs from learners with negative attitudes towards disabilities.

Thus, if the inclusivity practices in teacher education are linked and extended to home settings, it may be easier to remove cultural barriers that prevent potential pre-service teachers with disabilities from enrolling for training and learners with disabilities from being mainstreamed into regular schools. Since a mesosystem is “a system of microsystems” (Bronfenbrenner, 2005, p. 160), teacher educators (a microsystem) worked with pre-service teachers (another microsystem) in ESD initiatives that helped remove some negative cultural attitudes associated with disabilities.

Promoting community participation: At the exosystem level, promoting community participation entails that the community is not directly involved in inclusive education processes in teacher education via ESD, but the funnelling effects pass through and affect it.

In the context of community participation, the essence of inclusive education in teacher education via ESD was evident through interactions between the pre-service teachers in the *Pamtondo* ESD Change Project at the PETTC and community members in the teaching practice schools via the learners. These interactions contributed to improving the *Pamtondo* ESD Change Project. For example, the problem of transitioning from the disability-unfriendly wooden briquetting machine to the disability-friendly metal briquetting machine was solved by community insight, in which they identified and involved a local artisan.

In one of the interviews, one participant made a very thoughtful observation on this theme, and I quote at length to capture the narrative below:

PI5: Previously, these learners with diverse needs, I can cite, for example, visually impaired learners, the deaf society, previously they were locked up in their homes. The parents or the guardians saw these learners as non-educatable. However, now we are trying to sensitise them to say that every learner, every child, can do it, and we have been showing and giving them examples that can you see this one, and can you see this one? That is why today we have to encourage inclusivity, and we can see that special schools in different countries, for example, Malawi, are very few. We cannot just depend on those. We have three, if not four; we cannot depend on those special schools. That is why we have to encourage inclusivity so that each learner in the community having those problems about diversity has to get the education because there are many of them today in society there, they cannot go to special needs schools. Hence, we must encourage inclusivity so that every learner has access to education.

Similarly, some of the workshop participants had the same perception of community participation. In the pair discussions during the workshops, participants discussed the following:

PWJ&I: We know that inclusive education promotes community participation once we start discussing inclusion in teacher education. If learners with disabilities are included in the education system, the same will reflect in their communities, and the teachers we train here at Phalombe TTC have to make that happen.

In agreement, the pair discussion of other participants shared their views:

PWC&P: We all know that disability is not inability. We have seen persons with disabilities being role models in the communities. So, we must encourage our student teachers to see every learner, whether disabled or not, that they are capable of anything.

An exosystem system “encompasses the linkages and processes taking place between two or more settings, at least one of which does *not* ordinarily contain the developing person, but in which events occur that influence processes within the immediate setting that does contain that person” (Bronfenbrenner, 2005, p. 80). The developing person, the teacher educators in the context of this study, was not directly involved in such interactions. However, when the pre-service teachers returned from their teaching practice, they brought new ideas learnt from the temporary protected status communities. Thus, the exosystem – the community – indirectly participated in the *Pamtondo* ESD Change Project, which gives meaning to the interactive nature of the bioecological systems.

Influencing change: Teacher education institutions, projects, policies and curriculum formed the macrosystem for the *Pamtondo* ESD Change Project at the PETTC. Thus, influencing change in inclusive education in teacher education via ESD speaks to the transformative processes at the PETTC, which extend beyond and across the *Pamtondo* ESD Change Project. For example, some teacher educators at the PETTC who did not participate in the SST programme are now also recycling waste into materials for inclusive teaching and learning. Another importance of inclusive education in teacher education programmes via ESD is that there is a spectrum for influencing change across and through schooling systems and communities.

The Malawian Education Act of 2013 states that “any curriculum for teacher training shall take into account the national curriculum and shall be diversified to meet the needs of education for all” (Malawi. Ministry of Justice, 2013, p. 30). This situation entails that the teacher education curriculum must be influenced by and respond to the national curriculum, which is diversified for inclusivity. The same view of influencing change via the curriculum was held by different interview participants, as captured at length below:

PI3: The teacher is at the centre of influencing inclusion in the schools and, of course, in the community. Moreover, when we are talking about sustainable development, the teacher is also at the centre, and you may agree with me that the teachers here come from teacher training colleges or teacher training institutions where we have these teacher educators. Teachers influence change, and we look at the change in education. For example, education systems need to be restructured so that everybody is welcomed, which may culminate in the societies becoming welcoming again. Teacher educator is now at the point where if we are to talk about change in the teacher, who is an agent of change, it must start from the teacher educator.

PI4: TTCs are assisting students in imparting that knowledge to learners. The same thing will be done; they will accommodate everybody regardless of how or where she or he is coming from, whether she has or he has an impairment. Once the TTCs are accommodative and employ the ESD in their TTCs, they will also encourage or take all those with impairments on board to participate in the projects.

PI5: It is important to have this knowledge in our teachers about sustainability, and these teachers also meet these learners who have these diverse needs. Furthermore, suppose these learners with diverse needs have learnt sustainability knowledge. In that case, they can also help themselves in different entrepreneurship skills because they can sell the briquettes, perhaps even indulging themselves in mitigating how the environment can be sustained.

In the macrosystem, the focus is on “particular reference to the developmentally instigative belief systems, resources, hazards, lifestyles, opportunity structures, life course options and patterns of social interchange that are embedded in each of [the bioecological systems]” (Bronfenbrenner, 2005, p. 150). A macrosystem comprises metaphysical and sociocultural factors that shape teacher educators’ inclusivity practices in teacher education via ESD.

5.3.3 PETTC case employed proximal processes for inclusivity

In the formative interventionist research context at the PETTC, the interactions of teacher educators with their practices, peers, policies and institutions formed the core of the Process component. Key to this component in the study is the occurrence of the teaching and learning processes. Thus, the new learning opportunities are proximal processes that enabled the PETTC SST teacher educators to interact and interface with different systems within their context, such as pre-service teachers. The new learning niches of sharing ideas and collaborative learning acted as co-engagement processes, and the teacher educators found this development relevant because of its resonance with the curriculum.

As such, the study was interested in new learning opportunities from the *Pamtondo* ESD Change Project, and the following themes emerged from the thematic analysis of the PETTC data: using locally available resources for teaching and learning, producing teaching and learning aids from waste, sharing ideas and interactions, resonating with the curriculum, and collaborative learning. These themes are discussed in detail below.

Using locally available resources for teaching and learning: One of the key learning opportunities from the *Pamtondo* ESD Change Project at the PETTC was using locally available resources for teaching and learning. In one of the workshops, a participant stated:

PWA: The *Pamtondo* ESD Change Project uses locally available resources. I think we can apply the same to issues of inclusive education because the story that I have heard in schools is about the lack of resources to help learners with disabilities, but we have never thought about what local resources we can use to come up with materials that can support these learners with disabilities.

Producing teaching and learning aids from waste: Another emerging learning opportunity was the production of teaching and learning resources for inclusivity from waste. This was shared in the interviews:

PI1: The skill of using papers I did not have in the first place. I was thinking of using maize leaves or rice husks just because those things were what we were taught when we were in the colleges to say we can use the leaves. However, here, with the knowledge that we got from the student teachers, because this idea came from our student teachers, we can also use the papers to make teaching and learning aids. So, I have learnt a lot from them. Even the way they were mixing these things, I have learnt that it is very good.

PI4: I have gained the skill of how to make the briquettes, and I also heard that we may use, can also use leaves, grass even rice husks we can use them to make briquettes. So, with this knowledge, I can also take it to other people.

PI5: I have learnt from the project a lot. When the project started, it could not quite scale up to the community. Today, we are talking about the whole of Malawi. The students here come from different corners of Malawi, and we have seen photos from Chitipa, Chikwawa, and student teachers cooking using the briquettes, meaning that it has scaled up everywhere in Malawi. We also have some teachers in their homes who use these briquettes in cooking or heating and make materials for teaching.

The issue of producing teaching and learning materials for inclusivity from waste was also discussed in the workshops. A workshop participant said:

PWC: At first, I did not know that we could produce teaching and learning aids for inclusive teaching from waste. Now I know this, and I am also training my student teachers to do the same, which I expect them to repeat when they go to teaching.

Sharing ideas and interactions: The *Pamtondo* ESD Change Project at the PETTC also brought an opportunity to share ideas and interactions through involvement in the project activities. An interview participant believed that “it is very important that everyone is involved. Because if everyone is involved then will also put some effort to make the project work” (PI2). Another interesting thing was noted:

PWE: Learners [pre-service teachers] share ideas and interact in the *Pamtondo* project. They help each other doing the project activities. Even those with disabilities are involved in sharing ideas and doing the activities.

Resonating with the curriculum: The *Pamtondo* ESD Change Project at the PETTC involved the aspect of inclusivity in its activities. In the interviews, one participant ascertained that “it is really important to consider inclusiveness everywhere in Malawi as a country at large because through inclusiveness, nobody is going to be left behind, everybody will be taken on board in whatever as a country we are doing” (PI4). In the same line of thought:

PWG: The project speaks to the curriculum. I can see even the linkage of subjects through this project. Some subjects from arts are linked with subjects from science and come with solutions to our problems like cutting down trees for cooking.

Collaborative learning: The participants were asked about what they had learnt from their macro environment, such as the SST course and their *Pamtondo* ESD Change Project. The participants shared that they have learnt about collaborative learning:

PI2: I have learnt that no one can work in isolation, and you will still require human resources to support you. Not only human resources, you will also require some advice that you can get from others to make sure that your project is sustained.

PI4: I also could take the message to other people because, at first, I did not know that papers could be used to make those things, but now I know how I can make the briquettes.

PWI: In teaching practice schools, students initiate it with their learners and reach the community. The project done at the college is a powerful tool for promoting education that is reflective of the needs of society.

The nexus between the Person and the Context components results in the Process component in the PPCT model. The Process component, which involves “the fused and dynamic relation of the individual and the context” (Bronfenbrenner, 2005, p. xv) influences the teaching and learning processes. Bronfenbrenner (2005) called these proximal processes “primary engines of development” (p. 6). In the Process component of the bioecological model, emphasis is on the interaction between an individual (Person component) and the immediate environment (Context component). Bronfenbrenner (2005) indicated that the Process component:

[e]ncompasses particular forms of interaction between organism and environment, called proximal processes, that operate over time and are posited as the primary mechanisms producing human development. However, the power of such processes to influence development is presumed, and shown, to vary substantially as a function of the characteristics of the developing Person, of the immediate and more remote environmental Contexts, and the Time periods, in which the proximal processes take place. (p. xv)

5.3.4 PETTC case used the achieved capabilities for inclusivity

Bronfenbrenner’s bioecological theory of human development can, via the PPCT model, explain the understanding of inclusive education, ESD and teacher education in a southern African context through the Person component. The theory can also explain the essence of the mainstreaming agenda via the Context component of the model. Again, the theory can explain

the new learning opportunities from the participants' activities in the *Pamtondo* ESD Change Project at the PETTC through the Process component. However, the theory falls short in further explaining how such new learning opportunities have resulted in learning for the teacher educators in the context of the SST programme. Thus, Vygotsky's concept of ADL offers such an explanation.

Understanding what teacher educators learnt from the *Pamtondo* ESD Change Project is crucial for strengthening inclusive education in teacher education via ESD. After identifying the schooling systems recognised for inclusivity in teacher education through ESD, the study focused on how the systems could constrain the mainstreaming of inclusive education in teacher education through ESD practices. In this regard, the following themes emerged from the thematic analysis of the PETTC data: incapacitation due to physical disability; areas and structure of teacher education curriculum; teacher training institute for inclusive education; accommodating structures and expertise; teaching and learning materials and resources; monitoring of inclusivity practices; funding and fundraising; community mobilisation; entrepreneurial skills; supportive leadership; and knowledge base and area of impact. These themes are detailed below.

Physical disability incapacitation: Legal and policy frameworks are expected to be exemplary in encouraging inclusion regardless of factors such as physical disabilities. However, the Malawi Education Act of 2013 stipulated that “a member of Board other than an ex officio member, shall cease to be a member if he— (e) becomes incapacitated by reason of physical ... disability” (Malawi. Ministry of Justice, 2013, p. 34). Thus, physical disability is used as a discriminating factor exemplified by the law. This situation sets a bad precedent for practice in mainstreaming inclusive education, as learners with physical disabilities may be rejected from mainstream practices and processes.

Areas and structure of teacher education curriculum: Another area that needs strengthening for teacher educators to mainstream inclusive education in teacher education programmes via ESD is the approach to structuring the curriculum for teacher education. The Malawi Education Act of 2013 mandated that “the areas of study and the structure of the teacher training curriculum shall be as prescribed by the Minister” (Malawi. Ministry of Justice, 2013, p. 31). Thus, the Minister must legally prescribe what is delivered in teacher education. This approach may be problematic as it is not an interactive one. In one of the interviews, a participant believed that mainstreaming inclusive education in the curriculum should be a top priority. The

participant said, “It is putting that into the curriculum so that the curriculum should be precedence so that it must be part and parcel of the curriculum” (PI2). Another interview participant shared their thoughts:

PI2: It can be done through revisiting the curriculum, where we have gaps that we can slot in as a part of the course so that as implementers are using the curriculum, they can also engage in the same ESD area.

As far as the interview participants were concerned, restructuring the teacher education curriculum was one sure way of mainstreaming inclusive education. P13 highlighted the following:

PI3: As I have already said, the teacher education system must be restructured. We can begin with the curriculum itself. In the curriculum, in my experience, some issues relate to sustainable development and, of course, to inclusive education. For example, our foundation studies curriculum has issues related to inclusive education. Let us talk about environmental sustainability. The social and environmental sciences have issues and topics directly connected to environmental sustainability. But you will notice that the approach with which the teachers and even the teacher educators approach these issues is not helpful.

Other thoughts were that there is a need to add more areas in the teacher education curriculum to incorporate the contemporary issues confronting the education systems. Participant PI4 shared that “there is need for curriculum developers to add or to put more information about ESD in their curriculum so that it is widely evolved that it should involve all walks of people”. However, the dilemma is that the Minister might not prescribe inclusive education or sustainability as part of the teacher education curriculum. In one of the observations (PO1), I observed system constraints that could discourage inclusive education in teacher education via ESD. I was also interested in observing the institution’s system constraints that could discourage inclusive teacher education programmes and projects through ESD. These focused observations led to a conclusion about the inflexibility of the teacher education framework. Like all other teacher training colleges in Malawi, the PETTC draws its training and governance framework from the government machinery. There is no flexibility for localised systems that could better fit into the context of the college with its catchment area.

Teacher training institute of inclusive education: There is a call that Malawi should have a special teacher training institute for inclusive education. According to the National Education Sector and Investment Plan of 2020, “there [is] no government owned institution that train teachers for inclusive education leading to inadequate specialized teachers to support inclusion

in schools” – therefore, there is a need to “establish Teacher Training Institute of Inclusive Education” (Malawi. Ministry of Education, 2020, pp. 30, 49). However, in the context of inclusive education, this call for special teacher training institutions may be very problematic. Inclusive education is about transforming existing systems and structures towards inclusivity and not setting up new ones that would return to the same problem of exclusion.

Accommodating structures and expertise: For inclusive education to be mainstreamed in teacher education practices via ESD, there is a need to strengthen the availability of accommodating structures and expertise. One interview participant shared the below:

PI1: Schools should have structures that are well accommodating. For example, we have pre-service teachers who are failing to move and need wheelchairs. Those teachers need flat forms whereby they can use.

There is also a call for expert support for inclusive education in teacher education through ESD practices. Such support could be in the form of connecting with experts in some interventions, as suggested below:

PI2: We need advice where they can say, this is what you do, but how can you do it better? What if we improve it in this particular direction, for example, improvement of the briquettes, improvement of the equipment that we use?

PI3: I don't know if maybe there may be a chance to assist in imparting knowledge on how best can we go about with ESD not only briquetting but other mechanisms we can apply in order to get the best from ESD.

Teaching and learning resources: There is a call that “the government should at least uplift that area of providing the rightful teaching and learning materials for these learners” (PI1). P15 emphasised this matter:

PI5: We should have enough specialist teachers who understand well learners with diverse needs, and we deploy these teachers in different institutions so that they can help those teachers who perhaps need help understanding learners with diverse needs. I also think that non-governmental organisations and even the government itself have to be sensitised on supporting, perhaps with equipment or materials so that, for example, some gadgets which will help each learner to understand well.

During the workshops, the issue of teaching and learning materials and resources became prominent, as captured below:

PWA&B: Financial support to scale it up. Need for more materials, e.g., moulds and tools. Need for grinders, and lack of transport for community outreach to some areas.

PWJ&I: Time factor: students sometimes struggle to spare time for *Pamtondo* activities. Instead, they prefer to study to prepare themselves for examinations. Resources: sometimes resources may be wasted, destroyed or become scarce; hence, *Pamtondo* activities are affected. Expertise to produce technologies or machines for pressing the briquettes may be lacking.

PWC&P: Limited to few resources such as paper. The machine made for making briquettes could be more effective and efficient for other things.

Monitoring of inclusivity practices: Monitoring needs strengthening for mainstreaming inclusive education in teacher education via ESD. Some interview participants said:

PI1: There must also be monitoring of what has been covered or taught to reach the masses. Otherwise, you must monitor before concluding that things are going on well. You have to go there to find the evidence.

PI2: Another challenge is to monitor the project because if we rely on the college trips, it will not work. After all, the college programs are tight and not loose in the way we want. They are done at times. It means they can be there when we have already passed time to evaluate our project or see what is going on and even encourage those implementing the project on the ground.

The same sentiments were raised during the workshops that monitoring the project is very important and needs to be strengthened:

PWG: Monitoring is very important in each project, so we will ensure that we keep monitoring projects that we start at the college. Through monitoring, we can see whether the project objectives are being met.

PWF&H: The project needs to be monitored time and again to check if the stakeholders are really implementing it.

Funding and fundraising: Financial resources are crucial in mainstreaming inclusive education in teacher education practices via ESD. One interview participant observed the following:

PI1: The materials that we use when pounding those things need money. So, people can say that we do not have money, so we cannot go on with this project because we lack the resources like

mortars. There is also lack of materials that we could use in preparing briquettes. As you can see, we improvised. We used the timbers we came up with to prepare the briquettes.

Concurring with the above thought, another interview participant said, “Financial support is needed because we are saying we want to reach more on ESD with this surrounding community” (PI4). To mitigate the funding challenges, participants suggested fundraising initiatives. For example, “I will be hunting or lobbying for some funds so that I should have some resources needed for that project” (PI1). Another interview participant suggested the following:

PI5: If there are problems, we can organise some dances or big walks to have some money to buy other things which can help. I can encourage different people so that we can get money so that we can continue with our project.

Community mobilisation: The participants in the study were engaged because they were involved in the SST programme. Consequently, they were asked about the support they could render in encouraging inclusive education in teacher education using ESD programmes such as the SST course. Community mobilisation came out as one of the themes:

PI2: It is the very same community that sends learners to primary schools. They have to know who is to go to primary school. There is an element of discrimination. For example, if it is looking at the physical aspects of the challenge that a learner can have so if the community is oriented on who is to go to school, then there will be no discrimination to say this particular child cannot go to school but this one can go to school.

Another interview participant agreed that there is a need for increased awareness of inclusive education in the communities, however, the problem goes back to the funding challenges and the solution lies in the fundraising proposal, as captured below:

PI4: Now, how to reach this community? We need funds to get there, how are we going to travel, whilst we are there what are we going to give, a little thing to the people who are coming to meet us, to see us or to hear what we have brought to them so we need support mainly in the financial part.

Entrepreneurial skills: There is also a need to strengthen the entrepreneurial skills aspect that is part of the efforts towards inclusive education in teacher education practices via ESD. Some suggestions were made in the interviews and workshops:

PI1: If we involve our learners [pre-service teachers] to participate fully in this project of *Pamtondo* ESD, these learners can gain the skills that can help them to have some earnings in the future.

PWE: Making briquettes to substitute charcoal burning or deforestation and cleaning the environment by using waste papers for briquetting and equipping learners with disabilities skills to earn a living by selling the briquettes.

PWF: Mobilising student teachers to model alternatives to the energy crisis, providing alternative sources of energy to the communities and providing briquetting skills to learners, which can help them when they are out of school.

PWJ: It is quickly accepted/adopted by different education stakeholders, i.e., learners, teachers and parents. It is also helping stakeholders to spend time profitably by making briquettes, hence conserving the environment or fighting climate change.

Supportive leadership: Leadership is crucial in mainstreaming inclusive education in teacher education programmes through ESD. There is a need for supportive leadership for the mainstreaming agenda. For instance, one of the interview participants, who had a leadership position in the college, stated:

PI2: My role is to see that we have enough capacity to sustain the project in terms of human resources, financial resources and whatever resources we need in case of transport so that we can reach further.

Knowledge base and area of impact: The participants were tasked, as pairs, to list areas they thought were facing challenges or still needed to be achieved in their SST Change Project. In the pairs, they used game cards to write their responses. The analysis of the pair card game responses, among others, led to the following suggestion:

PWE&D: Knowledge gap of participating schools because the ideas are with students only – this is the same with some of the lecturers. The knowledge to explore other litters for the project in the community. Limited area of impact – not all schools participated. It is operational only when schools are in session – during the holiday, it stops.

The discussion turned to what had to be done to address the challenges in their SST Change Project focusing on disability inclusion. The discussion proceeded with an individual question, and one workshop participant responded:

PWP: We need to diversify sources of concern for ESD. Before this project, we thought that issues of ESD were just about the environment. We just learnt that ESD can bring together different issues to find solutions.

Towards the end of Workshop 2 a roundtable discussion was employed. Three participants volunteered to come to the front for a specific discussion on how they would use the given support to strengthen their teacher education programmes beyond the SST Change Project. One panellist said:

PWA: We need to upscale the Change Project. This project started here at Phalombe Teachers Training College, but we do not want it to end here when SST ends. We want to help surrounding communities, our catchment schools and even other teacher training institutions in Malawi to design ESD Change Projects with inclusive education elements.

In this study, the Vygotskian concept of ‘child’s mental functions’ entails teacher educators’ cognitive intuitions in the *Pamtondo* ESD Change Project. Given that the teacher educators achieved a certain understanding of inclusivity, they challenged the policy frameworks that prescribed exclusion based on disabilities. The teacher educators emphasised that all learners should be educated together regardless of their differing abilities. Similarly, they challenged the Minister’s idea to prescribe the areas and structure of the teacher education curriculum. This situation shows that the *Pamtondo* teacher educators had reached a certain level of understanding (development) that made them want to contribute to the curriculum from their acquired knowledge. Again, teacher educators challenged the idea that the government should establish a special training institute for inclusive education. They achieved a concrete understanding that inclusive education is not about setting up new systems and structures but transforming the existing ones towards inclusivity.

In demonstrating their achieved capabilities (the ADL), the teacher educators applied that knowledge to come up with teaching and learning resources. They also suggested parameters for monitoring inclusivity practices. Some even suggested funding and fundraising models. Those who had leadership positions also expressed a need for supportive leadership. There was also an expressed need to expand the teacher educators’ knowledge base and area of impact from the *Pamtondo* ESD Change Project. Aligned with Vygotsky (1978), the teacher educators achieved all these understandings and capabilities because they were supported through the formative interventionist research process. If this support was not rendered, chances were that they would implement the policy framework situations without critical thought.

5.3.5 Potential capabilities spearheaded agency for inclusivity in PETTC case

Appreciating that the achieved capabilities of the teacher educators in mainstreaming inclusive education in teacher education via ESD practices is not adequate is the main concern for bringing in Vygotsky's concept of the ZPD. In the study context, I served as a formative interventionist researcher. Other teacher educators with an advanced understanding of the Change Project, especially those who took the SST online course, acted as more capable peers.

A critical analysis of the schooling systems was undertaken on how participants' learning could be expanded or enhanced for mainstreaming inclusive education in teacher education via ESD was undertaken. Accordingly, the following themes emerged from the thematic analysis of the PETTC: parental involvement; collective evaluation of teaching, networking, coordination and collaboration; curriculum implementation (concrete to abstract pedagogical trajectory, responsive to biopsychosocial factors, learner-centred pedagogy and varied assessment strategies); and ESD framework. These themes are discussed below.

Parental involvement: Parental involvement was identified as one key strategy that could help mainstream inclusive education in teacher education through ESD praxis. Concerning inclusive education, the Malawi Education Act of 2013 stipulated:

In so far as is compatible with the provision of efficient instruction and training and the avoidance of excessive public expenditure, students are to be educated in accordance with the wishes of their parents. (Malawi. Ministry of Justice, 2013, p. 3)

This principle entails that parents need to be involved in the education of their wards. Concerning the *Pamtondo* ESD Change Project, one participant noted this fact:

PWC: [It] has extended to the community. This encourages communities to plant trees on bare grounds. Students are teaching parents to make briquettes and are using them in their communities for cooking.

Collective evaluation of teaching: Another strategy is the collective evaluation of teaching and not targeting individuals. This strategy is stipulated in the National Education Standards of 2015:

The Standards are not designed to be used to judge the work of an individual teacher. That is the role of the Performance Appraisal system. Nor are they to be used to evaluate the delivery of an individual lesson. The Standards instead look at teaching across the school as it is delivered by the body of teachers who comprise the school staff. (Malawi. Ministry of Education, 2015, p. 10)

In one of the interviews, the following was observed:

PI3: If we train teachers in education for sustainable development, we are actually working with the ideal group of personnel that can facilitate the efforts towards sustainable development goals and inclusive education.

PI2: Of course, other areas can do that, but when discussing inclusiveness, it starts with teachers. Other departments can do it, but it starts with teachers.

Networking, coordination and collaboration: According to the National Education Sector Investment Plan 2020-2030, there is a need to “establish networking, coordination and collaboration of players in inclusive education” (Malawi. Ministry of Education, 2020, p. 50). In resonance, the National Strategy on Inclusive Education of 2017 highlighted:

The current management systems and structures at headquarters, division, district and zonal levels need to be strengthened and realigned to inclusive education since services such as planning, procurement, accounting, school inspection and advisory and capacity building of teachers affect the implementation of inclusive education. (Malawi. Ministry of Education, 2017, p. 16)

Since the participants suggested support strategies they could render. They were asked about the effectiveness of those support strategies in raising or encouraging inclusion in teacher education through ESD programmes. One of the interview participants responded as follows:

PI2: We encourage department members to make sure that we do this together so that each one knows what is going on because the project is in the department. We have owned it, so everyone should be part and parcel of the project, so we have oriented each other.

Curriculum implementation: In this study, observations focused on enablers and constraints within the institutional systems and went further to brainstorm how the opportunities could be used and the constraints eased for teacher educators to design and implement effective inclusion-oriented teacher education programmes via ESD. The training and governance framework must be followed since it is the government’s standardised system for all teacher training colleges in Malawi. However, the college could implement the curriculum to respond better to its needs (PO2). For example, the issue of ESD is not explicitly mandated in the teacher training framework; however, the college has found a way to incorporate the same in its teaching and governance structures. Such initiatives need to be augmented and sustained. The observation was also interested in lectures or tutorials to appreciate how the teacher educators imagine or reconstruct the classroom and the schools where the pre-service teachers

would work with learners of diverse biopsychosocial features. In this regard, one participant was selected to have their lecture observed. Below are the key themes from the observed lecture.

Concrete to abstract pedagogical trajectory: Retrieving prior knowledge is what pre-service teachers are supposed to do in the classroom and the teacher educator started with that during the lecture (PO3). The teacher educator did not assume that the pre-service teachers had no prior knowledge of the topic under discussion. She tried first to provoke what the pre-service teachers may already know.

Responsive to biopsychosocial factors: The teacher educator was also sensitive to factors such as gender and disabilities (biopsychosocial features) by ensuring that these categorised groups of learners actively participated in the lecture (PO3). Such responsiveness ensured that all learners' needs were met in tandem with their differing abilities.

Learner-oriented pedagogy: In the same observed lecture, the focus was on pedagogical methodologies that the teacher educator employed during the lecture or tutorial (PO3). I observed that the teacher educator employed learner-oriented methods of pedagogy. There were instances when group work, demonstrations and presentations were used during the lecture. I was interested in observing whether and how the teacher educator's methodologies would enable or constrain inclusive pedagogical proficiency in pre-service teachers. In the observation (PO3), I concluded that peer learning and groups can help learners with disabilities to be assisted by their peers. For example, learners with disabilities such as hearing or visual impairments were helped by their friends to understand the lesson.

Varied assessment strategies: Another focus of the observations (PO3) was assessment. In this regard, I observed that different assessment strategies were used during the lecture (PO3). These included the question-and-answer technique, hot sitting, recap and exercises (PO3). As an extension of the assessment strategies, I was interested in observing how the assessment strategies offered or took away opportunities for inclusive education once the pre-service teachers were teaching in mainstream schools. I observed that the assessment strategies promoted critical learning. The question-and-answer technique allowed pre-service teachers to get clarifications on their understanding.

ESD framework: Having identified new learning opportunities from the *Pamtondo* ESD Change Project, the participants were asked how those opportunities could be maximised within their courses, modules, institutions and country. Individual brainstorming and then oral feedback were employed for discussion. The participants shared in the workshops that as a strategy to mainstream inclusive education in teacher education via ESD praxis, there is a need for the inclusivity practice to be defined within the ESD framework, as captured below:

PWB: We can take advantage of the opportunities we have seen by encouraging college and community structures to involve the ESD framework in their planning and activities.

PWD: The ESD project started on recycling waste paper within the college, but we can explore alternatives to paper that pollute the environment equally.

PWF: We need to be trained on how to improve our ESD project. We started on our own but some of us did not receive any training, so if there is any opportunity, the training can help us improve how we implement the project.

Moving forward, the PETTC SST teacher educators aspire to encourage parental involvement in the mainstreaming agenda. They need support to develop co-engagement tools to translate that aspiration into action. Once they achieve that involvement, they would move to higher-order aspirations such as collective teaching evaluation and strengthen their networking, coordination and collaboration spheres. The ZPD was evident during the lecture observation, where the teacher educator demonstrated pedagogical proficiencies that would encourage inclusivity, such as the concrete to abstract lecture flow and the learner-centred pedagogy. Thus, with its sustainability principles, the ESD framework emerged as a viable context for working with the participants' ZPD. Therefore, as described in the formative intervention process, we worked together and supported each other to build on what the teacher educators already achieved – the ADL – to move via the ZPD to expand their capabilities' learning. Such expanded learning provided strategies for mainstreaming inclusive education in teacher education using ESD.

5.3.6 Time dimensions can track the actualisation of inclusivity in the PETTC case

In this study, the Time component (or the Chronosystem) can monitor and evaluate inclusive education in teacher education practice in the ESD context to determine the actualisation of the mainstreaming process and the potential of inclusive pedagogical proficiency. In one of the observations (PO1), I aimed to look at systems in terms of the institution's policies and

resources that presented possible ways for inclusive teacher education programmes and projects. The college management is well-organised regarding teacher education systems and is aware of national policies, strategies and guidelines that shape teacher education in Malawi; however, monitoring and evaluation are very problematic (PO1). The first part of the interviews strongly indicated that it is necessary to encourage inclusivity in the participants' practices. As such, the participants were asked about the ways they could monitor and evaluate whether their teacher education programmes include and promote inclusive education concerns over time. It was discussed during the workshops that monitoring and evaluation ensure sustainability and encourage improvement, as captured below:

PWC&P: It is very important to monitor our programmes for inclusive education because monitoring ensures sustainability. If we do the monitoring, we will know what is going well and what is not and take steps to move forward.

PWE&D: If we monitor and evaluate, we can find ways to improve the project because we will know our weaknesses.

PWJ&I: Monitoring and evaluation present opportunities to identify problems and suggest solutions.

Using individual questioning, pair discussion and poster presentation, the participants debated the ways and relevance of monitoring and evaluating whether their teacher education programmes in the ESD context prepared pre-service teachers to be competent in inclusive education. In this regard, teacher educators proposed how inclusivity could be tracked, including through teaching practice, database forums, research, discussion forums, teaching strategies, assessment, and curriculum evaluation, as presented below.

Teaching practice: Teaching practice was identified as one key way to monitor and evaluate inclusive education towards fulfilling the mainstreaming agenda. This situation recognises that the teacher education praxis mainstreams inclusivity for the benefit of the schooling systems while embracing and using sustainability principles. Some participants shared the below:

PI1: As a college, we have put some measures to say that we train our students they go to teaching practice schools, and when they are there, they should also train the learners and also the community on how to do these things. So, if we want to have a follow up, we can go to the schools, find out from the learners themselves, and say, are you doing these things?

PI2: When we go for teaching practice, remember we said we go for teaching practice, so when we go for teaching practice, we also monitor what the students are doing.

PWF&H: When these student teachers have spent some time in the college, they go for teaching practice in schools, so we, as lecturers, can visit those schools and see if the teachers are encouraging issues of inclusive education.

Database forums: Another suggestion for monitoring and evaluating inclusive education in teacher education in the ESD context is through a database forum as shared below:

PI4: If they are from farthest areas, we may ask them to capture something of what they are doing there and send us through the media.

PI2: Apart from that, we have created a forum where we allow the pre-service teachers that whatever they have done, even briquettes, they should be taking pictures. Moreover, they take pictures and post them on the forum; we see almost every school doing that.

Research: Research has also been identified as crucial for monitoring inclusivity in teacher education practices in the ESD context, as suggested below:

PI4: When we have enough funds, we may call them and see exactly what they are doing after they are out of this college.

PI5: Do research, and that research has to be evaluated again. We also need to research to find out if the project is in progress and being done or if the people are doing the things that they are supposed to be done through interviews, a questionnaire you give people to respond to or observing or visiting the areas where you have introduced or have set the activities. You have to visit the areas or send questionnaires or do interviews to monitor and evaluate.

Discussion forums: The participants are assumed to have immediate systems that they influence or have influence on them. In this regard, the participants were asked about strategies they could employ to encourage their immediate systems, such as their pre-service teachers, to promote inclusive education when they teach in schools with learners with disabilities and other biopsychosocial characteristics. Discussion forums emerged as the central theme from this question, and below are some of the responses:

PI1: I can have some conversations with them so that at least they should know. They should be aware of the usefulness of using those things.

PI3: Discuss with them about inclusive education when meeting as a community of practice to increase their awareness.

PI4: For us to be meeting may be easier. We should form a club for lecturers only or lecturers and students so that we may discuss issues of ESD and inclusive education in that club.

Teaching strategies: Teaching strategies were also identified as key in monitoring the mainstreaming of inclusive education in teacher education practices in the ESD context. For example:

PI2: We also have topics, for example, in foundation education studies, that talk about inclusive education. We do that, and we teach them. Above all, we have a special program where we orient students on inclusive education. For example, we have teaching practice hours, Tuesdays and Thursdays, so we spare some of the weeks, Thursdays in particular weeks, to orient students on inclusive education, prepare handouts, give every lecture, go in the classrooms and orient students on inclusive education.

PI5: By inviting my fellow teacher educators to receive lessons on inclusive education and even visiting their classes to monitor if they have embedded what I am telling them about inclusive education, are they implementing it in their lessons? Because we have different lessons, for example, we have different lesson plans for regular classes and lesson plans for an inclusive class. Hence, in a class which has inclusive learners or learners who are diverse are there so the lesson plans are different, so I have to help these teachers impart the knowledge on how they can write these lesson plans or how they can deliver a lesson in an inclusive education class, which means that if they can deliver am sure that the student teachers can emulate.

Assessment: Participants identified assessment as one sure way to monitor and evaluate inclusive education in teacher education via ESD. For example:

PWA&B: We can assess the students. There comes a time in the academic calendar when our student teachers are assessed through examinations and teaching practice. So, we can know through their performance in the assessment if they are encouraging inclusive education. What we have to do as lecturers is to put questions or tasks that will achieve this goal of knowing whether the programmes are encouraging inclusive education.

Curriculum evaluation: At the beginning of Workshop 3, the participants were asked about ways to know how their teacher education programmes were encouraging inclusive education among pre-service teachers. A pair discussion and oral presentation were used during this discussion and curriculum evaluation was identified as a way:

PWE&D: We also need to evaluate curriculum implementation and see if the programmes include inclusive education because what we train the student teachers comes from the curriculum. However, we must evaluate it after some time to see many issues, such as inclusive education.

PWJ&I: Nowadays, the curriculum has changed to a critical thinking method. So, we also need to take a critical thinking approach to seeing whether our curriculum encourages inclusive education issues in our student teachers.

Time dimensions are necessarily determinant elements of human development in bioecological systems. Bronfenbrenner (2005) defined such dimensions in the Context component as the Chronosystem. This system “permits one to identify the impact of prior life events and experiences, singly or sequentially, on subsequent development” (p. 83). In the Chronosystem, three tracking strategies can be deduced: cross-sectional, short-term longitudinal, and long-term longitudinal designs (Bronfenbrenner, 2005). For this study, the short-term and the long-term longitudinal designs resonated well. In the first instance, the tracking should focus on life transitions. This situation would be achieved through the teaching practice, database and discussion forums. In other words, this kind of tracking would focus on the immediate concerns of the current teacher educators and pre-service teachers in the *Pamtondo* Change Project. However, a more life course tracking process could help sustain the *Pamtondo* Change Project initiatives. Therefore, through research, teaching strategies, assessment and curriculum evaluation the extent of time could be interrogated in actualising the mainstreaming of inclusive education in teacher education via ESD practices. The *Pamtondo* Change Project can be summarised in Bronfenbrenner’s theoretical framework as shown in Figure 5.7 below.

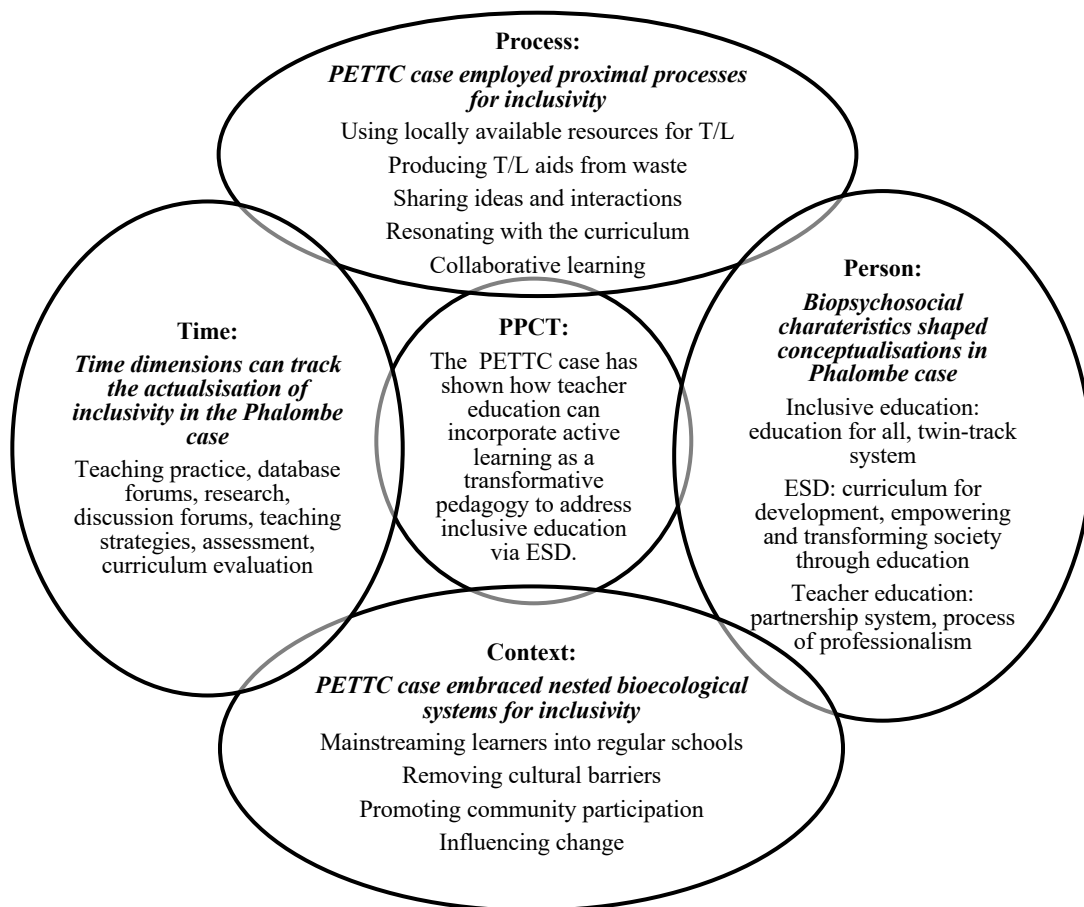


Figure 5.7: Bronfenbrennerian summary of the PETTC case

The PETTC Change Project can also be summarised using the Vygotskian framework as shown in Figure 5.8 below.

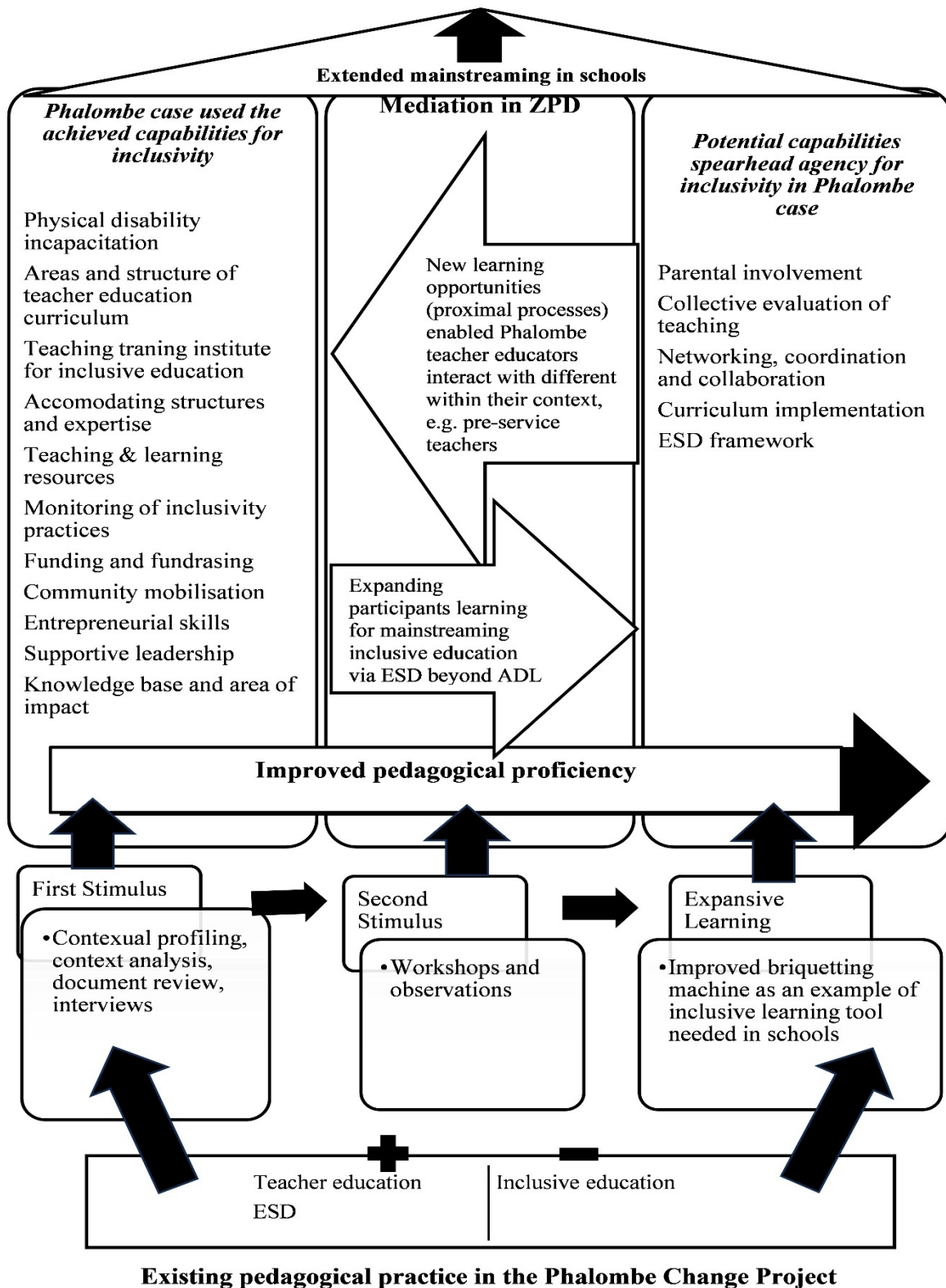


Figure 5.8: Vygotskian summary of PETTC case

5.4 Conclusion

This fifth chapter was a case analysis of Malawi. In Malawi, I originally worked with three teacher education institutions involved in the SST programme: PETTC, Karonga and St Joseph. These three cases focused on inclusivity in their teacher education practices via the SST ESD Change Projects. For the sake of the deep focus of the study, I chose one institution where the full research process happened. Thus, this chapter reported the research processes and findings from the PETTC and the analysis that emerged from co-engaging with the participants via various data generation methods.

The PETTC *Pamtondo* ESD Change Project participants (the SST teacher educators) indicated ways of monitoring and evaluating inclusive education in teacher education in the context of ESD, which can be seen as ending at the ZPD level in a Vygotskian theoretical and analytical sense. Still, more is needed than saying we can track inclusivity via research or teaching practice. To borrow Vygotsky's words, there are other things that an individual cannot achieve outright, even with support from adults or more capable peers. Thus, as much as I offered support to the PETTC SST community of practice, it did not mean they expanded their learning to the level where they could do without support. What is their ZPD presently may become their ADL in the future? Therefore, we must acknowledge that as much as good learning supersedes development, it has limitations.

In this study, there is a lack of indicators for monitoring inclusive education in and through teacher education in the Malawian context. This situation exists, according to the United Nations Educational, Scientific and Cultural Organisation's (UNESCO) (2020) PEER Profiles on inclusive education. The PETTC *Pamtondo* ESD Change Project participants could not reach this level (of developing monitoring and evaluation indicators) through expansive learning even with my support as a formative interventionist researcher. I, therefore, used what the participants suggested to guide monitoring and evaluation to proffer indicators for monitoring and evaluating inclusive education in teacher education in the context of ESD (see Chapter 8). Thus, the participants' ZPD became my ADL, and I built on that to expand my learning as a researcher. The next chapter analyses and presents the research findings from the Tanzania case study.

CHAPTER 6

SUPPORTING SUSTAINABILITY IN ESD TEACHER EDUCATION: TANZANIA

6.1 Introduction

This sixth chapter presents a case analysis of Tanzania on mainstreaming inclusive education in teacher education via ESD. The initial scope in Tanzania involved three teacher training institutions in the SST programme: Dar es Salaam University College of Education (DUCE), Mtumba and Mhonda. The DUCE case focused on strengthening inclusivity in teacher education via sustainable Information and Communication Technology (ICT) for pre-service teachers with disabilities. The Mtumba case involved work around inclusive and special needs education courses in early and primary education so that it helps pre-service teachers with special educational needs to integrate issues of Education for Sustainable Development (ESD). The Mhonda case focused on recycling waste into teaching and learning materials for inclusive and sociocultural learning. Out of the three institutions, I selected DUCE as the case for focus and analysis because this case was more established in terms of Change Project activities at the time the research commenced. The other two cases delayed the start of their Change Projects due to institutional challenges. In tandem with formative intervention, the DUCE case was more ready for engaging in a formative intervention. Thus, this chapter presents the research process and findings from an ESD Change Project at DUCE in Tanzania.

The DUCE is a constituent college of the University of Dar es Salaam in Tanzania. The college specialises in training teachers for preschool, primary and secondary school. The college has three faculties: science, education, and humanities and social sciences. While the faculties of science, and humanities and social humanities offer subject content, the faculty of education offers teaching methodology courses. The college also offers different postgraduate programmes within the three faculties. The college has the special education unit that offers specialised services to pre-service teachers with special educational needs. Like many institutions across Tanzania, DUCE was involved in the Sustainability Starts with Teachers (SST) programme. For the SST ESD Change Project, the teacher educators chose to work on supporting pre-service teachers with disabilities. Figure 6.1 below summarises the DUCE research project.

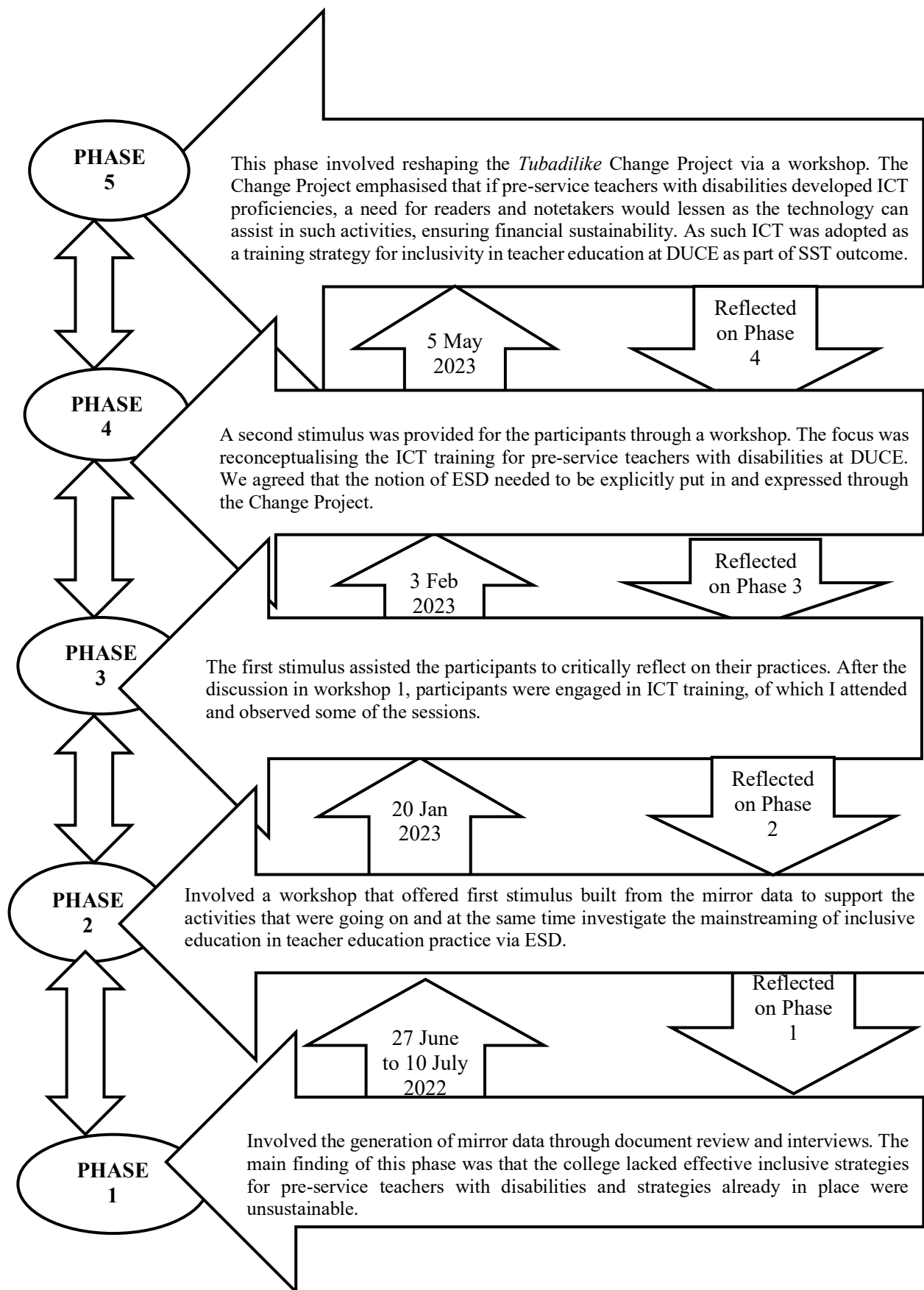


Figure 6.1: Summary of DUCE case research process

6.2 DUCE Change Project and Formative Intervention Process

Just as in Malawi, the institutions in Tanzania were invited to join the SST programme as the third cohort (2021-2022) with Eswatini. In Tanzania, many teacher education and TVET institutions joined the SST programme. One such institution was the DUCE. The SST participants at DUCE participated in a national workshop convened by United Nations Educational Scientific and Cultural Organisation (UNESCO) ROSA. The workshop aimed to introduce the SST programme and give a working framework for the participants and institutions. The DUCE SST team chose to name their ESD Change Project “The use of ICT facilities for learning among students with visual impairment in higher education institutions in Tanzania: Challenges, lessons and possible interventions”. In short, they called the ESD Change Project *Tubadilike*, a Swahili word for ‘Let’s Change’. In Swahili, change is *badilika*, hence *Tubadilike*. The key mission was to change the way pre-service teachers with disabilities access academic information and their mindset towards ICT, as well as teacher educators’ mindset towards pre-service teachers with disabilities and their access to technology.

The *Tubadilike* ESD Change Project focused on transforming learning among pre-service teachers with disabilities at the University of Dar es Salaam from being too dependent to more independent learners through ICT (starting with the DUCE campus) and later on to other higher learning institutions in Tanzania. The project’s ultimate focus was to make ICT learning a continuum of service among pre-service with disabilities in order to transform them into more independent learners. Bronfenbrenner (2005) argued that interactions are very imperative in human development. These interactions do not involve human-to-human situations only. They also involve interactions with the materialist environment. In the case of *Tubadilike* ESD Change Project, I regard ICT as the materialist environment that interacts with pre-service teachers with disabilities. What the DUCE ESD Change Project did was to design a model that may shape the inclusivity landscape in the Tanzanian schools. The pre-service teachers with disabilities in *Tubadilike* ESD Change Project represent the learners with disabilities across mainstream schools in the country. This situation resonates with the theoretical position that interactions with physical, social and cultural environments do not occur unsystematically. These interactions have funnelling impact on the elements in the bioecological systems of human development (Bronfenbrenner, 2005).

6.2.1 Inception design

The *Tubadilike* ESD Change Project at DUCE was inceptioned with an understanding that the institution needs to operate towards sustainable development by meeting present needs in a more advanced way. This would entail not endangering the future generations' opportunity to meet their needs, and without endangering the ecosystem, compromising social, economic and political justice. The *Tubadilike* Change Project was also inceptioned with an understanding that ESD is the key instrument to attain the SDGs. The Change Project recognised the need to change how education is offered and what is imparted to the learners to achieve the SDGs. The *Tubadilike* ESD Change Project was in line with the DUCE's motto, mission and vision, which in its sum is to offer transformative quality education for all and the SDG 4, which is quality education, i.e. "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (UN, 2005).

The *Tubadilike* ESD Change Project inception design speaks well to the theoretical argument that learning and change happen in and through systemic interactions that give meaning to activities (Bronfenbrenner, 2005). In this sense, the macrosystem captures what happened in the *Tubadilike* ESD Change Project. Bronfenbrenner (2005) emphasised that the macrosystem has "a particular reference to the developmentally instigative belief systems, resources, hazards, lifestyles, opportunity structures, life course options, and patterns of social interchange that are embedded in [the other bioecological systems]" (p. 150). The teacher educators in the *Tubadilike* ESD Change Project (Bronfenbrenner would call them a microsystem and this study designates them as the unit of analysis in the form of Person component in the PPCT model) and the pre-service teachers with disabilities (another microsystem in their own right), form a mesosystem through the Change Project interactions.

However, these interactions are not only influenced and shaped by the two microsystems' immediate environments (such as other teacher educators or pre-service teachers without disabilities in DUCE); instead, the interactions are equally and essentially influenced by and funnelled to 'opportunity structures' through 'social interchange' – the macrosystem. This study regards ICT in teacher education as the opportunity structure that adds value and meaning for teacher educators and pre-service teachers with disabilities. Again, this study regards the processes in the *Tubadilike* on ICT as the social interchange that influences the teacher educators' and pre-service teachers' pedagogical proficiencies.

6.2.2 Situational analysis

The *Tubadilike* ESD Change Project team undertook a situational analysis of teacher education at DUCE as an institution in the context of Tanzania. They observed that, at present, pre-service teachers with disabilities at DUCE are too dependent on other people – the readers and notetakers employed by the college. Besides, they largely use the old technology of typewriters. The teacher educators felt a great need to reform the curriculum and the content taught to address these matters of concern. The current way of transferring knowledge, values and attitudes needs to be improved. In the systems of human development (taking teacher education as a developmental process), Bronfenbrenner (2005) argued that interactions with other systems are imperative. Nonetheless, these interactions should not remove an individual's agency to contribute to their development processes. Thus, the situation that the *Tubadilike* team found needed a critical response. Such a response entailed the influence that the teacher educators had on the teacher education systems at DUCE.

The *Tubadilike* ESD Change Project also recognised that there is a need for a long-term learning-led change plan, starting with teacher education. They emphasised that pre-service teachers need to see the relevance of what they learn at school to connect to their real-life context. They concluded that the content they use to teach must include values and attitudes for transformative change. Thus, the immediate possibilities for curriculum enhancement and enrichment should respond to contemporary needs. This quest forms part of proximal processes that pre-service teachers with disabilities and teacher educators encounter in the nature and form of systematic interactions in and across influencing elements of their immediate and far environment (Bronfenbrenner, 2005).

The intention was to motivate pre-service teachers with disabilities to collaborate with teacher educators using problem-solving skills relevant to their context. The *Tubadilike* ESD Change Project also emphasised skills and knowledge on the use of technology, which was a common challenge for both teacher educators and pre-service teachers with disabilities at DUCE. Consequently, the *Tubadilike* Change Project focused on empowering pre-service teachers with disabilities, special needs unit staff and teacher educators to integrate ICT use as one of the learning strategies for mainstreaming inclusive education in teacher education via ESD praxis.

6.2.3 Practical orientations

The situational analysis for the *Tubadilike* ESD Change Project at DUCE revealed that the learning environment and infrastructures, including access to learning materials at the college, are less inclusive for pre-service teachers with disabilities. Thus, the Change Project intended to build capacity for teacher educators to provide an opportunity for pre-service teachers with disabilities to have equal access to quality education through ICT. They planned transformative learning about and through ICT training for pre-service teachers with disabilities. Before starting the actual ICT training with the pre-service teachers at DUCE, they first mobilised their stories. They wanted to understand each pre-service teacher's background, knowledge of ICT, if any, attitude towards ICT learning, and readiness to embark on ICT learning and transform themselves. Then, they did an in-depth inquiry on what pre-service teachers with disabilities wanted to be trained on regarding ICT. They developed a learning programme from the gathered information and used ICT college personnel to train persons with special educational needs. Then, they started the actual training. The training is recurring and targets both teacher educators and pre-service teachers with disabilities.

6.2.4 Before formative intervention

The teacher educators wanted to understand the context of the human development of the pre-service teachers with disabilities. This situation entails that these pre-service teachers are a microsystem surrounded and influenced by physical, social and material features and relations such as their background, knowledge and attitudes. What the *Tubadilike* team did, in Bronfenbrenner's (2005) theoretical sense, was operate in and through the Context component of the PPCT model in which the teacher educators (a microsystem) did not exist independent of other microsystems (in this case the pre-service teachers with disabilities). Thus, what is prominent from this practical orientation of the *Tubadilike* ESD Change Project is the interconnectedness of differing systems for inclusive pedagogical proficiency.

Essentially, "the principle of *interconnectedness* is seen as applying not only within settings but with equal force and consequence to linkages between settings, both those in which the developing person actually participates" Bronfenbrenner (2005, p. 54). The *Tubadilike* ESD Change Project initially assessed pre-service teachers' attitudes and readiness to embark on ICT training for transformative learning. The pre-service teachers were hesitant to learn using ICT since most of them did not receive proper training on ICT learning. Therefore, they

avoided it, fearing that if they dared try it, they would be forced to use it even if they did not have sufficient ICT learning skills. After a good orientation, there was a great change of attitude regarding ICT learning as pre-service teachers with disabilities were positively prepared to embark on ICT training. On this aspect, the *Tubadilike* Change Project checked if the pre-service teachers could apply the knowledge and skills acquired from ICT training to overcome their learning challenges and difficulties. The SST team engaged two ICT specialists from the University of Dar es Salaam's main campus in Mlimani City to join *Tubadilike* at the DUCE campus in Temeke. Both specialists were teacher educators with disabilities (pursuing doctoral studies at the time). They conducted several ICT training sessions for teacher educators and pre-service teachers with disabilities – one session of the ICT training is shown in Figure 6.2 below.



Figure 6.2: ICT training in the *Tubadilike* ESD Change Project at DUCE

6.2.5 During formative intervention

The *Tubadilike* Change Project was conceptualised in teacher education via the ESD context of the SST programme with a focus on inclusive education. In the case of the *Pamtondo* Change Project in Malawi, we saw that the elements of teacher education and ESD were very strong

but the inclusivity component was weak, hence the formative intervention. Now, I had a methodologically similar but epistemologically different situation in the *Tubadilike* ESD Change Project in Tanzania. In this Change Project, the notions of teacher education and inclusive education were more explicit but that of ESD was not yet explicit. The SST programme was meant to build capacity in teacher educators for ESD in teacher education praxis. Therefore, the shortfall in the ESD component necessitated the formative intervention in the *Tubadilike* Change Project at DUCE in Tanzania. The first phase of the research process involved generating mirror data through document review and interviews. Engeström (2011) explained that mirror data is essential in creating the first stimulus and “is used to stimulate involvement, analysis, and collaborative design efforts among the participants” (p. 613).

Following the document review and interviews, the next phase involved a workshop that offered the first stimulus built from the mirror data. Having formatively intervened in the *Tubadilike* ESD Change Project at DUCE, the intention was to support the activities that were going on and at the same time investigate the mainstreaming of inclusive education in teacher education practice via ESD. The first stimulus assisted the participants to critically reflect on their practices. As a researcher, I also had insights from the policy frameworks which enriched the discussions in this phase. Since the first stimulus speaks to the “initial problem situation” (Engeström, 2011, p. 598), the teacher educators needed to develop the capacity to co-engage the pre-service teachers with disabilities in learning about and through ICT.

Thus, after discussions in the workshop, participants were engaged in ICT training as the third phase of the research process. I attended some of the training sessions and made some observations that brought us to the next phase. In the fourth phase of the research process, a second stimulus was provided for the participants. As Engeström (2011) said, the second stimulus is a mediating conceptual tool that empowers participants to realise contradictions from their practices. Thus, during the workshop in the fourth phase, the focus was reconceptualising the ICT training for pre-service teachers with disabilities at DUCE. Figure 6.3 below shows one of the sessions for reshaping and refocusing the *Tubadilike* ESD Change Project.



Figure 6.3: Session on reshaping and refocusing the *Tubadilike* Change Project

In reshaping the *Tubadilike* Change Project, we agreed that the notion of ESD needed to be explicit in and through the Change Project as that was the underpinning framework for the SST programme. We identified two areas in which issues of ESD became apparent: (1) the use of readers and notetakers and (2) excessive paper and electronic materials. In the first area, we observed that the college employs a reader or notetaker for each pre-service teacher with a disability. Such a person would be there to read notes, attend lectures with the pre-service teacher to take notes and provide other services required by the pre-service teacher. Therefore, if the college enrolls 100 pre-service teachers with disabilities, the financial implication is that the college is obligated to employ 100 readers and notetakers. We concluded that this situation would be less financially sustainable for the college. Thus, we worked on this area through financial sustainability as part of the ESD framework. In the second case, the materials used by pre-service teachers with disabilities turn into waste stored in college rooms. Our inspection found tons of braille papers and electronics, such as Perkins typewriters. Recycling this waste into teaching and learning materials would be necessary. Therefore, the *Tubadilike* Change Project emphasised that if pre-service teachers developed ICT proficiencies, the need for readers and notetakers would lessen as the technology could assist in doing such activities, ensuring financial sustainability. The Change Project also had the same view on the waste from paper and electronics used by pre-service teachers with disabilities.

6.2.6 After formative intervention

As part of the intervention in the *Tubadilike* ESD Change Project, we agreed on vertical scaling where teacher educators and pre-service teachers with disabilities need an ICT training course concentrated on special educational needs to be part of professional development (for teacher educators) and curriculum (for pre-service teachers with disabilities). The *Tubadilike* team agreed that, in their first year at the university, pre-service teachers with disabilities would learn how to learn using ICT (this provision was previously available for pre-service teachers without disabilities only). The following year, they would become well-equipped and more independent learners within the DUCE teacher education context. All this would involve government and institutional decisions as it requires policy change. We also agreed on horizontal scaling of the project by replicating the *Tubadilike* ESD Change Project to other University of Dar es Salaam campuses, later to other universities, and eventually to inclusive schools across Tanzania beyond the SST programme.

Bronfenbrenner (2005) might say that what we agreed in the *Tubadilike* ESD Change Project is not a verification mode, whereby we wanted to verify if what we did at DUCE could apply in other settings. Instead, we intended a discovery mode by “providing scientific bases for the design of effective social policies and programs that can counteract newly emerging developmentally disruptive influences” (Bronfenbrenner, 2005, p. 4). Here, our “effective social policies and programs” are the ICT training for inclusivity in the *Tubadilike* ESD Change Project at DUCE and “newly emerging developmentally disruptive influences” are the unsustainable financial model and poor waste management at the campus.

6.2.7 Key outcomes

The *Tubadilike* ESD Change Project at DUCE is ongoing, but its value is already evident. Through this ESD Change Project, teacher educators and pre-service teachers with disabilities are learning about ICT and how to use it in their training, potentially a critical skill in teacher education for inclusivity and sustainability. The teacher educators and pre-service teachers with disabilities are potential resources who could train others in ICT learning. This situation creates a complex of systematic interactions necessary in influencing and mainstreaming inclusivity in and through teacher education via ESD activities manifested and understood through Bronfenbrenner’s (2005) bioecological systems of human development. For example, the Process and Context components of the *Tubadilike* ESD Change Project at DUCE are

synergising to change disability learning behaviour, possibly transforming the schooling systems towards inclusivity.

6.3 DUCE Research Findings and Analysis

This section progresses the analysis and presentation of DUCE findings to an abductive level. Essentially, the section explores the emergent themes from the thematic analysis of document analysis, interviews, observations and workshops done with the teacher educators at DUCE by applying the study's theoretical framework: Bronfenbrenner's (2005) bioecological theory of human development and Vygotsky's (1978) sociocultural theory of learning. As noted earlier, among the three notions: inclusive education, ESD and teacher education, ESD needed more attention and support in the *Tubadilike* Change Project. Thus, the abductive analysis hones into the formative intervention in strengthening the Change Project's ESD component. Nonetheless, inclusivity remains the unit of analysis for the study, and it was equally supported alongside teacher education. In some instances, I quote participants' responses at length to give a vivid picture and depth of the thoughts shared through our interactions.

6.3.1 Biopsychosocial characteristics framed conceptualisations in the DUCE case

In a bioecological system understanding, conceptualisations are part of the personal features that Bronfenbrenner (2005) designated as imperative for human development. The DUCE research data analysis found that the conceptualisation of inclusive education centres on equal opportunities, inclusive needs and teaching approaches. The analysis further found that the conceptualisation of ESD centres on education for survival and adapting to changes, education for responsible living and use of resources, and sustainable development in teaching and learning. In teacher education, conceptualisation takes the form of a training trainers' model, developing teaching skills, and preparing a mentorship torch, which are core elements in the Person components of providing inclusive teacher education programmes. The following themes emerged from the understanding of inclusive education from the DUCE research and policy documents' review.

Equal opportunities: The country's National Strategy for Inclusive Education (2021–2026) defined inclusive education as:

A system of education in which all learners are enrolled, actively participate and achieve in regular educational settings and other educational programmes regardless of their diverse backgrounds and abilities, without discrimination, through minimisation of barriers and

maximisation of resources. The inclusive education approach therefore involves transformation of policies, legislations, regulations, processes, structures, infrastructure, practices and human resources to support accommodation of all learners to learn together wherever possible, regardless of any difficulties or differences they may have. (Tanzania. Ministry of Education, Science and Technology, 2021, p. 3)

This definition entails that inclusive education is understood as providing equal opportunities to disadvantaged learners at all levels of education in Tanzania. In concurring with this policy definition, some of the interview participants shared the following:

DI1: The general understanding of inclusion is an idea where we try to push on, trying to bring in all the disadvantaged people to the same level as all the people who are not disadvantaged in any way. So, we are looking at disadvantaged groups and specifically what is commonly seen as people with disabilities or who need special attention, maybe with a deviation from the normal, then all these individuals.

DI2: At the country level, we are very much interested. One of the areas which have been given much attention is to help support learners with special needs, whether with disabilities who are handicapped in whatever way so that they can learn in a similar modal whereby others can learn. Of course, there are some extremes whereby some of the people with disabilities could be put in a continuum of service whereby those who are in the extreme are put in a separate environment, which is a special context for them. However, when there is a possibility of including the government, the country will put in much effort to champion that one because that one is seen as very important because they help them also to adopt them to struggle to try to help them to be doing like the others.

DI3: Inclusive education includes all people regardless of their diversity, and when we say diversity here, we mean many things: Gender, disability, race, colour, nationality, yes, so without any discrimination.

DI4: And of course, my college sits like one of those universities who is trying to do inclusion that while we have several starting with those with visual disabilities, we have the physical ones, we have the deaf, we have the partial hearing, we have the partial visual, all of them we are trying to put. Moreover, of course, as we have learnt from our unit, we have about 68 now whom we are working with and the context of the university to support them. So, the university needs to set a specific unit so that that one could be dealt with in a very special way, but the unit is there to support inclusion because these individuals are participating in different regular classes. Therefore, some people are assisting staff who are trying to ensure they provide support so these individuals can adapt to normal. That is what we can say in general terms.

Inclusive needs: Inclusive education is also understood as education that meets the needs of all learners regardless of any obstacles they face in the learning environment. The country's Education and Training Policy of 2014 emphasised that education is a universal right that every

child in Tanzania should access. This emphasis is reiterated in the country's National Strategy for Inclusive Education which stipulates that the

[a]doption and actualisation of the inclusive education approach inevitably requires nothing short of education reform underlined by the transformation of policies, legislations, regulations, processes, structures, infrastructure, practices and human resources to support accommodation of all learners to learn together wherever possible, regardless of any difficulties or differences they may have. (Tanzania. Ministry of Education, Science and Technology, 2021, p. 47)

In the same vein, one interview participant stated:

DI2: Inclusive education is the kind of education that meets the needs of every student despite their disabilities or special needs so that when the education system is structured should meet their needs. From buildings to the way education is offered. So, the way the buildings are structured, they should be friendly to all students. The way the education itself is offered should meet the needs of all students.

Teaching approach: Another emerging understanding of inclusive education is that it is a teaching approach. Essentially, “for learners with disabilities to access and full participate in inclusive educational settings they may need support services, adapted curriculum, adapted teaching and learning methods and materials, assistive devices and in some cases personal assistance” (Tanzania. Ministry of Education, Science and Technology, 2021, p. 22). This observation suggests that in inclusive education settings, teaching approaches are reconsidered towards inclusivity, as one interview participant shared:

DI4: Inclusive education is an approach to teaching where learners with and without disabilities are brought together under the same roof to learn and participate fully in the act of learning whereby there is an adapted curriculum, adapted learning materials, disability specialist personnel, accessible infrastructure, assistive technology and adapted teaching methods to ensure that each learner participates fully and reaches his or her goal.

The understanding of ESD varied from one teacher educator to another. Below are some of the themes that emerged from the understanding of ESD in the Tanzanian context.

Education for survival and adapt to changes: ESD has been understood as education for survival and adapting to changes in living systems. One interview participant said:

DI1: It is that kind of education which will keep an individual going regardless of different changes because we know that we are living today, but there is tomorrow. It is a kind of education which will help an individual to survive in different contexts, in different changes which happen in our globe. Therefore, it is a kind of education which provides flexibility, whereby an individual

can still cope and adapt to what changes come ahead in the global or the community. That is what I can say about the kind of education that is said to be sustainable.

Education for responsible living and use of resources: Another understanding is that ESD is a kind of education for responsible living and the use of resources, as captured below:

DI2: An education in the way that students are knowledgeable on how to exploit resources and to live by not risking the needs of the first generation. So, our education should include the knowledge that the way that the student lives in the college, outside the college, the way they use resources, and the way they exploit resources does not risk the needs of the next generation. Education should include those aspects, and that will be education for sustainability.

DI4: The question of education for sustainable development is the education that enables an individual to manage his life at present and in the future as an individual and to the surrounding community.

Sustainable development in teaching and learning: An analysis of the data shows that ESD is also understood as putting sustainable development in the context of teaching and learning, as shared below:

DI3: Education for Sustainable Development means putting sustainable development in the context of teaching and learning. I mean putting all sustainable development issues in the context of teaching and learning, so, for example, if you try to solve these emerging social problems like poverty, disaster issues like earthquakes, and hunger, now you try to solve those problems in the context of preserving these natural resources for tomorrow. I mean, when you try to solve problems or when you try to bring or to enhance development, do it or enhance it considering the future, yes, consider the next or the future generation, yes, for example, try to preserve what we call afforestation, yes, try to preserve natural resources like minerals, do not destroy them. So, consider these natural resources.

The study was also interested in deducing the rationale of teacher education programmes at DUCE as an institution and in Tanzania as a country as part of the schooling system. The country's Education and Training Policy of 2014 indicated that tailored teacher education is needed to improve the quality of Tanzania's education. The following are the themes that emerged on the understanding of teacher education in Tanzania.

Training of trainers' model: Teacher education has been understood as a training of trainers' model. In this understanding, teacher educators train teachers who, in return, train learners in schools. Below are some of the thoughts that the participants shared:

DI1: As an institution, we train teachers so that we feed our schools so that because we have our individuals, our students, pupils are learning they need some experts who can impart knowledge

and in that way now we established the teacher training colleges and university, and many universities in Tanzania now they have some teacher component because some years ago we had a teacher shortage, so we pushed to have this kind of programme, teacher training so that we have individuals who can help us to teach in our schools and of course to help in directing the country in terms of what is relevant in terms of learning and of course which I think is a global focus. We have teacher training to prepare teachers to feed our schools, which are here, of course, with all the learning needs regarding materials and policy and things.

DI3: We need to transfer the knowledge to the next generation and to be able to transfer the knowledge, we train them in different aspects. We need specialised people, and these people need to be trained to transfer those knowledge and skills, hence the teacher education. We want to train people who can successfully transfer their knowledge and skills to the next generation.

Developing teaching skills: Another understanding that emerged on teacher education is on the development of teaching skills, as quoted below:

DI3: We normally train them so that they can have, they can have teaching skills, teaching skills to help students in other in other levels. I mean teachers, prospective teachers must have some skills, some educational skills, which will help them develop or teach. I mean students in other education levels like primary, secondary and all that.

Preparing a mentorship torch: Teacher education is also understood as preparing a torch for mentorship, as captured below:

DI4: As you know, a teacher is like a torch, is the one who shows direction, and so we prepare teachers so that they mentor the workforce to run different sectors in the country. A teacher is the hub for sustainable development, so he/she needs proper preparation so that every sector in the economy, politics, science, in engineering can be managed well and produce the required results.

The research question on conceptualisations aimed to cultivate an understanding of inclusive education, ESD and teacher education in Tanzania. Establishing this comprehension was important for pinpointing the biopsychosocial traits that inform ESD and influence support for inclusivity in teacher education. The study situated these insights and biopsychosocial traits within the Person component of Bronfenbrenner's Process-Person-Context-Time (PPCT) model, which encompasses the specific aspects of an individual's developmental features. Within the scope of this study, the Person component involved the practices, experiences and personal beliefs of teacher educators regarding issues of inclusivity and ESD. Therefore, it was crucial to grasp the concepts of inclusive education, ESD and teacher education through participants' input via the *Tubadilike* Change Project and analysis of policy documents.

How these concepts of inclusive education, ESD and teacher education are defined, directly impacts the approach and support provided for biopsychological characteristics affecting inclusivity in teacher education in the ESD context. Thus, if pre-service teachers with disabilities' inclusive needs are accommodated within the teacher education settings, they would develop inclusive teaching approaches relevant to Tanzania's schooling systems. The bioecological model does not regard the Person component as an individual only. Instead, it is a system on its own with influencing attributes. Thus, the *Tubadilike* teacher educators' understanding that ESD centres on survival and adaptative skills in a responsible educational setting will help them provide the necessary support for inclusivity in and through teacher education while engaged in sustainability activities.

6.3.2 DUCE case employed nested bioecological systems for sustainability

Multiple interconnected educational systems and structures impact ESD as it relates to mainstreaming inclusivity in and via teacher education, operating within the Context element of the PPCT model. Apart from the understandings of the three notions: inclusive education, ESD and teacher education, the thematic analysis revealed the importance of a teacher as a driver of knowledge on sustainable development, inclusive education fostering sustainable development, the power to change other people, balancing disability support and independent living, and supporting the inclusivity cause. These themes are presented in detail below.

The teacher as a driver of knowledge on sustainable development: According to the data analysis, teachers should be designated as the drivers of knowledge on sustainable development. This knowledge is mainly advanced from schooling systems with teacher education as the conduit. Below are some of the participants' thoughts on this theme:

DI1: If I can start with the elements of development, we are training teachers so that they can then be a driver of the knowledge which is going to our society. If that is the case, if we want to help society to keep going, to be relevant in terms of competency, in terms of skills, then we have some individuals who should be trained with the kind of knowledge which is sustainable, which will keep them going, proceed and of course remain relevant. This will help the community remain relevant in terms of all the changes which come around. So, teacher training is important to adapt this kind of education, which we say is sustainable because they are drivers, the ones who can help to sustain the society.

DI2: They are very much related because teachers' education should also include aspects of sustainable development because we are training them to go and train the others, learners, so they also need to be equipped with the knowledge of sustainable development to be able to transfer that knowledge. On inclusive education, they are not going to teach students with similar needs

but different needs, so they need to know how they can include all those learners. So, they are very much related.

DI3: Teacher training should embrace ESD and inclusive education. It should be part and parcel of this programme when it teaches or when its curriculum involves things like research and all that. Yes, it should teach teachers or prospective teachers ESD issues and inclusive education issues, so when teachers impart knowledge to prospective students, they should also make them aware of these three things.

DI4: Given the fact that the society has different segments of members, I may relate the three components by saying that the person whom we prepare as a teacher has to acquire knowledge and skills as well as attitude and values that direct him or her to value every member in the community and transmit knowledge and skills to him which will lead to; proper economy, proper politics, proper science for the nation to stand and ensure that it is sustained.

Inclusive education fosters sustainable development: The analysis shows that inclusive education fosters sustainable development. The evidence from the research indicates that when education is offered in inclusive settings, learners develop and foster collective agency for sustainability. Such an endeavour starts from the teacher education systems, as captured below:

DI1: With inclusion now, I see it as a relevant element because we have individuals who need special attention in our society. If society is moving and some people are not moving with society, that may signify an element of less sustainability because you are not being inclusive enough. Inclusion now becomes an important component in sustainability because sustainability is also about addressing almost everything. It may not be completely all, but almost all the important needs.

DI2: Because it is very much related to the sustainable development goals. If we have to achieve the sustainable development goals, we must include that aspect. It is under education: access to quality education for everyone. So, if we leave behind the people with special needs, then we have left a group behind. For us to achieve the 2030 sustainable education goals, that is important.

DI4: With the change in technology and global development, we are more likely to be relevant because everybody is participating, and with the flexibility of the learning context today, we see that teachers are very important in dealing with inclusivity. So, I see these connecting with sustainability because we need a kind of flexible, relevant knowledge to be introduced, and if we are to put teachers into that kind of learning, then we will ensure that the knowledge which is going to the society is ensuring sustainability. Inclusion is coming in, therefore, as one of the elements which justify the merging of these two elements.

The power to change other people: The relationship between inclusive education, ESD and teacher education is seen in its power to change other people. When inclusive education is

encouraged in teacher education in the ESD context, there are chances of effecting change that the society desires. According to the National Strategy for Inclusive Education:

The ultimate beneficiary of inclusive education however, is the society because inclusive education is a mainstay of an inclusive society. Some of the most outstanding social rewards of inclusive education is that it foster[s] understanding, acceptance, collaboration and tolerance, and generate openness towards others, and towards their characteristics and diversity. It is however important to highlight that successful inclusive education, does not happen only in educational settings, but rather its bedrock is communities where inclusion is a societal norm. It is therefore essential that inclusive education is promoted and implemented with the emphasis on society adjusting to the person and removing obstacles in the environment, attitudes, services, rather than disabilities or difficulties in the development of the child, by providing quality and continuous support at all levels with the aim of achieving educational outcomes and individual potentials. (Tanzania, Ministry of Education, Science and Technology, 2021, p. 4)

The observation above was also reiterated during the workshops conducted with the participants at DUCE. According to some conversations we had, one participant said:

DWC: We appreciate you for the [research] project. It has changed us; it has given us the power to change other people, so we want to bring change, especially with our Change Project. We want to see changes in people with special needs, and we want to see changes in the way we are. The university handles their course, so our life has been impacted, and we have a good vocabulary. We are really eager to impact other people's lives, so we appreciate the whole [SST] programme organisers.

Balancing disability support and independent living: The essence of inclusive education in teacher education in ESD context is also recognised in the pursuit of balancing disability support and independent living, as shared below:

DWB: Secondly, for you to balance students' disabilities and independent living and scaffolding for sure, let us say that it needs to be taken care of because it has been the tendency of students with disabilities not to live an independent life. They are too dependent. I have stayed here for almost 15 years. I may say that only one or two students with visual impairment can go alone. However, the majority of them can't unless they are with a certain guy, so it means orientation and mobility are lacking. However, self-confidence in mobility among the students is also lacking, so there is a need because they are here temporarily, but they are going out there to the world session and community life for the rest of their lives, so it is very important to do this.

Supporting the need for inclusivity: Participants were asked why it is worth their time, the institution's resources and the country's priority to offer teacher education programmes that encourage inclusive education via ESD. The intention was to surface the importance or relevance of inclusive education in teacher education in the context of DUCE as an institution

and Tanzania as a country. Supporting the inclusivity cause came out explicitly and prominently in answers to this question, as noted in the quotes below:

DI1: We see the importance of making sure that our education system is inclusive enough, and we have this project which ensures that kind of sustainability, and some people are supporting at least in terms of guidelines, materials, how to do it, then I find it very important like to help because there is that real problem in the field and I find myself like a person at the exposal of it whom I have the capacity, I can do that kind of change.

DI2: We see the importance because this is a problem, and it is less studied, lesser focused with whether the government or the NGO here in Tanzania, so that was the motivation that it is important is the reason that gives us the energy to do with this kind of projects; inclusivity, sustainable development because it is an area which is like a forgotten one or even if there are some attentions, I do not see much attention. It is new, but there is much need. Together with this project, last year I dreamed of another project similar to this one, which, in short terms, I call IBE [inclusive basic education], inclusive, identification of inclusion in education systems. From very early years, we wanted to identify some individuals who are coming to inclusive settings with some needs which are not well addressed, and then this one was like trying to top up because this one was coming to address, to support, but we wanted to document to what extent individuals around can be included. There are some people out there. If there is an attempt to include them, they can survive from the early years.

DI3: Inclusive education should be encouraged. You know the world is diverse, you see, the world is diverse for that matter, everything should be inclusive, including education. Nowadays, you can hear things like inclusive economy, inclusive employment, so every sphere of life now includes inclusivity. We are now in the sphere of education we have to include it so that this education should reach all people regardless of their diversity; that is why we should include that. I mean, nobody should miss education because of his or her disability.

DI4: In the first place, it is the right of every individual to get access to equal and equitable education. Quality access to equitable quality education is their right as stipulated by international conventions, national laws, policies, programmes and strategies, and this is very important for the nation's sustainability. Thus, by providing inclusive development training for teacher preparation for inclusive education, we are valuing every citizen of the nation.

Bronfenbrenner (2005) contended that the Context component significantly shapes an individual's development. The nested bioecological systems, including the microsystem, mesosystem, exosystem and macrosystem, influence the Person element – specifically, the biopsychosocial traits of an individual. Thus, the Context element interacts with and relates to the Person element. This connection between the individual and their surroundings is not merely additive but interactive, as stated by Bronfenbrenner (2005). The interplay between these two elements mutually influences each other, and these influences could be seen in the relevance of inclusive education in teacher education via ESD as presented above.

During the formative intervention in the *Tubadilike* Change Project, we needed to find a balance between providing disability support and fostering independent living for pre-service teachers with disabilities to ensure sustainability. Thus, we formed different mesosystems that interacted within and across the Change Project praxis to shape the mainstreaming of inclusive education in teacher education via ESD at DUCE. The macrosystem, which “may be thought of as a societal blueprint for a particular culture or subculture” (Bronfenbrenner, 2005, p. 81), in which we operated as a community of practice, helped us move towards the equilibrium between disability support and the idea of independent living for such individuals. We held meetings involving what we refer to as readers and notetakers, which was the exosystem of the Change Project. During these meetings, we discussed the concept of scaffolding, wherein assistance is provided where necessary and withdrawn when it is not required. This approach aimed to facilitate independent living for individuals with potential, despite their disabilities. We encouraged the support of this independence by identifying opportunities for scaffolding within the Change Project and across the institution.

The Context component of the PPCT model argues that the systems and structures in an individual’s environment could enable or constrain their development. In the context of this study, teacher educators looked at the sustainability principles that could give meaning to the aspiration for inclusive education in teacher education through the SST Change Project. Thus, due to their guidance and training (which can be thought of as activities and structures in the Context component but across bioecological nested systems), teacher educators supported pre-service teachers with disabilities to acquire skills to perform certain tasks independently. For instance, incorporating ICT reduced the physical support required from readers and notetakers, fostering a sense of achievement among them and promoting self-esteem by proving that they can accomplish tasks on their own. This situation can be said to be what Bronfenbrenner (2005) called development process, which is a “phenomenon of continuity and change in the biopsychological characteristics of human beings both as individuals and as groups” (p. 3).

6.3.3 Proximal processes supported sustainability in the DUCE case

The interaction between the Person and the Context elements in the PPCT model generates the Process component. In this study, the outcomes of such an interaction manifested in the new learning opportunities for the participants. These new learning opportunities are proximal processes (Bronfenbrenner, 2005) that enable teacher educators to enhance the human development of pre-service teachers with disabilities. In this regard, the thematic analysis

found the following new learning opportunities: thinking big – starting small; persons with disabilities can live an independent life if supported; improved perspectives on disabilities; incorporating sustainability in teacher education; ESD can be included in every sphere of life; collaboration, indigenous knowledge and past innovations; and experiential learning. These themes are elaborated below.

Thinking big, starting small: As a value from the SST programme in general and the *Tubadilike* ESD Change Project in particular, participants learnt that change manifests in thinking big but starting small, as captured below:

DII: I started working with the inclusion process and, of course, coming up with the concept of ESD. In the beginning, when I started the project, it was like a trial, more like an idea. My passion was to try the idea. Of course, I do several things especially in terms of projects, and not all of them. I start with a certainty that I know it will work. Sometimes, I believe that it can work, but I am not sure, so at times, with this project, I realised that there are things I could not believe could work.

DWA: I had many ideas with less determination to put them into practice, and that is what I see coming from this project as one of the unique lessons that I was learning the material on change, the culture of a Change Project then it gave me the skill on how if you want to do a very good Change Project there are some factors which we learnt from the lesson and then it gave me a lot of, like kind of skill on to characterise which issues should I put if I want to bring in a kind of a very tangible relevant project in the community.

DWB: I think previously we thought to have a kind of very good project of impact to the community you need to have, to put much of time looking for funding trying to ask for support before even putting this particular project even in a smaller context, ours was a kind of a project which if I want to put down what the funder, how might be used, it's really on what, on support with very negligible less funding, but with very bigger impact, there are a lot of people with twenty million or ten, there actually were some project which have less tangible product than what we, we gained in our own project, the bigger thing which I am learning from this lesson, now if I have an idea I start the project I don't look for funds first, I have to do it even in a single class or to some four people then from this perspective I make it as a base even if when I go for a discussion for sharing some people can see some tangible products and where then you can also get some support. So, I have this kind of confidence now that I should not just have my idea in my pocket and, of course, see that it is not possible to do it without the funding. I learnt to start with the meagre time or very meagre resources to start something in a very feasible context, even if it is small; that is the bigger thing from the project we did.

Persons with disabilities can live an independent life if supported: Some participants shared that through the *Tubadilike* ESD Change Project, they have learnt that persons with disabilities

can live an independent and sustainable life if properly supported through systems such as teacher education via ESD praxis, as captured below:

DI1: I have learnt that individuals with disabilities or individuals with some exceptionalities, when included, can be independent to a bigger degree, which I could not expect it really, they could be independent.

DWC: Through the project, we have been able to change the attitude of the students toward technology, so they are now more accepting of the technology, the facilitator did a very good what was that, attitude change session when we started the project, and it was excellent. The students had changed their attitude towards technology, and they were ready to go for it. It is like we have started a fire, and we are even considering convincing the university to do so because now we have Information Technology teachers. However, they are not specialised for special needs students, so the moment we can put this into a curriculum, we will also be able to convince the university to employ specialised people for students with special needs.

Improved perspectives on disabilities: The *Tubadilike* ESD Change Project has also improved teacher educators' and the community of practice members' perspectives on disabilities, as shared below:

DI1: I learnt a very big improvement in perceptions for those individuals; when they are included, they instantly forget that they have a disability. They need to remember. Like I have been helping these friends, and we have worked together with these children and staff because, of course, we also have some staff with disabilities. They could, if I give one example with visual impairment, we go to several places, and they tell us to let us go and see this person. For me, it was very strange. What does this guy mean? I learnt when I was with them that seeing is not my eyes only. For them, hearing a voice is seeing, touching is seeing, so I learnt from them, and of course, I find them being educated, so I learnt. I became educated. I pretend to be an expert trying to know, trying to help and then within, I became educated that these people feel completely different; they become confident they can even educate us on several other things.

Incorporating sustainability in teacher education: Some teacher educators had a dilemma about how issues of ESD could be incorporated into their courses. One such focus was linguistics, in which, before the Change Project, the teacher educator did not know how to do this, as captured below:

DI2: I have learnt a lot. As for me, how would I include sustainability as a linguistics teacher educator? I teach languages. However, I have learnt that it is possible. Like the illustrations, the examples, and the materials I am using for teaching, they should be based on sustainable development issues. If I am teaching language, if I am teaching comprehension, I can use a passage explaining sustainable development. So, at the same time, students are learning comprehension skills, the same time, they are grasping knowledge about sustainable

development. So that is something I have learnt: how do I include that aspect? Now, I know how to include it in my teaching.

ESD can be included in every sphere of life: The *Tubadilike* Change Project also taught teacher educators that ESD can be included in every sphere of life:

DI3: ESD can be included in every sphere of life. It is not something which may be contained in a certain container, I mean in a certain sphere, which is called ESD; it must be included in every sphere of life when discussing politics. Politics include issues of ESD there, when you talk about curriculum, when you talk, everything about, I mean, about life because it includes almost all spheres of life, including even conserving these natural resources.

Collaboration, indigenous knowledge and past innovations: Through the *Tubadilike* ESD Change Project, teacher educators learnt about working with the community, Indigenous knowledge and past innovations, as shared below:

DI4: I have learnt from the SST programme that we need to work with the community, Indigenous community and everybody else who is around us, and we need to remember the old knowledge because all is gone. However, we also need to combine the previous and today's science for a better future in our project. We came to learn that the majority of lecturers and other administrative and technical staff are unaware of the inclusive pedagogy in the whole process of teaching and learning very few of them can embrace inclusive education, and so we still have a job to do to enlighten them, to ensure that we all reach the same point and be able to serve each learner in our classes.

Experiential learning: Has also come out as of value from the *Tubadilike* ESD Change Project, as reported below:

DWA: For me is to thank you the SST team for the support and, of course, in terms of skills, and that one really, we appreciate and count on you that this one will be a very useful opportunity, especially in giving us ideas on how to do things differently, things which we were doing before but in a way where sometimes you do not see something tangible but now through this programme we can, of course, get interested in ourselves, you are doing yourself and then you find yourself getting the passion because you are to do something which you also did not expect. So, it is very important, it is very motivating.

DWB: Secondly, is the change of teaching style, from largely theoretical now to largely practical where students, teacher trainees are really engaged to the real world and so learning is happening in the natural setting and then when it is acquired it remains, it becomes to the long-term memory because they are doing, they are learning it by doing so the Change Project has emphasised the teaching style to be more practical.

DWC: Because of this project and another project which I have, of course, I have projects apart from this one, through this idea, I was also trying to help teachers change everything which they

are teaching in class to go out of the class to try to start something which if, for an example, I took some teachers teaching soil erosion then we discuss whether we can go around the school and have a programme in the class to try to prevent something like erosion which is coming because of school which also teachers soon were very interested apart from just learning from the theory. This one will be, it is motivating, first of all, for everyone with whom you share, and then it was a result of the project.

The new learning opportunities presented above represent the intertwined relationship between an individual and their environment (Bronfenbrenner, 2005), shaping ESD processes and inclusivity in teacher education. Bronfenbrenner (2005) defined these interactions as *proximal processes*, emphasising their role as the primary catalysts for development. In the research context of formative intervention at the DUCE, the core of the Process component was shaped by how teacher educators engaged with their practices, peers, policies and institutions. Central to this focus was exploring sustainability processes, particularly discovering new learning opportunities within the *Tubadilike* Change Project. Bronfenbrenner (2005) observed that “not only do some of the processes turn to be quite convoluted – involving feedback mechanism, sequential stages, and alternative paths of direct and indirect influence” (p. 69). Contextually, our work on sustainability mechanisms in the *Tubadilike* ESD Change Project ensured that we could observe the absence of the concept of sustainability because DUCE, as a college, could not sustain the practice it had initiated. It was an admirable endeavour, yet the sustainability mechanisms were missing. As co-participants in the research process, we knew what we had experienced regarding the readers and notetakers system.

Thus, we used every available opportunity within the Change Project environment to advocate integrating ICT features into the curriculum. This endeavour speaks to the PPCT model, especially the idea of Process, which “is subject to *interactive moderating effects* of both person and context” (Bronfenbrenner, 2005, p. 78, original emphasis). If ICT for disability support elements were integrated into the curriculum, we believed the problem would be reframed. This situation would ensure the change’s continuity even after participants’ retirement or departure, hence essential for sustainability. Therefore, we argued that achieving inclusion required a focus on sustainability. We challenged the process of initiating things merely to showcase efforts towards pre-service teachers with disabilities (and by extension, learners in schools), lacking the genuine passion to integrate these efforts into their lives as part of their regular training (and learning) experiences.

6.3.4 DUCE case used the achieved capabilities to enhance sustainability

Understanding what teacher educators learnt from the *Tubadilike* ESD Change Project was essential in invigorating ESD as a context for investigating the mainstreaming of inclusive education in teacher education. In this regard, the study looked at areas needing strengthening so that *Tubadilike* teacher educators could mainstream inclusive education in teacher education programmes via ESD. Accordingly, teacher educators were asked about issues arising in their Change Project they found challenging. The thematic analysis of the research data showed that strengthening inclusive education in teacher education via ESD would relate to financing for sustainability; mindset changes towards non-profit projects, cooperation and collaboration, ICT gadgets and software, and ICT-phobia and learning. These themes are presented in detail below.

Financing for sustainability: One of the most challenging areas in the *Tubadilike* ESD Change Project is financing. To strengthen inclusive education in teacher education via ESD, there is a need for a sustainable financial model for the initiative, as shared below:

DI1: When we started our project, we started in the first lecture because I had the first lecture. We started with a discussion before we started the assignment, the online lecture that we were talking about. We had much discussion on the sustainability when you do a project in the aspect of sustainability. A small amount of an element of financing is also sustainability. Suppose you do not calibrate where you become. In that case, your projects become more expensive, they become less friendly in terms of how you manage, and if it is too expensive, of course, you know the setup of this project is like a personal initiative. You are trying to institutionalise, which I think for us like happened with the coincidence that we are pushing something which the university had also received much support with 48 laptops for people with visual impairment, and then we went on benefitting.

DI4: The challenge which is still there is the question of funding. Funding is the key resource for making, for ensuring that each and everything is done. Moreover, availability, but when we have funds, we can also get the assistive technology software and hardware if the majority of the management team is positive to ensure the project works.

DWA: We are trying very well there. What I might add is the attitude change with the community, of course, the people also who are responsible for supporting the programme by funding, by facilitation, the possibility of people in management and leadership to support this programme, but I think there is low consideration, which they sometimes see the need, they are not putting it at the core. However, this is a management issue, and there is also a need to change. They like it when they see the result, but they are slow to put resources into support to make sure that at least the individual is supported; bring some experts to facilitate the activities.

Mindset changes towards non-profit projects: Another feature that needs to be strengthened to mainstream inclusive education in teacher education via ESD is a mindset change among stakeholders towards non-profit initiatives. Some participants shared the following:

DI1: When we started this project, we were many. There were more than ten interested people. We had two projects but were forced to leave out the other project and move with this one and remain with only three because everyone could not believe that people were meeting. It seems like you are just forcing your interest, then you might have some money from somewhere, then you want to benefit yourself, then why should we come there and join you? And then, for me, that is mindset.

DI2: The people who are heading the [special needs] unit, even the learners themselves, when we started calling them that can we do this, sometimes we are struggling in that when we have very big fund support from somewhere and wherever they meet, they do not believe if our motivation is coming from ourselves, not any funding also all of the meetings we are forced to use some money from our salary, just not because of the training even the meeting because everyone believes that for you to come here and lose some half day it is not possible, you may be getting some money somewhere.

Cooperation and collaboration: Lack of cooperation was also cited as one of the areas that need strengthening for the mainstreaming agenda, as captured below:

DI1: Because of mindset, we miss cooperation from the people here because I am not a head in the special unit; some people are like, every day we work with these people, whatever. Because they believe it is something we explained, but when they sit, they think that no, that cannot be possible. Then, they still keep it; they take what we say and keep it. A large part of the knowledge they keep is that these people can help, but they are not. So, whenever we try to move on, there is less. So even if we try to improve the cooperation, we have to use something to motivate them. Nevertheless, for us, you understand that we are pushing from no other source, but this is the situation on the ground. So, mindset, the cooperation of which mindset has affected the cooperation.

ICT gadgets and software: Another area that needs strengthening in the *Tubadilike* ESD Change Project at DUCE is the provision of ICT gadgets and the latest computer software, as discussed by some of the participants:

DI3: ICT is challenging because when you want to make a Change Project on ICT first you have to have these ICT gadgets, because without ICT gadgets even the project cannot be doable. Now as you know a challenge of having those gadgets needs money sometimes it needs capital to have them, and also maybe you can say okay let me now to go to borrow those ICT gadgets in a certain institution, I mean if you go borrowing them, they can give you conditions.

DI4: On the computers, maybe they have installed an old operating system, and if you convince them to install the current operating system, say Windows 11, they can refuse that you are coming

to change our way of life and the aim of installing those I mean, that current operating system is to make at least students aware of what they are going to meet in the market, in the computer market. Let us say you are in the class teaching students about Windows 7, how to navigate in the Windows 7 operating system in the computer, while now we are in Windows 11, isn't it? So, you have taught them about Windows 7, and they are going to the market there. They will not find Windows 7 there; they will find maybe Windows 10 or 11. Now, there, you will find your Change Project will not be successful because what you are teaching in the class is not available in the market, is not consonant with what is already there in the market, you see, so there is that kind of challenging issue.

ICT-phobia and disconnect from learning: Most pre-service teachers with disabilities fail to connect ICT to their learning due to the phobia they have towards technology. Consequently, teacher educators found it cumbersome to mainstream inclusive education in teacher education via ESD, as presented below:

DWB: Students have got a very busy timetable, of which they can have maybe two or maybe three hours for them to learn basic ICT issues, so it is very difficult to first, get them. I think you remember on that day we only had four students, and four students they were very few students because every student had his schedule and some students do not see the importance of ICT at least maybe they fail to connect ICT with their courses that is why they do not feel that this ICT course is very important to them, despite that motivational speech we gave on that day but I can see that response of students is very little.

DWD: And another thing is a phobia. Many students have many phobias about learning these technology issues despite the motivational speech we gave on that day, the first day of the training. This is because many of them are very much conversant with the traditional technology in learning. After all, they started learning techies, braille, and info frame gadgets since standard one. Now, there is fear, and they fear using these ICT gadgets in learning their university courses and also using, for example, computers in writing the examination. So, through that phobia, for that matter, it can diminish, or it can make, I mean, students maybe respond negatively, or you can see them very few in the class, I mean, that kind of phobia really can hinder our project.

Bronfenbrenner's bioecological theory, using the PPCT model, provides insight into inclusive education, ESD and teacher education in Southern Africa, primarily through its Person component. It also elucidates the significance of the mainstreaming agenda through the Context component of the model. Moreover, the theory accounts for new learning opportunities from participants' activities within the *Tubadilike* ESD Change Project at DUCE. However, the PPCT model fails to explain how these new opportunities have facilitated learning for the teacher educators in the Change Project. In this regard, Vygotsky's ADL can provide the necessary explanation.

Vygotsky (1978) argued that the ADL can be considered a fruit of development. These are things that an individual has already achieved. This situation can be related to the *Tubadilike* ESD Change Project. The teacher educators said certain strategies would actualise the mainstreaming process. They believed that if they had a good financing model, changed people's mindset and established a link between ICT and learning, the inclusivity of pre-service teachers with disabilities would be enhanced sustainably. Arguably, the teacher educators achieved these understandings and capabilities through social interactions in the Change Project. Therefore, I used these concrete cognitive capabilities as a stepping stone to engage them further in expanding their learning (which I discuss in the next section).

We seized the ADL opportunities during the research process. We were passionate about setting an exemplary model that other institutions and entities could adopt. Therefore, we aimed to establish a commendable model that others could learn from. I emphasised showcasing the SST and the *Tubadilike* ESD Change Project, detailing the approach and the process, and providing a model for other institutions. Not all Tanzanian institutions participated in this SST programme – only a few were selected. However, I aimed to engage and encourage the DUCE teacher educators to continue engaging with others. This situation alludes to Vygotsky's argument that once an individual has achieved capability, the support should be reduced, and they can become mentors to others. If the DUCE teacher educators involved in this study identified other entities or institutions capable of replicating the ideas introduced in the *Tubadilike* Change Project, I encouraged them to do so. This expansion indicated the growth and sustainability of the Change Project.

6.3.5 Potential capabilities supported sustainability in the DUCE case

Through the ZPD support processes, the thematic data analysis shows that strategies for mainstreaming inclusive education in teacher education via ESD include training ICT specialists for pre-service teachers with special needs, policy shifting from content-based to competence-based, policy implementation involving pre-service teachers with disabilities, practising education for self-reliance in an inclusive approach, creating champions for change within the institution, putting guidelines for inclusivity, providing in-service training to fellow teacher educators, developing a short course on inclusive pedagogy, contextualising the wider university policy on inclusive education, designing an effective intervention based on the Change Project model, creating awareness among staff members and student teachers, and

developing multifaceted competencies for inclusive education. These themes are explained below.

Training ICT specialists for pre-service teachers with special needs: As one strategy for mainstreaming inclusive education in teacher education through ESD, participants suggested training ICT specialists for the pre-service teachers with disabilities, as shared below:

DI2: Another challenge is the trainer. I have not talked about the trainer because we do not have any source of funds for now, and we need staff knowledgeable about ICT for special needs because it is not ICT in general. It has to be ICT for students with special needs. So, we do not have a staff with that special knowledge, so we are using a PhD student from another campus. He is coming here, and we have to give him some fare, so it is the people who are involved in the project who have to make some contribution and give him some fare to come and go. So, he is also volunteering because more than what we give him is needed. So that is one of the challenges. So, if other people have to help, it will be with material support.

DI3: We have teachers with special needs, but, for instance, for now, we do not have a special needs instructor who specialises in ICT, and that is a very important need for the students for now. If we had that staff, then that staff could be training the students before they start their studies to be equipped with the ICT knowledge which is very useful for them during their studies. So, the personnel should assist the staff they need more training.

In the context of DUCE as an institution, I observed (DO1) that training ICT specialists for pre-service teachers with disabilities may be relevant to the Change Project and the mainstreaming agenda. Participants argued that ICT knowledge would foster inclusivity, as quoted below:

DI2: If they do not have ICT knowledge, they are somehow excluded from accessing information, but if they have ICT knowledge, then they have equal access because inclusive education means equal access to education despite their special needs, should be empowered with equal access to education equally. With ICT knowledge, they can access information and knowledge in the same way as normal people who are not impaired.

DI3: These two issues should be included in almost all subjects, all subjects because there is this, there is this kind of gap, for example, when we teach, teachers teach it. Those spheres also try to put them in the context of ESD and inclusive education. Those ICT gadgets accessibility is important.

DWA: The first need which I mentioned is that students with special needs, especially the visually impaired ones, do not have access to education as the other students, so what we are doing now as our Change Project is empowering students with special needs, especially the visually impaired ones to have ICT knowledge so that they can easily access information as any other people and to empower them to be more independent learners rather than depending on readers,

depending on notetakers and all that. We are trying to give them the power to be independent learners and to give them the power to access knowledge on their own.

DWD: I mean, to go on insisting on the importance of ICT to their subjects so that they can be able to link this project and their courses and also, we can use their time during weekends, I think they can get much time during weekends rather than during these weekdays because during weekdays their timetable is very tight of which it is very difficult to get all students at the arranged time during the weekdays, meaning that from Monday to Friday.

Policy shifting from content-based to competence-based: The participants also thought that schooling policy should shift from content-based to competence-based, as shared below:

DI1: For a long time, we focused on training individuals so that they could add understanding. It was more content based. Moreover, now is the right time to go for competence-based, meaning we train teachers to handle current needs. Whether we have good mathematics teachers, we need some language teachers so that they can go and fill the gaps.

DI3: So, that was content-based and not knowledge-based, we say. Now we think, and this can also be my contribution to this one, the competency we need to address, which is not now in our syllabus of preparing teachers, people who can do advocacy, who can become agents of the knowledge that they have, because that was what was lacking in our curriculum, it was not emphasised in our curriculum.

The policy shift from content-based to competence-based would also help to emphasise practice rather than theory as brought up in one of the workshops:

DWD: The project has revealed that sustainability starts with teachers because teachers are core. If you impart ESD knowledge to teachers, they can make their Change Projects very sustainable, so we are happy. As teacher educators, we want to change our students. The project has come to put our projects to be much more practical than theoretical, and maybe because it also includes people with disabilities, particularly people with visual impairment, to be part and parcel of the project, or we can say, to be specific, students with visual impairment to be part and parcel of the project because they have been left behind for so long and particularly in this issue of ICT. Hence, we are very happy, and the project has made up our issues, especially our education issues, to be much more sustainable and inclusive.

Policy implementation involving pre-service teachers with disabilities: Another strategy proposed for mainstreaming inclusive education in teacher education via ESD is that pre-service teachers with special educational needs or disabilities should be involved in the implementation of policies that concern them. One interview participant thought:

DI2: So, the issue which came to my mind is the students with special needs because the policies are there. The policies are very nice and well-structured, but the problem is the way they are

being implemented, especially in universities and colleges. Students with special needs must be met to access knowledge equally to other students, but in the implementation process, the students are not empowered to access the same. They have a different access to education than the other students. For instance, they cannot search for their materials, especially students with visual impairment; they are not empowered to do that. In some of them, someone takes notes for them, which means this person writes what he understands, so they need equal access. They have readers, so someone reads for them instead for themselves. So, there needs to be a solution in the implementation stage. Students with disabilities are not empowered enough to access quality education like any other student. So, that area needs to be strengthened.

Practising education for self-reliance in an inclusive approach: Practising education for self-reliance in an inclusive approach could be a strategy towards mainstreaming inclusive education in teacher education via ESD, as shared below by one interview participant:

DI4: Education for self-reliance should be practised in an inclusive approach. What does it mean? We have integrated programmes, we have special classes, and we have the general classroom. The policy, 2014 policy on education and training does not specifically specify how it would serve learners with special needs, so if we could have an explicit policy that states clearly that all teachers have to be taught in inclusive pedagogy, it could bring better results for teacher preparation programmes. Because we find learners with diverse needs from urban to rural areas from public to private schools, it is very important that teacher preparation programmes clearly state that all teachers should be taught on inclusive pedagogy.

However, this quest would require structuring teacher education curricula to include inclusive education and ESD concerns. This structuring would require political will to include ESD and inclusive education in teacher training programmes, as noted by one of the interview participants:

DI3: The curriculum should also be reformed to embrace these two issues. There should be a political will to include ESD and inclusive education in the teacher training programmes.

Creating champions for change within the institution: Spearheading change is always tricky. However, if there are champions for change, the process becomes easier, as shared in the workshops:

DWD: And I thought that kind of attitude on the office bearers that is what I can say, and I think to solve this one, I think is to do kind of, I believe in creating champions, you select a few people who are interested in management you involve them from the beginning like for example I go into some of the management meetings and the head for this special education unit was required to say what are you doing? From nowhere, the management should have given something or given some objective or support to do, but he was just asked what are you doing? What is your plan? What can we help? In that particular context, because I was there, he ended up mentioning our activities as one of the activities they are doing, and the management there was like; *very*

nice, this one we need to see it continue so tell us the budget, so it seems like they were like more celebrating after seeing some efforts and whatever and of course they are not aware who is giving the support they just congratulated the head of that particular unit. I saw that they are less likely to support if the result is not clear, but then I think slowly we need a pioneer, a champion, who has to sacrifice sometimes and, of course, let alone to see to help others realise the possibility.

Establishing guidelines for inclusivity: Participants were asked how they could support encouraging inclusive education in teacher education using ESD programmes they already had, such as the SST course. One recommendation was establishing guidelines on teacher education for inclusivity, as captured below:

DI1: The support is to put some guidelines, which I am already suggesting to my institution in the course of inclusivity. First of all, as a teacher and a psychologist to help my colleagues or my management to understand that when we say inclusion, what do we mean. This concept has sometimes been very difficult, and for me, I was most of the time very much concerned about trying to explain it to friends. At my university, for example, we have this inclusion policy, and we are always emphasising inclusion in the classrooms so that you take the individuals with disabilities so that they can sit in front seats. So, we were always discussing inclusive only physical, what about the strategy, what about the type of material you share, what about the language, what about the signal when you teach. For me, I can declare that I did a kind of activism or tried to make sure that at least we try to include the core aspects of learning so that in the way we behave, we ensure that our friend who is disadvantaged in any way is included not just in doing something which is showing that you are including but in terms of behaviour. That is one area which I tried to share at different meetings.

Providing in-service training to fellow teacher educators: Some teacher educators who participated in the *Tubadilike* ESD Change Project said that they would provide in-service training to their fellow teacher educators who were initially not involved in the Change Project. According to one interview participant, such training would help in mainstreaming inclusive education in teacher education via ESD:

DI3: As you know, I am a tutor here, now I will try my level best in those subjects I am teaching. I shall include these ESD and inclusive education spheres, and also, in our college, we have what we call on-job training or in-service training. Now, I will try my level best to request a session, a session for me to teach my fellow workers or tutors about ESD and inclusive education.

I then followed up by asking how providing in-service training would contribute to the mainstreaming agenda. The same participant continued explaining that training fellow teacher educators would expand the ESD knowledge base:

DI3: I think they are capable because by teaching my fellow workers, I mean they will get knowledge about ESD and inclusive education of which they can also supply that kind of

knowledge or they can give that kind of knowledge to also other people or other tutors in other colleges, and by including these two issues in my subjects, I will be imparting knowledge indirectly to students. That kind of knowledge can also be given to students by their peers in other colleges. So, I think the knowledge will be viral in that, I mean, using that technique. I am afraid of using things like seminars and workshops because they normally cost a lot, and you need to write a writeup and all that and all the projects to give knowledge to participants now it is expensive. Now, I will be using the same context, the same people and the same energy, the same thing I am using to impart that kind of knowledge about ESD and inclusive education.

Developing a short course on inclusive pedagogy: Another strategy proposed for mainstreaming inclusive education in teacher education through ESD was to develop a short course on inclusive pedagogy for teacher educators and teachers, as captured below:

DI4: We have already planned to develop a short course on inclusive pedagogy so that if we get funds, we may conduct training, several training workshops to sensitise the rest of the university community on how they should support learners with disabilities in class, but also at campus and outside the campus because after schooling there is the world, there is a world of work and work can be, is always in the community nearby or even in other countries. So, they are ready to enter the world of work, but with engagement in this project, we are also interested to continue working with the students with disabilities at our own cost, knowing for sure that we are preparing the future nation.

During my observations (DO2), I wondered how such a strategy would contribute to the mainstreaming agenda. The interview provided an opportunity to probe this matter further. The same participant extended their response to say that the short course on inclusive pedagogy would enlighten teacher educators and promote peer learning, as captured below:

DI4: They are good strategies in the first place because we are preparing teachers here for secondary schools and teacher education. So, the short course will first of all enlighten the lecturers, but also, we have teaching methods courses to students so it can also go to students directly so they will have the knowledge and skills on how to teach inclusive classrooms, and hence it will have multiplied effect when they go out for working in their districts or regions. Secondly, every year, the university admits students with disabilities, so the majority of them comes from high schools where they are not taught assistive technology or computer. I also said that we should be volunteering to teach them so that they cope with the digital world and be able to use the updated assistive technology devices to ease their learning but also to ease their examination take up and sometimes even for their leisure because with the computer they can play music.

Contextualising the wider university policy on inclusive education: As noted in Section 6.1, DUCE is a constituent college of the University of Dar es Salaam. The university has an inclusive education framework that guides teacher preparation on all its campuses. However,

the participants believed that the wider university policy needs to be contextualised to the college realities for implementation, as presented below:

DI1: I am one of the people at this college who proposed to have a policy for inclusivity. We have people we include as an institution, but I can tell you we have a policy for the university as a whole, and this university has several campuses. It is at the main campus, at the centre. However, this institution still needs to adopt this policy. Through our thinking and, of course, through the ESD project, we put it as a component that we want to adopt this one to put it also as our college contextualised kind of policy as we are doing with several other policies. We have a policy which we have adopted and contextualised. However, we are like not thinking of the institution; the university was already satisfied; it was not like seen as something that important through this project.

DWD: We have already started documenting what we must take, what we must change, and what to do. This is very important. However, again, some two years ago, I participated in some of the teams I can say all of the teams which have been instituted here to discuss how we can improve special education teaching here, going to other universities and trying to learn. At least in the previous two teams, which did some documentation, the university needed to learn, like lessons, so that we can improve ours. I have also been part of those teams, which gave me a chance to say that I am trying, and of course, that is my contribution. Apart from that, I also thought when we were starting this project that one of the areas that our undergraduate students and, of course, some of the postgraduate students struggle with is the time they use when doing their assignments. They are learning, and they want to have some information or to send some information. It was also my idea to use assistive technology so that they can at least do some of the things by themselves by use of ICT and use of technology so that it can help them. Moreover, I shared this with some friends, and that is how we came up with the topic we are now implementing in this project. That is what I see as my contribution if I can put it in a summary like that.

Designing an effective intervention based on the Change Project model: Much emphasis was put on the process support strategies that the teacher educators explained and how they could bring out or encourage issues regarding inclusion in teacher education through ESD programmes. One strategy that was proffered was the designing of an effective intervention based on the Change Project model, as captured below:

DWA: We have now planned. [X] is leading us to make sure that we continue with this effort, and of course, we have brought one of our bigger projects. Of course, we have submitted to request for kind of a pilot fund, a kind of steering fund, while we can at least create and do a comprehensive study on the needs and, of course, put much of the effort into the intervention so that we can have many. However, again, this programme helped us a lot with how to design, and what I like about this whole SST is the concept of a Change Project. This is what I think, even if I am sleeping, what I remember most characteristics of change. Now I know if I want to have a sustainable project, which is a change, what are the issues to consider, linking the current with the policy, current move, current demand, whatever making sure that it is, it is more of service,

you learn. However, you serve, at the same time, activity-based, which is something which is making us now, moving forward, meaning that we can design projects with such kind of characteristics. That is what I see from my perspective.

DWC: My teaching approach has changed. That is a big thing for me, and when we were designing the project, as [Y] said, this project gave us much light on how to write projects. As he said, when you start a project, the first thing before the project you think of funding, but now it is no longer about funding. It is about doing first and then looking for support where possible, so, really, it has opened our minds that you can start a project small, and then it can grow bigger slowly, and you can ask for support, and then for the management, it is easy to support as he said, if you show them this is what we are doing they are going to come in. So, we will see another opportunity to start projects without focusing on funds, but if we let the management know what we are doing, then we are confident they might chip in.

Creating awareness among staff members and student teachers: In proffering strategies for mainstreaming inclusive education in teacher education via ESD, participants were asked how they could encourage their immediate systems, such as the pre-service teachers, to promote inclusive education when they go to teach in schools having learners with disabilities and other biopsychosocial characteristics. They gave responses that encapsulated creating awareness among staff members and student teachers. Some of the responses from interviews are captured below:

DI1: So, for now, is like only some of the teachers are aware of the project, just a few of them. Through this project, we also plan to create awareness among the staff members. So, the project has a plan that we need to create awareness among the staff of a university as a college. So, the project will also help us create awareness among the student teachers they are being taught in their education courses about inclusive education.

DI4: But also, through meetings, we have departmental meetings, so when we are doing our meetings, we always remind them of the key issues about inclusive education during the college meetings and then also orientation week when the university is about to open a new academic year there is a session, we always encourage inclusive education.

Developing multifaceted competencies for inclusive education: Overall, teacher educators felt it necessary to bring together different competencies that would help the mainstreaming agenda. Some of the strategies suggested included challenging student teachers to showcase inclusivity during teaching practices, inclusive teaching methods to lead by example, staff exchange programmes, and applying 21st-century skills to contemporary problems. Some of the participants' responses from interviews and workshops on these strategies are captured below:

DI1: First, you know we have got what we called teaching practices. Now we can tell them that during their teaching practices, they should include these ESD and inclusive education practices so that they can start to learn these issues before even facing the mass school community when they are employed. So, we can start imparting, when we impart knowledge about teaching, about education skills, the common education skills, how to write lesson plans, how to write a scheme of work.

DI3: Now we can impart during those sessions, training sessions, we can impart their knowledge about ESD and inclusive education and emphasise that makes sure that your class, I mean consider inclusion in your class maybe do not mention, I mean to mention the name of the student rather than mentioning maybe his or her disability, make sure that when you ask a question pointing to one, to a student to answer, make sure that you consider gender, things like that; make sure that means, when you maybe prepare your teaching, your teaching strategies, your teaching methods, your teaching aids, make sure that you consider, I mean, environmental conservation, make sure that you do not make the environment to be dirt.

DI4: Teaching them and giving some seminar questions is promoting inclusive education, but also, while we are teaching, we insist they include different characters in their groups, in the first place, boys and girls or females and males, but secondly, those with disabilities, please, do not forget them but also insisting that you know when you are electing a group leader also encourage them to feel that they are full members of the group to take part.

DWA: Support systems include one exchange program between, let us say University of Dar es Salaam, more specifically, DUCE and Rhodes University, for example, all universities in Mozambique, Malawi, Zimbabwe, Ghana or Canada, whatever; exchange programmes will help in sensitising and increasing awareness level but also sharing the technology that the others have achieved and see how it can be customised in Tanzania.

DWB: Adding on what my fellow has said, for sure, Change Project, going beyond it, is that, to be able to sustain as an individual or as an institution or for any teacher programme or any other programme, we need to employ 21st-century skills, that is; communicating effectively, by collaborating, networking, thinking critically so that whatever issue is at hand is comprehended thoroughly and reach a sustained resolution.

The strategies presented above surfaced from the social interactions and collaborative learning engagements in the *Tubadilike* ESD Change Project. The stepping stone towards these strategies was the new learning opportunities the participants saw emerging from the Change Project (as presented in the preceding Section 6.3.4). As Vygotsky (1978) might put it, the formative intervention presented flowers of maturation through which the participants were supported to move from the opportunities (the already known) to the strategies (that were not already there), hence expansive learning. As such, the primary concern in the *Tubadilike* Change Project was the need for more recognition of teacher educators' abilities to strengthen the ESD aspect in mainstreaming inclusive education into teacher training via sustainable ICT

practices. This concern prompted the incorporation of Vygotsky's ZPD. Vygotsky's concept speaks to the gap between an individual's current developmental stage, determined by independent issue resolution, and the potential developmental stage, realised through problem solving aided by adults or more proficient peers. As in the Malawi case study, I played the 'adult guidance' role, not as an interventionist hero but as a formative interventionist researcher. Meanwhile, other teacher educators, particularly those familiar with the Change Project and having completed the SST online course, served as the more proficient peers. We worked together, supporting one another to enhance our existing achievements, known as the ADL, moving ourselves through the ZPD to broaden our capabilities. This expanded learning equipped teacher educators with strategies to strengthen ESD for inclusivity in teacher education.

6.3.6 Time dimensions can track the manifestation of sustainability in the DUCE case

The temporal features play an essential role in human development. Accordingly, participants were asked about the relevance of monitoring and evaluating inclusive education in the *Tubadilike* ESD Change Project. One workshop participant at DUCE said that the monitoring and evaluation present opportunities for revising programmes, as captured below:

DWB: Maybe let me add on that, it also helps us to revisit or to revise the programs but also to see whether we need any training to refresh the brains the mindset of the management and of the trainees.

Another participant said that monitoring and evaluation of inclusive education in teacher education in the ESD context give evidence for the successful implementation of the activities, as reported below:

DWE: It is important because that help us see whether it's really happening or we are just singing the song and it's not in practice, I don't know if that it is so.

Having established the relevance of monitoring and evaluation, I observed (DO3) that the focus should turn to ways the teacher educators could monitor and evaluate whether their teacher education programmes include and promote issues of inclusive education over time via ESD. Consequently, the teacher educators proposed ways to monitor the progress of inclusivity in this domain, including via strategic plans, framework of indicators, curriculum, policies and practices, assessment, evaluation forms, tracer studies and teaching practice. These themes are expanded below.

Strategic plans: One interview participant said that putting in place strategic plans can help in monitoring and evaluating inclusive education in teacher education in the ESD context, as presented below:

DI1: Whatever programme we begin, we should think of a sustainability plan and what things we are putting down to make sure that we put as an indicator if we are to make a right. So, the ways which I think, for example, for us here, most of the projects we are doing with a strategic plan so that we can monitor and conduct reflection every semester, and we identify whether there are some failures, successes or lessons that we can also improve. So, from here, I think if we put some strategies and techniques to improve inclusion here, then adaptation of similar methods of successful inclusion and try to monitor from time to time whether we are getting it right or there are some lessons that we are supposed to take. Furthermore, we have to put, first of all, the framework. If we have this policy, I could say that we need to have a policy that is a basis. Because the policy will tell us the monitoring and evaluation procedures, we can put in the indicators which show if we are keeping it or we are getting it down.

Framework of indicators: The participants proposed that there should be a framework of indicators for assessing inclusivity, e.g. independent living among pre-service teachers with disabilities, as suggested below:

DI2: First indicator will be, you know, now they are employing the readers, they are employing the notetakers, so the moment we can help this student to be able to stand on their own, no reader, no note taker that will be a very good *indicator*. Now, this student is empowered; he is an independent learner compared to when they were very dependent. Students with disabilities can access even the social life. If they can use social media like Facebook, I do not know, Instagram like any other person because we want also to improve their social life, it is not only academic life, if their social life on the access of information is on the same level as any other normal person, then that also will be a very good indicator.

DI4: Other things are just practical things through the estate department, so by seeing whether they are preparing ramps or they are putting some labels somewhere for people with disabilities to ensure that when they reach a particular point, they know they recognise so that can also work by just making a simple observation.

Curriculum: Participants also suggested two things related to curriculum as part of the monitoring and evaluation process. Firstly, there is an expressed need to mainstream ICT in the teacher education curriculum for pre-service teachers with special educational needs or disabilities. Secondly, there is a need to check the teacher education curriculum concerning issues of inclusivity and sustainability:

DI2: The indicator will be if we will succeed in mainstreaming the ICT training. That is our target. We are targeting for the ICT training to be mainstreamed. We plan to talk with the

management and see if they can mainstream it to become part of the curriculum so that these students are empowered with ICT knowledge before they start university studies.

DI3: You can cross-check the curriculum, you can cross-check and see whether or not they include inclusive education and ESD.

Policies and practices: Participants also talked about cross-checking with policies and practices as one way of monitoring and evaluating inclusive education in teacher education in the context of ESD:

DI3: Now you can cross-check in their practices, day-to-day activities, and there you can witness that there is this ESD and inclusive education, but also you can check it, you can monitor it through what, I mean by checking the education policy and cross-check if the country has got the inclusive education policy also, is another gadget to cross-check if the country does not, does not have the inclusive education policy, then it is an indicator maybe, that maybe that there is nothing in their curriculum and good enough, our country has got what we call inclusive education strategy just a strategy, it is not a policy. Now, by having a strategy, we can say there is inclusive education in our schooling systems.

DWB: But also, we can see from the management practice, attitude change, are they positive about the needs of these individuals? How are they attending? What about the budget issue in rolling the strategy? Is the rolling strategy having components on inclusive or special needs? However, also, when you look at the physical environment, how are the buildings structured? Do they have accessibility marks, standards prescribed in the disability law or prescribed by the code of accessibility? It will also help us to evaluate or to audit and see whether it is inclusion being practised.

Assessment: Assessment through tests and examinations were identified as one way of monitoring and evaluating inclusive education in teacher education in the ESD context, as suggested below:

DI4: In the first place, we can monitor whether inclusion is being practised or not during test and examination construction. Are there some questions, or components directed at inclusivity?

Evaluation forms: These were also identified as another way of monitoring and evaluating inclusive education in teacher education in the ESD context, as captured below:

DI4: We can develop an evaluation form which can be circulated at the end of each semester or the end of the year to staff or students with disabilities which will point out some of the key practical issues which can then they can respond to.

Tracer studies: To monitor and evaluate inclusive education in teacher education in the ESD context, participants suggested conducting tracer studies. One response to this thought is captured below:

DWB: As of now, there is, what is, the university doing tracer studies, so from the tracer studies also it informs what is missing for inclusive teacher, education planning, but to be able to check whether the running courses are inclusive is first of all observing, because they are available with us, see how much, there is content on inclusive education, but how many courses are also mainstreaming inclusive education.

Teaching practice: Participants also suggested teaching practice as a way of monitoring and evaluating inclusive education in teacher education in the context of ESD. For example:

DWB: Through the project, student teacher practices during their teaching practice as we are supervising them, we can learn and see how much they are paying attention to learners with diverse learning needs in the classroom because we always observe at least fourteen minutes classroom sessions for every student who is on teaching practice, so we can also check.

Bronfenbrenner (2005) highlighted that the Chronosystem allows for identifying the influence of past life events and experiences, whether individual or sequential, on subsequent developmental stages. In the scope of the *Tubadilike* ESD Change Project, the Time element (or Chronosystem) can observe and assess the strengthening of sustainability in mainstreaming inclusive education in teacher education via ESD. The bioecological theory emphasises that “the process of human development cannot be defined except in relation to time, since the central concern of developmental study is the nature of continuity and change in the biological and psychological structures of individual human beings throughout their life course” (Bronfenbrenner, 2005, p. 82). Thus, the teacher educators’ suggested ways, such as assessment, evaluation forms and teaching practice, have embedded temporal dimensions that can track change and improvements in inclusivity in teacher education in the ESD context. For example, through the tracer studies, one can establish the life course of a pre-service teacher with a disability, from teacher training to practice in schools and how they practise the knowledge developed from the *Tubadilike* Change Project. The DUCE Change Project is summarised in Bronfenbrenner’s framework as shown in Figure 6.4 below.

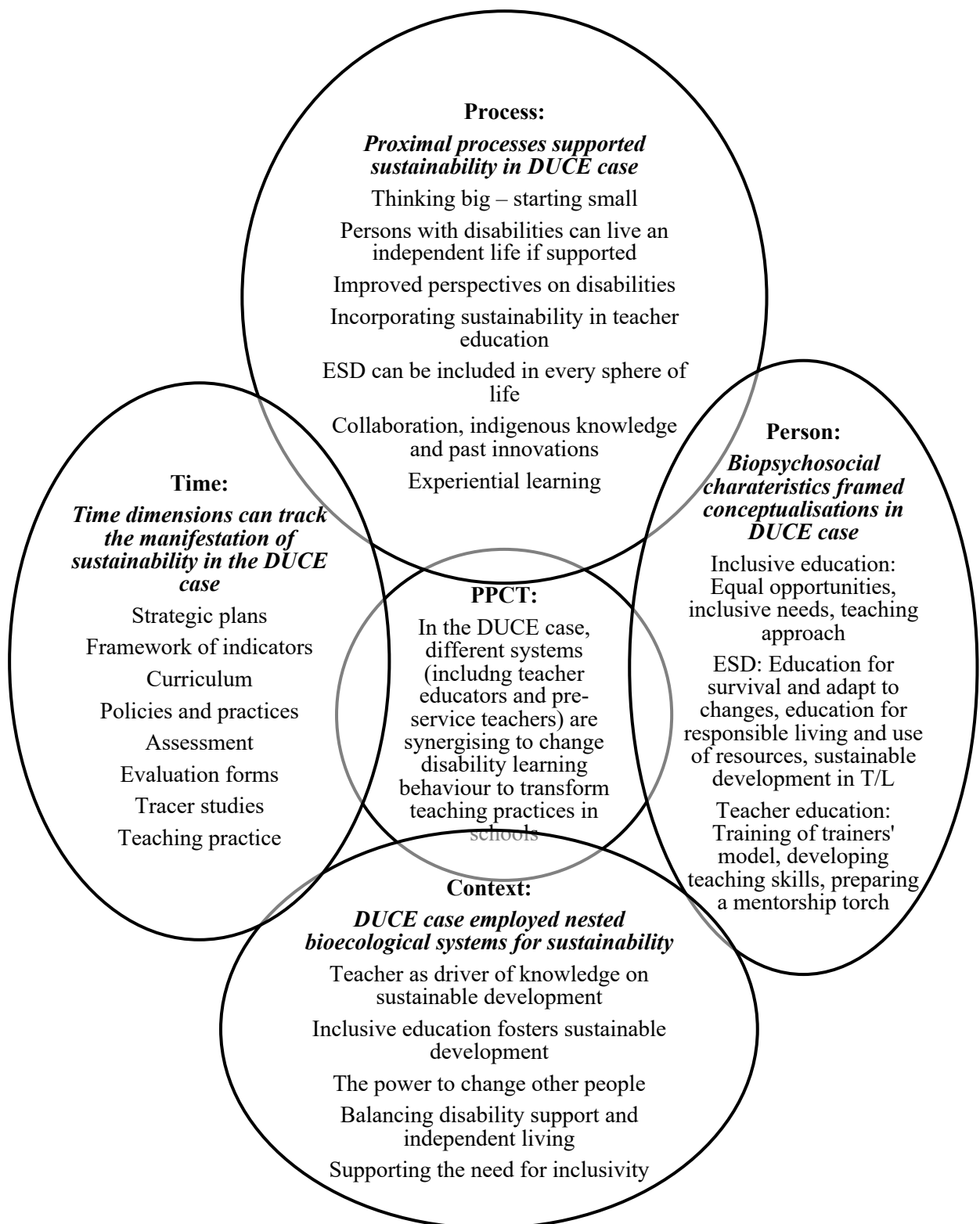


Figure 6.4: Bronfenbrennerian summary of DUCE case

The DUCE Change Project can also be summarised in the Vygotskian framework as shown in Figure 6.5 below.

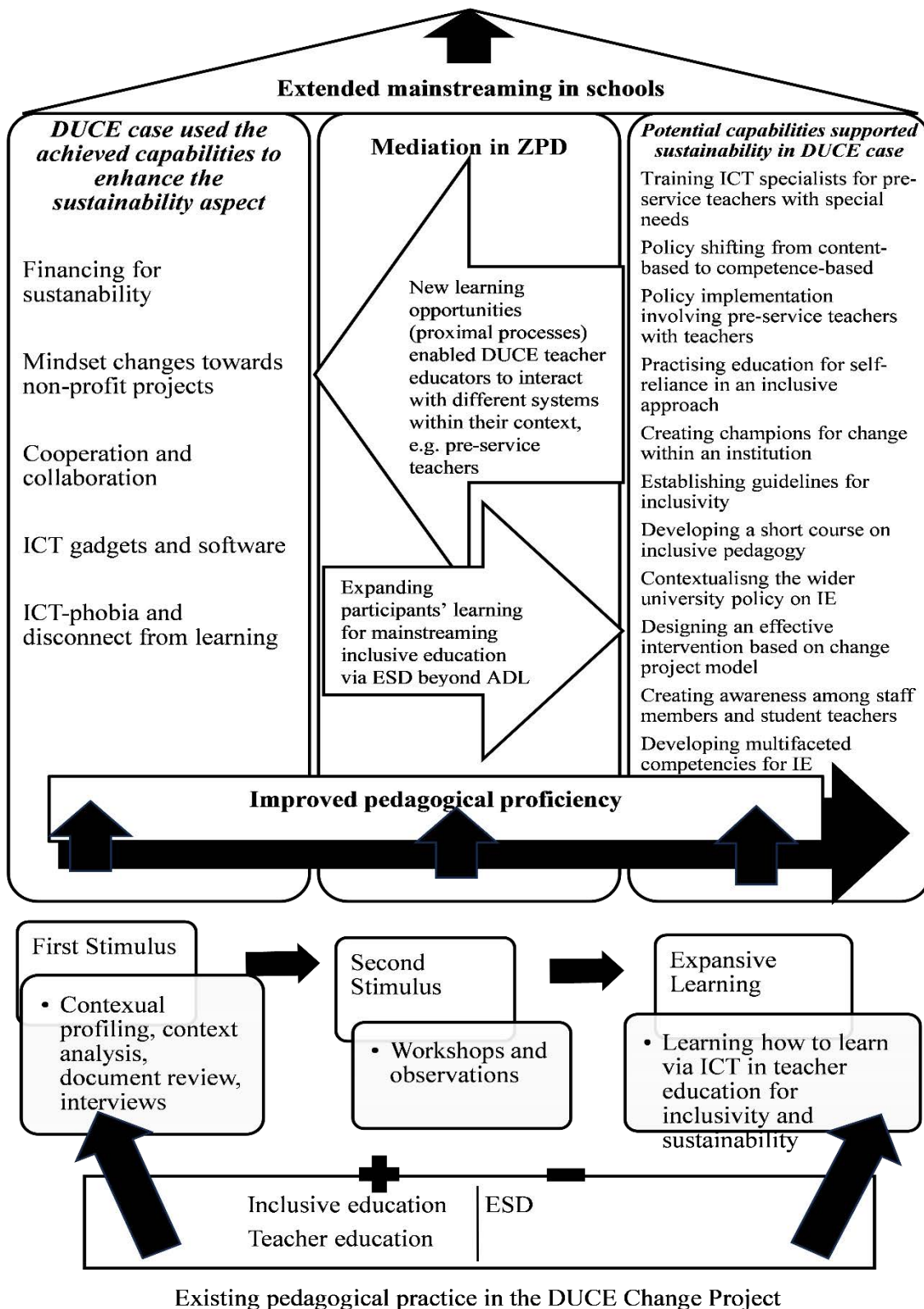


Figure 6.5: Vygotskian summary of PETTC case

6.4 Conclusion

This sixth chapter was a case analysis of Tanzania, where I originally worked with three institutions but ended up with one for focus and scope. Thus, the chapter focused on the co-engagement research process with SST participants at the DUCE. The DUCE case followed the same research processes as the one in Malawi, but a few adjustments were made to suit the circumstances of the context. Inclusive education and teacher education were strong in the DUCE Change Project, but the ESD component needed more support. As a formative interventionist researcher, I learnt a lot from the DUCE case study, such as indicators for monitoring and evaluating inclusivity that were not surfaced in the PETTC case study in Malawi. In the eighth chapter, I expand the indicators the participants noted, put them more coherently and highlight how ESD could be a catalyst for such indicators. Thus, I use the participants' proffered indicators (my ADL) to navigate my own ZPD as a researcher in this study while investigating the relationship that may exist between inclusive education, ESD and teacher education in a southern African context with Tanzania as a case. The next chapter is a case analysis of Eswatini.

CHAPTER 7

SUPPORTING TRAINING IN ESD TEACHER EDUCATION: ESWATINI

7.1 Introduction

This seventh chapter is a case analysis of Eswatini. In this country, I initially worked with three different teacher education institutions: Eswatini College of Technology (ECOT), William Pitcher College and the University of Eswatini. The ECOT case involved disability-friendly renovations of infrastructure. The William Picher College case involved recycling waste into teaching and learning aids for inclusivity. The University of Eswatini case involved employing Education for Sustainable Development (ESD) principles in inclusive teacher education settings. For the focus and depth of this study, ECOT was selected as the case study for Eswatini which is a Technical and Vocational Education and Training (TVET) institution. The college offers several programmes grouped into five faculties: Building and Civil Engineering, Business Administration, Education, Engineering and Science, and Information and Communication Technology (ICT). For the SST programme, the community of practice at the institution chose to focus on the built environment concerning inclusivity, sustainability and teacher training.

The formative intervention research at ECOT involved the same processes for Malawi and Tanzania but with some modifications to suit the contextual needs. Before the human interactions in the research process, a document review of policy and legal frameworks on inclusive education, ESD and teacher education was undertaken. The aim was to ascertain the conceptualisation of the three concepts before surfacing the same from the teacher educators. Then, individual interviews were done with three Sustainability Starts with Teachers (SST) teacher educators who were willing and readily available to partake. The conversations from interviews provided departure points during the three workshops at ECOT. Observations and reflections were also part of the research process. The first part of this chapter describes the Change Project at ECOT. The second part is an abductive analysis and a thematic presentation of the research findings. Figure 7.1 below summarises the ECOT research process.

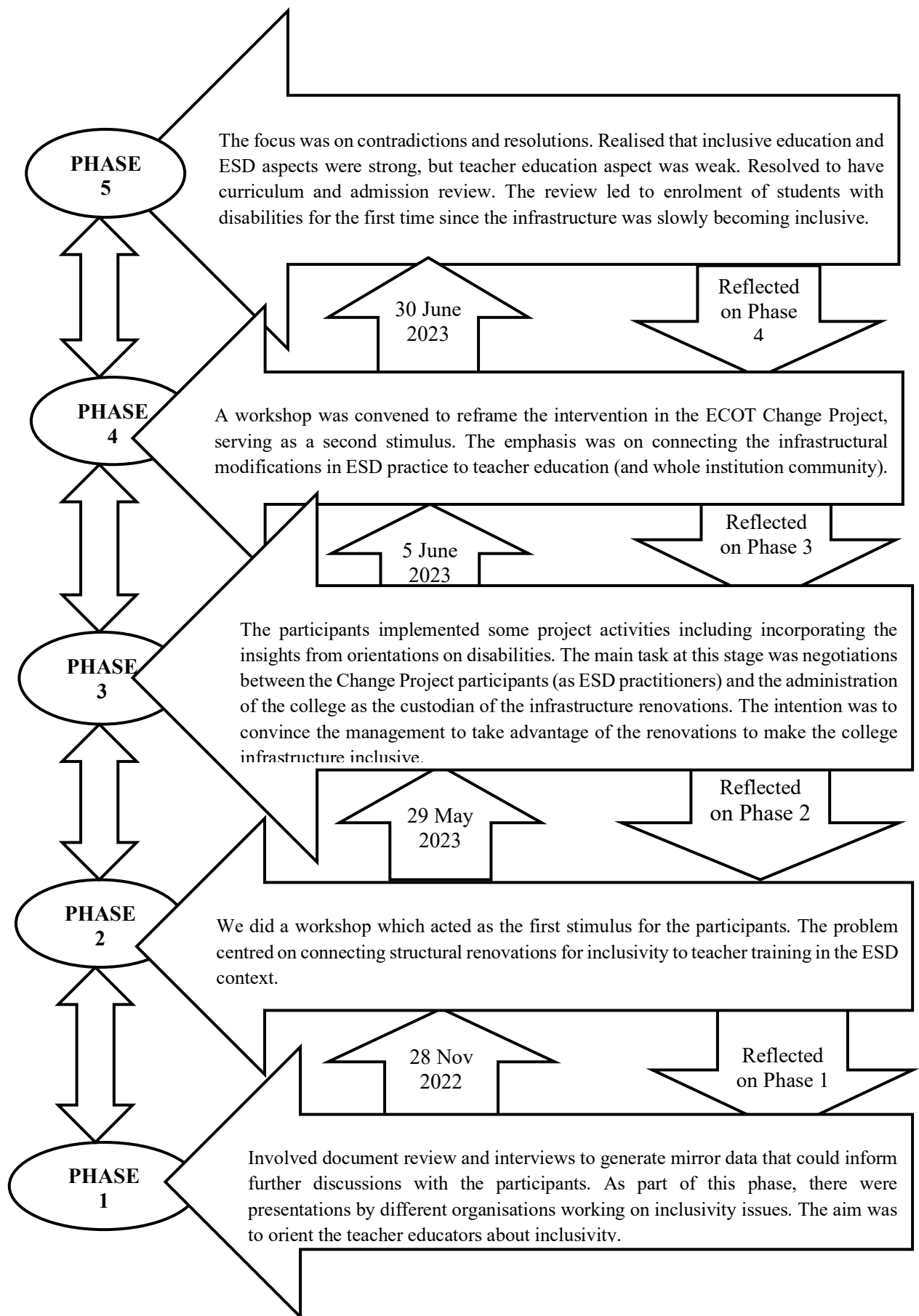


Figure 7.1: Summary of ECOT case research process

7.2 ECOT Change Project and Formative Intervention Process

As noted earlier, Eswatini was involved in the SST programme with Malawi and Tanzania as the third cohort (2021/22). Several teacher education institutions within Eswatini participated in the programme through institutional Change Projects and the individual online course. ECOT was one of such institutions. The ECOT ESD Change Project was titled “Inclusion of persons with disabilities at ECOT”. The participants named the Change Project *Vusetela*, which in Siswati means ‘renovate’. The idea was to advocate renovating the campus infrastructure so that the college accommodates pre-service teachers with disabilities.

7.2.1 Inception design

The ECOT SST team comprised lecturer representatives from all the faculties and departments. Initially, the community of practice started as a 14-member team but finished as a nine-member team. The participants emphasised having representatives from each faculty at the college. This synergy speaks to nested systems required for change in Bronfenbrenner’s bioecological model. Much as the *Vusetela* ESD Change Project concerned teacher education in the context of ESD, the community of practice comprised people from engineering and applied science, for example. It was this kind of collaboration that enabled innovations of ideas towards the objective of the Change Project. Bronfenbrenner (2005) argued that in a nested system, a developing individual (in this case, the teacher educators involved in *Vusetela*), is supported from within and across supporting systems with funnelling influences reciprocally. The ECOT teacher educators knew that coming together to brainstorm a Change Project, not only from the same discipline but transdisciplinary, would be imperative for change.

7.2.2 Situational analysis

Individuals with disabilities encounter challenges in pursuing education beyond the high school level in Eswatini, primarily due to the absence of inclusive tertiary TVET institutions. This circumstance hinders the realisation of inclusive and quality education for all (Sustainable Development Goal [SDG]4), leading to the exacerbation of poverty (SDG1), the widening of inequalities (SDG10), and the undermining of justice and institutional strength (SDG16). Upon the introduction of the SST programme at ECOT, numerous lecture and administrative rooms were found to be inaccessible for persons with physical disabilities, as depicted in Figures 7.2 and 7.3 below.



Figure 7.2: Lecture room at Eswatini College of Technology



Figure 7.3: Administration block at Eswatini College of Technology

Despite the challenges above, ECOT offers exclusive programmes and skills in Eswatini that align with a commitment to quality education for everyone, not just a select few. In the current global trend towards world-class educational standards, institutions that neglect the inclusion

of individuals with disabilities lag behind. The *Vusetela* ESD Change Project acknowledged that disability, whether temporary or permanent, can manifest suddenly or be imminent. Consequently, the institution aims to be welcoming to all as a learning and working environment. The *Vusetela* ESD Change Project was dedicated to transforming the built environment to foster inclusivity. Despite specialising in training teachers in commerce and ICT, ECOT still needed to set an exemplary standard for inclusivity. Recognising this gap, the *Vusetela* ESD Change Project sought to explore effective approaches to address inclusivity issues, specifically for individuals with visual impairments, deafness or hearing impairments and other physical disabilities. Bronfenbrenner (2005) observed that in a microsystem, activities, roles and relations are imperative in influencing an individual's human development interactively. The inaccessibility of lecture and administrative rooms at ECOT could be understood as constraining structures that affected activities, roles and relations for the pre-service teachers with disabilities.

7.2.3 Practical orientations

The *Vusetela* ESD Change Project unfolded in three distinct phases. Initially, the project concentrated on the priority phase before progressing to the second and, ultimately, the final phase of its implementation. Throughout this transformative initiative, ongoing monitoring and enhancements were implemented, expanding the project's scope to encompass other marginalised groups within the college. The initial focus of the priority phase was the ICT faculty, recognised as integral to all other faculties. Subsequent phases targeted specific areas, including hostels, the administration building and the college library. Aligning with Bronfenbrenner's (2005) propositions on the bioecological theory of human development, the interconnected and systematic processes in an individual's development became evident. This scenario mirrors the ECOT situation, where the prioritisation of the ICT faculty played a central role in influencing renovations for inclusivity. However, this influence intersected with other faculties, each wielding equally significant powers in shaping the training experiences of pre-service teachers with disabilities at ECOT.

7.2.4 Before the formative intervention

The inability to secure sufficient resources for infrastructural modifications posed a major obstacle to implementing the planned renovations within the established timeline. In addition, insufficient support from the college administration had a detrimental impact on the Change

Project. The prevalence of civil and political unrest in Eswatini during that period further impeded progress. Moreover, executing the *Vusetela* ESD Change Project amid the global COVID-19 pandemic presented many challenges for project activities. The demanding work schedules of many SST team members significantly hampered the smooth execution of project tasks.

Furthermore, teacher educators were burdened with heavy teaching loads and various institutional commitments. Multiple college closures disrupted the continuity of the team's collaborative efforts. These setbacks significantly impeded the progress of the Change Project at ECOT before the formative intervention within the SST programme. These challenges can be better interpreted within the theoretical framework of Bronfenbrenner's (2005) ideas on experience and personal development. External forces beyond an individual's control, such as unforeseen events and disruptions, can destabilise expectations and personal beliefs. However, through social interaction and support, it is possible to revisit and approach these setbacks with the aim of improvement. Consequently, the formative intervention in the *Vusetela* ESD Change Project sought to support the participants' ongoing efforts.

7.2.5 During the formative intervention

The first phase of the research process in *Vusetela* ESD Change Project involved document review and interviews. As was the case with Malawi and Tanzania research designs, the aim of this phase was to generate mirror data that could inform further discussions with the participants. As illustrated in Engeström (2011), mirror data enrich discussions in formative intervention research. Following this phase, we had a workshop which acted as the first stimulus to the participants. Since the first stimulus speaks to the problem in its original manifestation, the situational analysis done by the *Vusetela* ESD Change Project informed the outlook of the problem. The problem centred on connected structural renovations for inclusivity in teacher training in the ESD context. In the third phase of the research process, the participants implemented some project activities including orientations on disabilities. For example, a representative from the organisation for the visually impaired in Eswatini showcased the navigation of the environment using a white cane during a staff workshop on inclusivity for teacher educators as part of the *Vusetela* ESD Change Project, as shown in Figure 7.4 below.



Figure 7.4: Showcasing the navigation of the environment for visual impairment

Another activity involved a presentation from the school for deaf students during staff capacitation as one of the research activities, as shown in Figure 7.5 below.



Figure 7.5: A presentation from the school for the deaf

There was also a sign language interpreter for the deaf and hard of hearing and a representative for the physically impaired delivering their presentation, as shown in Figure 7.6 below.



Figure 7.6: A presentation on sign language and physical impairment

In the fourth phase of the research process, a workshop was convened to reframe the intervention in the ECOT Change Project. This workshop served as the mediating conceptual tool or second stimulus (Engeström, 2011). Motivated by a commitment to fostering change within the *Vusetela* ESD Change Project and aligning with the research interests, I facilitated the reformulation of the intervention in the *Vusetela* ESD Change Project. Through formative interventionist research, I encouraged the community practice members to enhance their endeavours despite the various challenges the college and the country faced, including civil unrest. This encouragement led them to initiate the inspection of infrastructure within the college for potential modifications, starting with the computer room in the ICT faculty, as shown in Figure 7.7 below.



Figure 7.7: Inspection of the ICT room at ECOT

The team also inspected hostel bathrooms which were found to be in a dilapidated state and inaccessible to those in wheelchairs, as shown in Figure 7.8 below.



Figure 7.8: Inspection of hostel bathroom

In the fifth phase, the focus was on contradictions and resolutions in the *Vusetela* Change Project. Prima facie, the *Vusetela* looked like a well-conceptualised Change Project that resonated with the participants and the SST programme's intentions. However, the participants and I realised that the inclusivity component was very strong in the Change Project; in the same way, the infrastructure modifications would afford teacher educators and pre-service teachers with disabilities a conducive environment which could be replicated in schools. We also realised that the aspect of ESD, especially sustainability, was strong in the Change Project regarding infrastructure accessibility and building for the future concept. However, we realised that the notion of teacher education was weak. The participants could not explicitly connect whatever they were doing in the Change Project to teacher education praxis. This situation defeated *Vusetela*'s and SST's intentions, hence the formative intervention. The resolution was to have a curriculum and admission review so that issues of infrastructure in the college could be checked. The initiative fostered awareness and collaborations to promote inclusivity in teacher education in the ESD context. Theoretically, the initiative speaks to the interactions of systems in the Context component of Bronfenbrenner's (2005) Process-Person-Context-Time (PPCT) model in which these systems do not merely interact. Instead, they influence the systems they interact with in the web. For example, an organisation for persons with disabilities considered an exosystem in *Vusetela*, contributed to the Change Project.

7.2.6 After the formative intervention

In the *Vusetela* ESD Change Project, the members had already learnt how to approach their initiative. This situation could be better understood using the theoretical levels of Vygotsky that individuals are not tabula rasa. They always form some meanings from the sociocultural interactions they have in their learning environments. The participants managed to inspect the infrastructure and determine what needed to be done within the scope of their Change Project, bearing in mind that *Vusetela* was conceptualised as an ESD Change Project on inclusivity in teacher education. Vygotsky (1978) argued that "learning is more than the acquisition of the ability to think, it is the acquisition of many specialized abilities for thinking about a variety of things" (p. 83). Applying these words to the *Vusetela* Change Project, we were able to expand our thinking (learning) about how the participants were implementing the Change Project. Therefore, I created a zone of proximal development (ZPD) (see details in Section 7.2.5 on during formative intervention) in which the teacher educators could navigate their potential in strengthening teacher education in the *Vusetela* Change Project.

7.2.7 Key outcomes

The ECOT ESD Change Project generated significant value, fostering quality education, equality, economic sustainability, diversity acceptance, collaboration and teamwork. These results were achieved through the ECOT community capacity-building workshops on inclusivity in teacher education via ESD. During the workshops, participants conducted site inspections on structures earmarked for modification in the first phase, including the administration block, library, ICT, and certain hostels for both genders. The participants also quantified and analysed the cost of materials required for priority phase modifications. Notably, the ICT faculty received capacity building on inclusive education, serving as a pilot case. The ICT academic and education staff undertook curriculum alignment and modification.

7.3 ECOT Research Findings and Analysis

This section advances the analysis and presentation of the ECOT case through abductive analysis. Essentially, the section looks deeper into the emergent themes by employing the study's theoretical framework: Bronfenbrenner's (2005) bioecological theory of human development and Vygotsky's (1978) sociocultural theory of learning. As previously highlighted, it became apparent that teacher education required greater support within the *Vusetela* ESD Change Project at ECOT. Consequently, the abductive analysis in this section focuses on the support provided to enhance teacher education in the Change Project. However, inclusivity remains the primary focus of the study and received equal attention alongside ESD.

7.3.1 Biopsychosocial characteristics delineated conceptualisations in the ECOT case

In the Person component of the PPCT model, individual characteristics are critical in supporting human development as one interacts with others. These individual biopsychosocial characteristics define how concepts like inclusive education, ESD and teacher education are understood and conceptualised. The thematic analysis of the policy documents and ECOT research data shows that the conceptualisation of inclusive education centres on equal educational opportunities regardless of disabilities and collective learning. I argued earlier that the teacher educators' experiences and beliefs about inclusive education form part of the Person component of the analysis. Thus, the teacher educators who participated in this study believed that individuals should be given equal educational opportunities despite whatever disabilities they may have. Again, they believed that when such opportunities are offered, people would

learn collectively in advancement of knowledge. Concerning ESD, the conceptualisation was that ESD is the kind of education that fosters survival skills and education for the future. Equally, the teacher educators deduced this understanding of ESD from their experiences and beliefs. Hence, these fall into the Person component of the bioecological model. For teacher education, the conceptualisation centred on changing mindsets and perspectives and gaining skills for imparting knowledge to others. These are cognitive understandings deduced from the teacher educators' experiences and beliefs. As presented below, a few themes emerged on the conceptualisation of inclusive education from the policy documents and teacher educators' perspectives.

Equal educational opportunities regardless of (dis)abilities: Inclusive education has been delineated as a system that affords equal educational opportunities for all learners regardless of their (dis)abilities. The country's National Education and Training Sector Policy of 2018 indicated the following:

Inclusive education and training acknowledges that all children and youth can learn and need support to do so. It involves uncovering and minimising barriers to learning whilst enabling education structures, systems and learning methodologies to meet the needs of all learners. Furthermore, it involves changing attitudes, behaviour, teaching methods, curricula and the environment to meet the needs of all learners. It acknowledges and respects differences in learners, whether due to age, gender, language, level of development, disability, HIV or other circumstances. It is about maximising the participation of all learners at all levels in the culture and the curriculum of educational institutions. (Eswatini. Ministry of Education and Training, 2018, p. xi)

Thus, from a policy perspective, inclusive education widely encompasses issues such as disability, gender and social status. However, during the interviews and workshops, inclusivity was specifically connected to disability. In the interviews at ECOT, participants said:

EI1: Inclusive education, for my understanding, is that every child should be given a chance regardless of a disability. Disability should not be a hindering factor for them to get into any form of education.

EI2: My understanding of inclusive education is that it is just about acknowledging that every learner needs to learn; every learner has the potential to learn, so as educators, we need to give them support; we need to eradicate the barriers they face every time they try to learn regardless of who they are or their abilities or disabilities.

Collective learning: Inclusive education has also been conceptualised as a process of collective learning. Inclusive education allows learners of different abilities to contribute differently to the learning process. Essentially, “inclusive education requires the development of a flexible system that includes a range of different learning environments and different kinds of support so that all individuals can learn effectively according to their intellectual capacity, skills, talents and interests” (Eswatini. Ministry of Education and Training, 2018, p. 12). In my observation at ECOT (EO1), I came to realise that the college encourages teacher educators and students to do things together within and across their groups. One interview participant thoughtfully and deeply articulated this conceptualisation as presented below:

EI3: Inclusive education has got to do with, this springs the idea of let us do things together, you know, let us stop being individualistic, it is not about me. It is about us. It is about what we can achieve, and it is about having found something that works, something that can sustain us, something that can contribute and how then do we share these amongst ourselves, amongst the people we live with, and for me, that is what inclusive education involves. Let us be accommodative of one another in what we do. Inclusive education has got to mean that there is something that exists somewhere, or there is something that you know that I may not know. It may be your field, just outside your field, just about life in general, and it takes me to say, what is it that I do not know? I am willing to learn something to contribute positivity to life in my field or outside my field. What keeps us going? Can I know something in your area? What is it? How can we contribute? That is what inclusive education means.

Education for Sustainable Development (ESD) is understood differently in different contexts. The themes below form the emerging conceptualisation of ESD in Eswatini.

Education that fosters surviving skills: ESD has been conceptualised as education that fosters survival skills. The National Education and Training Sector Policy of 2018 observed:

ESD requires that nations and their peoples learn their way out of current social and environmental problems and learn to live sustainably. ESD aims to help people to develop the attitudes, skills and knowledge to make informed decisions for the benefit of themselves and others, now and in the future, and to act upon these decisions. The primary goal of ESD is to develop norms and values and change practices and lifestyles to ensure sustainable living. Thus, ESD is an essential link in the poverty reduction, health and environment protection chain. (Eswatini. Ministry of Education and Training, 2018, p. x)

The observation above resonates with the aspirations expressed in the country’s Education Sector Strategic Plan (2022-2034) which designates ESD as a way towards national development. The research participants shared the same position:

EI1: Education basically should make you a better person in terms of how your survivor techniques in whatever community you are coming from, of which to me it was from the perspective that resources are there, but of course, education enhances you or maybe appreciate them, better even if you can have them, you can be able to use them.

EI3: Education for Sustainable Development, it says, okay, some things keep us going, yes, and are there ways to be introduced? Is there a system that we can conform to, that, when we put to practice, can keep a balance of things, you know, that keeps us that keep the world going in all its entity?

Education for the future: Apart from being education for survival skills and responsible resource usage, ESD is also understood as education for the future, as captured below:

ESD aims to help people to develop attitudes, skills and knowledge to make informed decisions for the benefit of themselves and others, now and in the future, and to act upon these decisions. For sustainable development to be achieved in Eswatini, the education and training system needs to reflect the SDGs and also a view of the world as a holistic sociocultural, economic and ecological integrated system characterised by constant change. (Eswatini. Ministry of Education and Training, 2018, p. 11)

EI2: ESD is basically about education for the future, as it is quite said that education is key to success. For one to be successful these days, you need to be educated sustainably, meaning in a way that will enable you to cope in the outside world, to cope with the standards of living, to cope with everything around you.

The study also intended to surface the conceptualisation of teacher education from the policy documents and the participants because the understanding would give a picture of teacher education programmes at the institution and country as part of schooling systems. Below are some of the themes that emerged.

To change mindsets and perspectives: Teacher education was conceptualised by the participants as an education system for changing mindsets and perspectives. These are captured below from interviews and workshops conducted at ECOT as part of the formative interventionist research:

EI1: It changes somehow the mindset, that is why even from growing up, you realise that the person who has not been to school, first, it will take away something besides being a teacher, so now having to be able to change somebody's mindset and be able to survive in a different perspective, know how to use resources effectively, it needs a special skill, and people generally are different. So, to be able to impart knowledge to such, especially from a young level up to a level of tertiary institutions now, you are now even getting a skill of some sort.

EWA: It is all about empowerment. Once the people are empowered, they are capacitated with the right knowledge. They will know what is right and wrong, they will know what it means, what it calls for to be inclusive, to be able to embrace and accommodate others, because inclusivity is about changing the mindset of people to have the knowledge that we are different, we are not the same so, we need to be able to embrace one another. That is where the change of attitude comes in. We must be able to accommodate one another in one way or another. Whatever we are, whatever we are doing, we all have to participate in something, not that others are left aside because of some disability or whatever.

To gain skills for imparting knowledge to others: Teacher education is also understood as gaining skills for imparting knowledge to others. The National Education and Training Sector Policy (Eswatini. Ministry of Education and Training, 2018) indicated that “the outcome of teacher education is to prepare teachers for the transmission of knowledge, independent thinking, organisational skills and development of learners’ personalities in preparation for their contribution to society” (p. 32). In agreement, interview participants shared the below:

EI1: For one to be able to impart knowledge and skills to others, they need to be trained. They need to be educated because you cannot have that skill. Let us say, for instance, make an example of school leavers. One can be capable of assisting others in mathematics. However, without the proper skill and knowledge of how to impart the knowledge to the next person, you will not be able to do it well, so teacher training is so imperative on that aspect that you need to know psychological and philosophical aspects of everything pertaining education because as we all know a person is comprised of various aspects.

EI2: A teacher can, that is trained, to explain things at the level that audiences are, a teacher is trained to explain and to, you know, also to use, what is this, to use what is available in trying to explain concepts and therefore why a teacher they are for in our institution in the country for guidance purposes to the young lives that are placed at our hands. A teacher is someone who will impart to generations the skills and knowledge they have; the experiences they have gone through they can impart for generations. So, number one for guiding the learners that are at their disposal. Furthermore, number two for facilitating, you know, experimental learning, we say that teachers have the knowledge, but what we want with teachers is to create an environment where they can facilitate the learning, get to a relaxed mood, what to do about such and such a topic and then they tell you what they know. So, a teacher can make those determinations of facilitating experiential learning.

EI3: We also need teachers for the structure development of the child. There are levels in the growth of a human being, and so we train teachers to have that structured development of the human being. Lastly, for training on how to handle the learners themselves, for training how to handle the audience, let me say who are learners in this particular case.

The conceptualisations presented above form biopsychosocial characteristics that shape an individual’s understanding of their environment. In my understanding, such characteristics

would manifest in and operate from an individual's cognitive understanding of their practices. Thus, the conceptualisations that the policy frameworks and the teacher educators indicated are part of the human features that are determinant in human development, i.e. the *Vusetela* ESD Change Project at ECOT. Consequently, the conceptualisations of inclusive education, ESD and teacher education in the context of ECOT and Eswatini are crucial in supporting teacher educators and actualising the mainstreaming of inclusive education in teacher education via ESD for inclusive pedagogical proficiency.

Experiences and beliefs determine how the teacher educators engage with the pre-service teachers with disabilities in ESD. Much as they had these beliefs and experiences, they could not connect what they were doing in the *Vusetela* ESD Change Project to the teacher education praxis. During the formative intervention stage in the Change Project, the first step was to critically analyse these experiences and beliefs. Then, we examined the three concepts: inclusive education, ESD and teacher education. For inclusive education, we established that the renovations that were advocated in the *Vusetela* Change Project would indeed make pre-service teachers with disabilities truly included in the institution. For ESD, our establishment was that the renovations emphasised building sustainably for the future. If these disability-friendly infrastructure designs were made in the first place when the college was constructed, the government and its partners would not have to spend more money now to redesign and renovate them for disability access.

However, there needed to be more connection to the curriculum regarding teacher education. With a theoretical understanding that in the Person component an individual is not exclusively shaped by their characteristics, I offered my perspectives that helped to enrich participants' experiences and beliefs to the extent that we found a connection to the curriculum – that when the teacher educators are co-engaging with the pre-service teachers with(out) disabilities, inclusivity and sustainability should not be limited to only the classroom practices. The outside environment, such as the infrastructure, is critical for inclusive education, and the teachers, when they are in the schooling systems, can use their agency to advocate physical accessibility should they find themselves in such a disability-unfriendly schooling environment.

7.3.2 ECOT case engaged nested bioecological systems for teacher training

In the Context component of the PPCT model, nested levels or systems work in an influencing web. As Bronfenbrenner (2005) indicated, the five nested systems, i.e. micro-, meso-, exo-,

macro- and chronosystems, profoundly influence the bioecology of human development. Relating this theoretical disposition to this study, the influences manifest in the essence of inclusive education in teacher education via ESD. Accordingly, the thematic analysis showed that it is essential to mainstream inclusive education in teacher education via ESD because educating inclusively and sustainably starts from teacher training. Again, inclusive education leads to changing attitudes towards disabilities and promoting accessibility to education. Presented below are details of the themes that emerged.

Educating inclusively and sustainably starts from teacher training: Teacher training was identified as a binding force behind inclusive education and ESD, as shared below:

EI2: For one to be able to educate inclusively, to educate sustainably, they need those skills they have got from those teacher training institutions.

EI3: There must be someone at the centre who can understand the concept but also be able to engage with everybody to understand certain concepts that may not necessarily be understood and presented structurally.

Changing attitudes towards disabilities: Attitudes towards disabilities were seen as a cross-cutting issue between inclusive education, ESD and teacher education. In the workshops, participants shared the following:

EWA: As much as we are moving in the right direction, my only glitch or concern with inclusive education is attitude. We were capacitated, and the workshops were for 2 to 3 hours, and it was okay, but the attitudes of the people there. As much as they welcomed the idea of inclusion, including everyone, they could not have been more comfortable, or, should I say, not so welcoming, to the idea on the ground. They felt it would be much work. They felt it would be outside their scope of teaching because now they thought they needed to accommodate this one individual joining the students.

EWK: Attitude is not something you can deal with in a day. Changing somebody's attitude toward something takes some time; it is a process; it is not just a once-off thing, so I think if there can be regular workshops and seminars on this inclusivity thing, we can see some positive changes in the attitude with time. I think it is mainly about creating a level ground for all, yes, a conducive environment, a conducive working and learning environment, for everyone to live in this institution peacefully and work efficiently and effectively.

Promoting accessibility to education: Access is key to inclusive education in teacher education via ESD. One workshop participant shared the below:

EWK: Every person needs to access every area of this institution, so through this project, we want to eliminate barriers that bar people from accessing some areas of the institution. If I can give an example, this building, we are on the second floor, for instance, somebody in a wheelchair cannot access this office right here we are now because there is no way somebody in a wheelchair can come up here because this building is only steps, steps up here. With those small modifications here and there, whatever they are, maybe ramps or lifts, maybe that person in a wheelchair can access the upstairs.

In the microsystem, Bronfenbrenner (2005) talked about activities and relations that interact between the Person component and the individual's environment. For example, the *Vusetela* teacher educators engaged in the renovations for disability inclusion; prima facie, such efforts look trivial and misplaced. However, infrastructure is one critical influencing system that would inform inclusive and sustainable teaching and promote accessibility to education. Again, with accessible infrastructure in the college, attitudes towards disabilities change because an enabling environment is created for such individuals to interact with others, which Bronfenbrenner's theory regards as imperative in an individual's development. Such interactions would form mesosystems necessary for actualising the mainstreaming agenda. The infrastructure is a subculture that shapes who ECOT enrolls to train as a teacher in commerce or ICT and other specialisations. Since the subculture is becoming enabling, the macrosystem would influence how the microsystem, including the enrolment systems and teacher educators' practices, accepts pre-service teachers with disabilities. Such system interactions would provide a model that could be replicated in schools once the trained teachers are deployed.

7.3.3 ECOT case embraced proximal processes in teacher training

The interactions of the *Vusetela* teacher educators with their practices, peers and policies within ECOT formed the Process component of this study. Such systematic and interactive processes manifest in the new learning opportunities from the *Vusetela* ESD Change Project. From the thematic analysis, the data show that new learning opportunities centred on inclusive development, admission of students with disabilities, renovations for inclusivity, and interrelatedness of SDGs. Bronfenbrenner (2005) would call these new learning opportunities *proximal processes*, "the primary engines of development" (p. 6). The "development" in the context of this study entails capacity building for the teacher educators at ECOT to mainstream inclusive education in teacher education in the context of ESD in Eswatini. These new learning opportunities that emerged from the *Vusetela* ESD Change Project among teacher educators at ECOT through the SST programme are presented below.

Inclusive development: Inclusive development is one of the new learning opportunities that emerged from the *Vusetela* ESD Change Project, as captured below:

EWD: We are in the fourth industry revolution; we are quite aware that economic and political changes do not only affect capable people. We must be inclusive of all human beings, physically challenged or otherwise, so that we all move at the same pace or towards the same direction, changing the country's economy.

Admission of students with disabilities: Participants said that they never imagined the institution enrolling students with disabilities previously. Since the inception of the *Vusetela* ESD Change Project, the administrative willingness to accept such students has become apparent, and the college is now open for these admissions, as shared below:

EI1: Affected somehow in another area, we are affected, but what I have learnt is that in as much as myself, somehow there is someone linked to me who is affected, and even if it is not me tomorrow, I might also be affected, I have known people who might think like stigmatised others.

EI2: We are dealing with learners from various backgrounds with different issues and capabilities, you see. So, as an educator, I need to be informed on how to handle how to accommodate every individual learner in the classroom environment. I need to incorporate various teaching and learning styles and strategies in the classroom environment that's all about inclusive education.

EI3: Education is a right of all people. It is a right of all people. We should not be seen as an institution to be segregating others. We should be striving to promote our courses; we should be striving to be including new programmes and courses in the education we teach. So, this is a very actually, it is something that had to be done a long, long time ago. We are embarrassed that we are speaking about this in our institution today.

EWE: I think about the admission intake of one physically challenged student. I think it is a step in the right direction whereby they are also capacitated but not fully in handling and being able to communicate and also teach a student who is physically challenged, which I think is part and parcel or in the right direction of our Change Project.

EWD: The only way we can, or one of the ways we can try to sustain the initiative, is enrolling students who will use the changes because it would not help if we make ramps and there is nobody to use them. We have a lift, and there is nobody to use them. So, if we make sure that when we enrol students, they will be included, the individuals will use the new changes and facilities that will be introduced, which is one of the ways we can try and maintain.

EWC: My response will align with the first response you got from this question that my colleague has said will be that we enrol students who will use these facilities. I agree, but I also want to say that we will push for the institution to make regulations that will force the inclusivity aspects because they are resources that will have been used, so there must be regulations in the institution

that will safeguard these resources that would have been put in this project. For example, if we put a quota to say that the institution in every enrolment that is done there is a certain quota that it has to take for students that will be enrolling on the inclusivity aspect so that it is something that cannot be shelved away in any year of the institution every year it will happen to be there because we do intake every year. So, having regulations to safeguard whatever investment would have been done is one way to forward.

Renovations for inclusivity: The ECOT *Vusetela* ESD Change Project renovations were conceptualised long before the SST programme. However, with the way the renovations were designed, it was apparent that no disability accommodations were thought through. Thus, through the SST Change Project initiative, the teacher educators advocated revisiting the renovation designs concerning inclusive building. Therefore, renovations for inclusivity came out as a key learning opportunity in the *Vusetela*, as shared below.

EWA: The Change Project has successfully ensured that the first phase of the changes in our hostels is done and the ramps and pathways to access the hostels have been built. The bathrooms and toilets have been done to incorporate the changes.

EWD: We saw some renovations being done, and it was our interest to have them be inclusive of all kinds of students, so it is a step towards the right direction that there has been some consideration. Though not fully fetched inclusive structures, at least something needs to be done in that respect in the residences for students. That is what has been an improvement. Also, we have spoken to the community about inclusivity through this programme. We held workshops, and we spoke to the college community, sensitising them about this, so when we see some changes, I think the staff will be at least welcoming, not rejecting, and this is a plus that has come due to the SST course so when our colleagues say that there was an interpreter at orientation, I think the whole staff will be appreciative of the course.

Interrelatedness of SDGs: One of my observations (EO2) suggested that the ECOT Change Project encompassed many SDGs. During the interview and workshops, this observation was vindicated. Participants shared that they learnt that SDGs are closely intertwined, as captured below:

EI2: I have learnt a lot. I have learnt a lot about the SDG goals involved, poverty issues, waste management issues, political issues, and sanitation issues, it is a lot. And importantly climate change issues because climate change mostly affects sustainability.

EI3: The realisation that the world is a system of systems, and it is like you are saying this is a clever world. You are not living on your own in your own space. Whatever you do here, has got consequences, whether good or bad.

EWB: In the field of education, including persons with disabilities is a vital aspect because it is in line with what was proposed by the UN and what is enshrined in the SDG goals for the 2030 agenda. It is also because, as an institution, we are trying to align with that. We are trying to move with what the world is looking for outside there.

EWD: I would say that one of the things that we begin to understand, or should I say that we should understand with education in whatever field, is that education has to offer solutions to existing challenges so, as we go about in our different fields of teaching it is of no use if we teach and that teaching does not translate to bringing solutions to our everyday challenges. So, the ESD had brought up that aspect, which one may say was not brought up before or what needed to be added before to say we are just teaching because there is a syllabus before us. However, we have to translate our teaching to solution-oriented problems. What is the challenge that we are achieving or that we are trying to solve by doing whatever we are doing, what is the challenge? So, inclusivity is one of the challenges that the world is facing. There are many other fields we speak of today. Climate change is the challenge that is facing the world, and in whatever we do in order to preserve this planet, we must be cognizant of these challenges that are facing the world and what solutions we can bring in our ESD as we do whatever we want to bring the issue of inclusivity because it is a challenge that is facing this society and the whole world.

In the Process component, Bronfenbrenner (2005) emphasised the nature and form of systematic interactions an individual has in their physical, social and cultural environment. The *Vusetela* SST participants identified renovations for inclusivity and inclusive development as new learning opportunities from the ESD Change Project. The inclusive development comes in the form of the renovations at ECOT that would ensure that pre-service teachers with disabilities are equally afforded training opportunities. This situation can be called a *proximal process* that would ensure the inclusion of such pre-service teachers and develop teacher educators' proficiency regarding inclusivity issues.

Similarly, admitting students with disabilities is a developmental process, as in the Process component. The relation between and across an individual and their contexts is interactive. In the first instance, the college could not enrol pre-service teachers with disabilities because no interaction across systems could enable the agenda. This situation would also be similar in the schools across the country. Now, because systems such as curriculum and infrastructure have been revised and redesigned, respectively, possibilities are emerging for inclusivity within the college. This situation also leads to another new learning opportunity about the interrelatedness of the SDGs. The infrastructure issues fall under SDG9 yet intersect with others such as SDG4 (quality education) and SDG10 (reduced inequalities). Thus, this new learning opportunity resonates with the interrelatedness of the bioecological systems in Bronfenbrenner's PPCT model.

7.3.4 ECOT case used the achieved capabilities for teacher training

Actual developmental levels (ADLs) were evident in the areas the participants suggested needed strengthening for the mainstreaming agenda via ESD, including mindset change, infrastructure, industrial experience, professional development, leadership, collaboration and teamwork, as detailed below.

Mindset change: There is a need to change mindsets about the perceptions and attitudes towards disabilities and sustainability issues, as captured below:

EI1: We should change. Some people are just in the system and want things to stay as they are, whereas the world is not standing still.

EI3: One of the things that is needed to deal with our perceptions to deal with how we do things, how we are supposed to do things or maybe how other people do things differently.

EI2: Attitudinal mostly concerns the mindset of the people around. For instance, when we are referring to or when we involve persons with disabilities, there are many attitudes that they are given around training institutions.

EWA&B: We need to focus on eradicating attitudinal barriers, as it needs continuous capacitation.

EWE&G: We need to change our mindset and start accepting more students with different disabilities.

Infrastructure: This is a key factor in mainstreaming inclusive education in teacher education via ESD, as one interview participants shared:

EI2: The physical aspect posits a huge barrier, more especially to persons with disabilities, because the infrastructure is not conducive for them to manoeuvre around to do things on their own. It can be structured, it can be in extracurricular activities, sports so on and so forth.

Industrial experience: This was identified as one of the supporting systems needed to bring out or encourage issues of inclusion in teacher education via ESD, as captured below:

EI1: Some of the courses can never be learnt theoretically, so we need support, even if the government does not have money but we need the industry to be able to assist us in sustaining some of these courses because we are banking on those industries that they are the ones who need the skills.

Professional development: This is needed to strengthen inclusive education in teacher education via ESD praxis, as shared below:

EI2: We need further professional development, that is, further training because as we deal with various groups of individuals, we need to handle them around the institution and in the classroom environment.

Leadership: The support from leadership in the context of mainstreaming inclusive education in teacher education via ESD is crucial. Some of the interview participants said:

EI3: The support that we need number one, of course, is leadership; this thing is important, and therefore, we need to be supported everywhere possible.

EI2: The mindset of the leadership also needs to change and be aligned with sustainability or sustainability issues so that they can understand well and give full support where needed.

Collaboration and teamwork: These were also identified as crucial in the mainstreaming agenda, as shared during the co-engagement with the participants through the interviews:

EI3: Agreeing with collaborating partners, or partners that are to collaborate, that indeed this should be the way that we go, for if we agree, the support becomes easier. Let us agree on how we move forward and make inclusive practicable in our place.

EI1: I talked about teamwork. I learnt that you cannot work alone in isolation, and I have learnt that just to be me being just an educator is not enough but I also have to; I always have to change. My thinking is I want to change regardless of what the change is in the world but make it always interesting, especially for my students and for myself, because many factors demotivate us, but you are always an educator you cannot afford to be demotivated because the students are going to follow suit.

In the *Vusetela* ESD Change Project, I presupposed that teacher educators possess specific ADL capabilities from their experiences before and during the SST programme. For instance, these educators have grappled with issues related to ESD within teacher education curricula, serving as an illustrative instance of ADL. During the formative intervention, the emphasis was on inclusivity as the unit of analysis for this study and teacher education as the element that needed more support in the ESD Change Project. The teacher educators asserted that the abovementioned themes would actualise and strengthen the mainstreaming process. Their conviction lay in the belief that implementing accessible infrastructure would enhance the inclusivity of pre-service teachers with disabilities. These insights and capabilities were attained through social interactions within the *Vusetela* ESD Change Project.

Consequently, as a formative interventionist researcher, I used these tangible cognitive skills as a foundation to further engage them in *expanding* their learning. This support is in line with the theoretical argument that at ADL, the participants' "mental functions ... [have] been established as a result of certain already *completed* development cycles" (Vygotsky, 1978, p. 85, original emphasis). To me, such completed developmental cycles are areas the participants said needed strengthening, such as mindset change and leadership. They experienced them and cognitively and concretely knew how they could be renegotiated for inclusivity. Nevertheless, in line with Vygotsky's perspective, I posit that teacher educators can further develop learning regarding their practices beyond the ADL, hence our navigation through the ZPD.

7.3.5 Potential capabilities may inform teacher training in ECOT case

Areas that the participants said needed strengthening were their achieved capabilities. Since I engaged them in the ZPD processes, I could support them through what was in the "course of maturing" or what was not already there. This support determined the strategies for mainstreaming inclusive education in teacher education through ESD, including curriculum transformation, leadership mobilisation, and engagement with the wider community. These strategies are elaborated below.

Curriculum transformation: This is one key strategy for mainstreaming inclusive education in teacher education via ESD, as captured below:

E11: We learnt that somehow, even our curriculum must involve it, even if it is just having it as a module, even if it is just like a non-examinable supporting module. It will always bring it into perspective whereby we can always know that we are here, but you must be learning to survive in the communities and change the communities. So, whatever we do as they do in other colleges, even if it is just not examinable, they will be empowered.

I asked the participants how curriculum transformation would be a strategy for mainstreaming inclusive education in teacher education via ESD. The responses show that through curriculum transformation, sustainability education empowers learners with disabilities. The extract below is representative of the responses and links with the above quotation:

E11: The people in the industry also inculcate them to say do not discriminate against disability. So having said that, besides that, even if they do not get employed, to me, sustainable education is telling me that in as much as you are crying that there is unemployment, sustainable education is a solution in the sense that we must empower them whether employed or not. However, they

must be able to go and change the communities, whatever communities, with the skills they gained as a strategy to survive.

Leadership mobilisation: This is crucial in the mainstreaming process, as shared in one of the interviews:

EI2: Mobilising mainly the administrators because they say everything rises and falls at leadership. Nothing can happen on the ground if our leaders are not into this thing.

Through leadership mobilisation, teachers will be empowered to transform towards inclusivity, as shared below:

EI1: There must be some way of sensitising what this is all about because even our bosses cannot. They were just here to buy time, so even attending the webinars, you would find that you were not even given adequate time because they needed to see it as a priority. They just thought, you know, only when they saw how serious you guys are following it up.

EI2: Leaders are the ones who can be able to mobilise the whole of the staff if it starts with them. It says sustainability starts with teachers. Yes, I might have it as a teacher, but I also need support from those above me.

Engagement with the wider community: This forms part of the process of support strategies capable of bringing out or encouraging issues of inclusion in teacher education through ESD programmes, as captured below:

EI3: Engagements will be one of the ways that I can use, with those students, with those teachers and with those colleagues.

EI2: So, I encourage my colleagues and any other educator who want to join SST because it is very enlightening, and it is very beneficial to many, not to you as an individual alone.

EI1: Having talks, having seminars is important. You know, sometimes we, as trainers, are more concerned with curriculum such that the important things we end up not emphasising.

EWD: As an SST team, we have limitations in knowledge of how certain things are supposed to be done, so when all the stakeholders are there, we believe that it is the roadmap of all the solutions that will be coming up. Some will fall squarely on the SST team, and the SST team will take the lead in providing those solutions. Some will fall squarely on department heads, and the department heads will take the lead in discussing how that particular challenge can be solved. Some will fall squarely on the administration, on the ministry, others on other stakeholders, but when we are together, it is there that we will have a roadmap for all the challenges. Then, from there, everyone will take the challenges in trying to provide the solutions, but we know that we would have looked at the challenges and the possible solutions. Open how if it is financial

challenges, we will have an institutional board member on how these challenges will be solved. If it is reserved for the SST team, you may find that other role players still need to be there, and the SST team still has to go somewhere within the institution to present the same things. So, if everyone is there and they know this is happening, these are the solutions we agreed on. It takes a very short time. We are doing this in the SST team; we ask you to sign this letter; there are no further questions; you know they understand very well, so if they do not understand like I am seeing things happening right now, you will find that this particular officer that you are presenting this thing to is the main person through which probably certain documentation has to pass through if they do not understand they will shove it there so the whole thing is stuck.

Engagement with the wider community would help in monitoring and evaluating the implementation of inclusivity via ESD:

EI3: In ESD, I have learnt that, especially when you do the Change Project, whatever you do, you must be able to, at the end of it all, come back to see at the very beginning what it is that I had started to do, have I done it, how best can I improve it.

The *Vusetela* ESD Change Project centred on the imperative for increased support to strengthen the teacher education dimension in renovating infrastructure for inclusivity. This emphasis led to integrating Vygotsky's ZPD. Vygotsky's theory addresses the disparity between an individual's current stage of development, determined by independent problem solving, and the potential stage of development, achieved through problem solving with the guidance of adults or more proficient peers. Similar to my role in the Malawi and Tanzania case studies, I assumed the "adult guidance" position as an insider formative interventionist researcher.

Concurrently, other teacher educators, particularly those acquainted with the Change Project and who had completed the SST online course, took on the role of more proficient peers. Collectively, we provided mutual support to enhance the teacher educators' existing accomplishments (referred to as the ADL) through the ZPD to expand our capabilities. This expanded learning equipped teacher educators with strategies to bolster the teacher education dimension for inclusivity via ESD. In the scope of this study, the participants are still in the learning phase of these potential capabilities. Once they achieve these aspirations, the strategies would turn into ADL, and the participants would need to be supported or support themselves to move up to other higher-order potential capabilities. Therefore, I set up a learning model for the participants to navigate their limitless potential.

7.3.6 Time dimensions can track the transformation of teacher training in the ECOT case

The study was interested in the temporal interactive systems in *Vusetela's* ESD activities in the teacher educators' inclusivity practices. In this regard, the study was interested in how teacher educators can monitor and evaluate whether their teacher education programmes include and promote inclusive education concerns over time. Firstly, participants shared the relevance of monitoring and evaluating whether their teacher education programmes, in the ESD context, are preparing student teachers' competence in inclusive education, as captured from workshop pairs:

Traces progress and funding (EWA&B): I think it is very important to monitor anything and everything that you do as a project so that you know where you are and then what steps to take to get somewhere and even if you have gotten at whatever level that you had set yourself then you will have to maintain. Hence, through monitoring, you will be able to gauge where you are and to know whether you are failing or still rising. You need to monitor, so like every other project, you need to monitor because I would say that if there will be stakeholders that will pump in money like my colleague was saying that funding is needed here, it is through monitoring that you will be able to give feedback to all stakeholders that may have helped here so all those reports may come from the monitoring process.

Gives direction (EWC&D): If you do not know where you are going, you are not lost, but when you know where you are going, you are lost. In this case, we know where we are going, and we are lost, so we must keep on monitoring to check if we are ever achieving what we intend to achieve because we want to reach somewhere we intend to reach, but we can only reach that particular place if we keep on checking if we are on the right path.

Facilitates collective agency (EWE&F): It is important to monitor so that you know exactly where you are, where you are going and what you want to accomplish at the end of the day. Furthermore, monitoring will also avoid the issue of an individual taking ownership of that project. It becomes my business, my way or the highway. When we monitor, everybody will know what is going on and what needs to improve, when and how instead of relying on one person who has taken over in monitoring will give us direction as a unit rather than an individual.

Secondly, the participants suggested ways to monitor and evaluate inclusive education in teacher education programmes in the ESD context, including tracer studies, assessment, capacity building and feedback tools. Below are the details of the emerging themes from the data.

Tracer studies: These can help monitor and evaluate inclusive education in teacher education in the ESD context, as reported below:

EI1: Follow up with the students, follow up with graduates and develop a strategy for evaluating them.

EI2: Follow-ups on students while in the industry, like an internship, we have to keep checking and progress checks of the students even after employment.

Assessments: This was positioned as one strategy for the mainstreaming agenda via monitoring and evaluation, as captured below:

EI3: The aspect of putting it into the curriculum is so that you know it can also be something that the expectation will be like you can do assessments on it. You were so encouraging to complete projects, so you can also complete these as student assignments.

EWA&B: We think on assessments there should be some aspects of inclusivity that may be a project and examinations of some sort, or on another note may be the inclusivity, maybe in every department, there should be a subject that will consist of inclusiveness so that everybody is capacitated, both lecturers and students.

Capacity building: There is a need for capacity building for teacher educators as one way of monitoring and evaluating inclusive education in teacher education across ESD contexts, as shared during the workshop discussions:

EWC: Making sure that all staff members, especially educators, are well capacitated, i.e., in sign language, to make sure that students receive a quality education in their respective fields for those who have those challenges or physical barriers. Students also need to present using sign language and be able to present their thesis or assignments wherever necessary in that form of language. Moreover, the lecturers will be bound to produce audio and presentation slides with audio to enable students who are blind or those who are partially deaf as well. The audio or the slides should be sent to the students a day before so that they can listen or for those who are deaf to read them for easy presentation the following day.

EWB: We are talking about attitudinal barriers. Those are social challenges and attitudinal barriers. They call for constant capacitation of staff and everyone around this institution; students and administration. That also needs money because when you are calling people to sit together around and discuss, you need to give them food, you see everything of that sort, you need to transport facilitators or pay them or give them something as a motivation, so money is the key factor here. So, if there can be a proposal seeking funding to facilitate this whole project, most of the challenges can be eradicated.

EWE: It would be a stepping stone towards redirecting the government and possibly the Ministry of Education and all other ministries that even as much as you are qualified in a certain profession, you will need a certain skill or a certain ability to communicate, say for sign language with the public than in that way we will be offering sign language in a certain profession be it construction, be it teaching, be it law or be it motor mechanics so that whenever you have a client who has a

challenge in any aspect of physical disability you can converse and also communicate to that person appropriately.

Feedback tool: One way for monitoring and evaluating inclusive education in teacher education in the ESD context is to come up with a feedback tool. This suggestion came out of workshop pair work and discussions, as captured below:

EWE&F: For us as a way of monitoring, we thought of the feedback tool that may have to be made available. In this tool there should be feedback from students where they can write since we will have enrolled students who fall squarely on inclusiveness so we should get feedback from them, how do they feel about the inclusiveness in the college, and also feedback from lecturers themselves and non-academic staff since they are the ones also that are role players. There should also be feedback coming from other stakeholders.

EWA&B: Since we spoke of regulations at some point, in these regulations it should be there on how this feedback is going to be brought forward maybe at the end of the academic year or whatever time but this feedback has to be done and it should be made available to the academic board which is the heads of departments whether you meet the administration and the team itself so that then this can be an institutional thing and it goes back to all staff and the students once we have the direction.

EWC&G: I think of this one amongst ourselves who have initiated all this and maybe learnt and may be taught about it. We will have to maybe set up within ourselves a committee that will be looking at these facilities whether they are still in good shape and whether they are still maybe, where they are required, they have to be there and maybe in the long run even see what else what other developments can be done to make, to improve them, so that if anyone comes around and say the rump is no more required there, he has to go through that committee or those people who were there when it was initiated.

This study engaged with Bronfenbrenner's PPCT model partly because it has a monitoring and evaluation tool that could track inclusivity issues in teacher education in the context of ESD. This tool manifests in the time dimensions in the Time component of the model and more explicitly in the Chronosystem of the bioecological systems (the Context component). In the context of this study, the ESD intentions, the SST objectives and the SDG4 (Target 4.7.) indicators formed part of the Chronosystem. Thus, the participants' monitoring and evaluation strategies speak to the temporal impacts on such goals. However, for the strategies to be meaningful, indicators must be set for monitoring and evaluation. Much as I took the participants through Vygotsky's ZPD to develop these indicators, they did not come out explicitly in the case of the *Vusetela* ESD Change Project in Eswatini compared to the case of *Tubadilike* ESD Change Project in Tanzania. Nonetheless, this is not strange or a study limitation if one understands Vygotsky's work deeply. No matter how much support is

rendered to a developing person, there are some levels that they cannot outwardly reach. I take the issue of indicators as that situation. Thus, the strategies the participants offered for monitoring and evaluation are more ADL for moving through my own ZPD as a formative interventionist researcher to develop those indicators explicitly in the next chapter.

The *Vusetela* ESD Change Project presented above can be summarised in Bronfenbrenner's theoretical framework as shown in Figure 7.9 below.

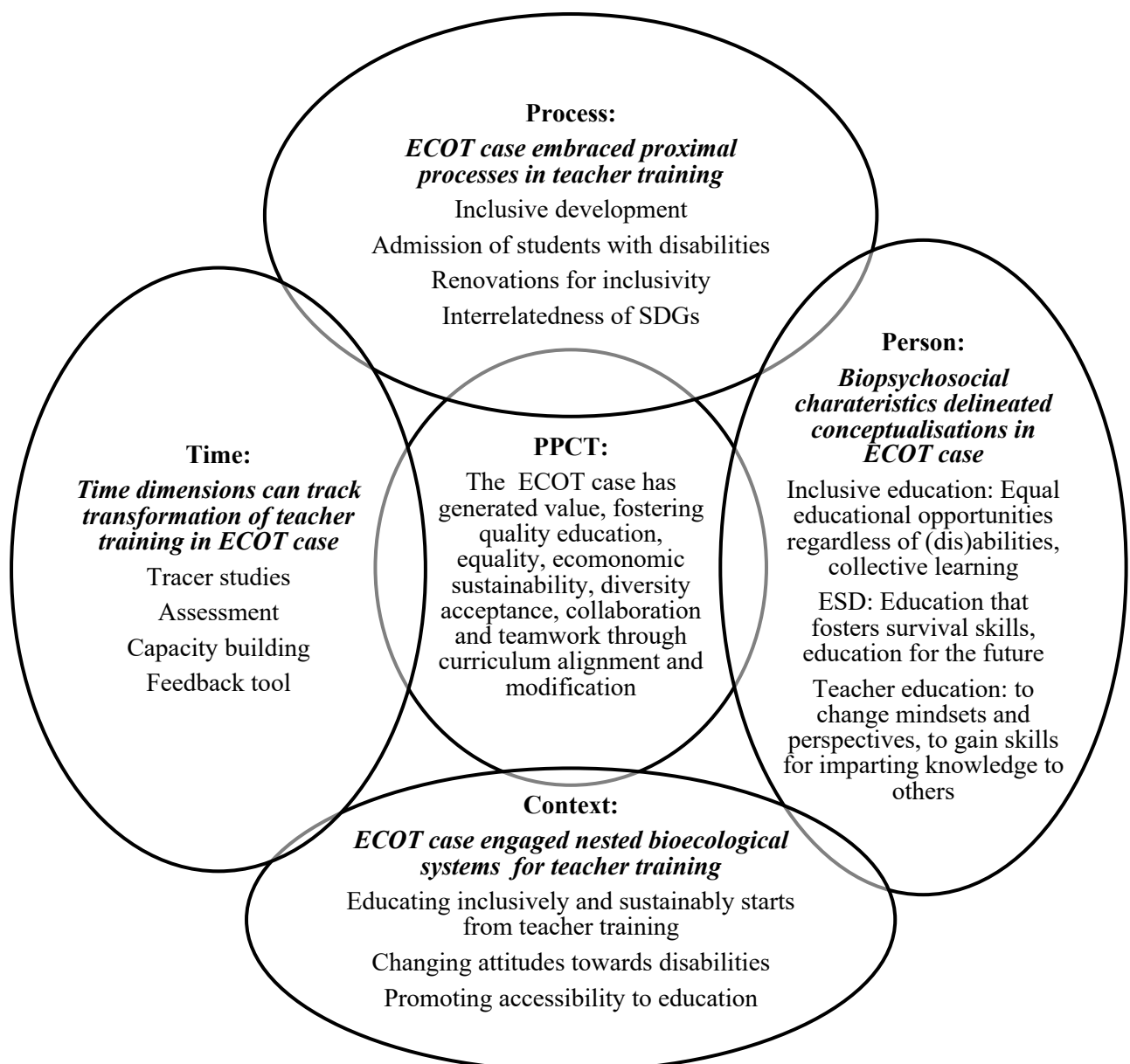


Figure 7.9: Bronfenbrennerian summary of ECOT case

The ECOT Change Project can also be summarised in Vygotskian framework as shown in Figure 7.10 below.

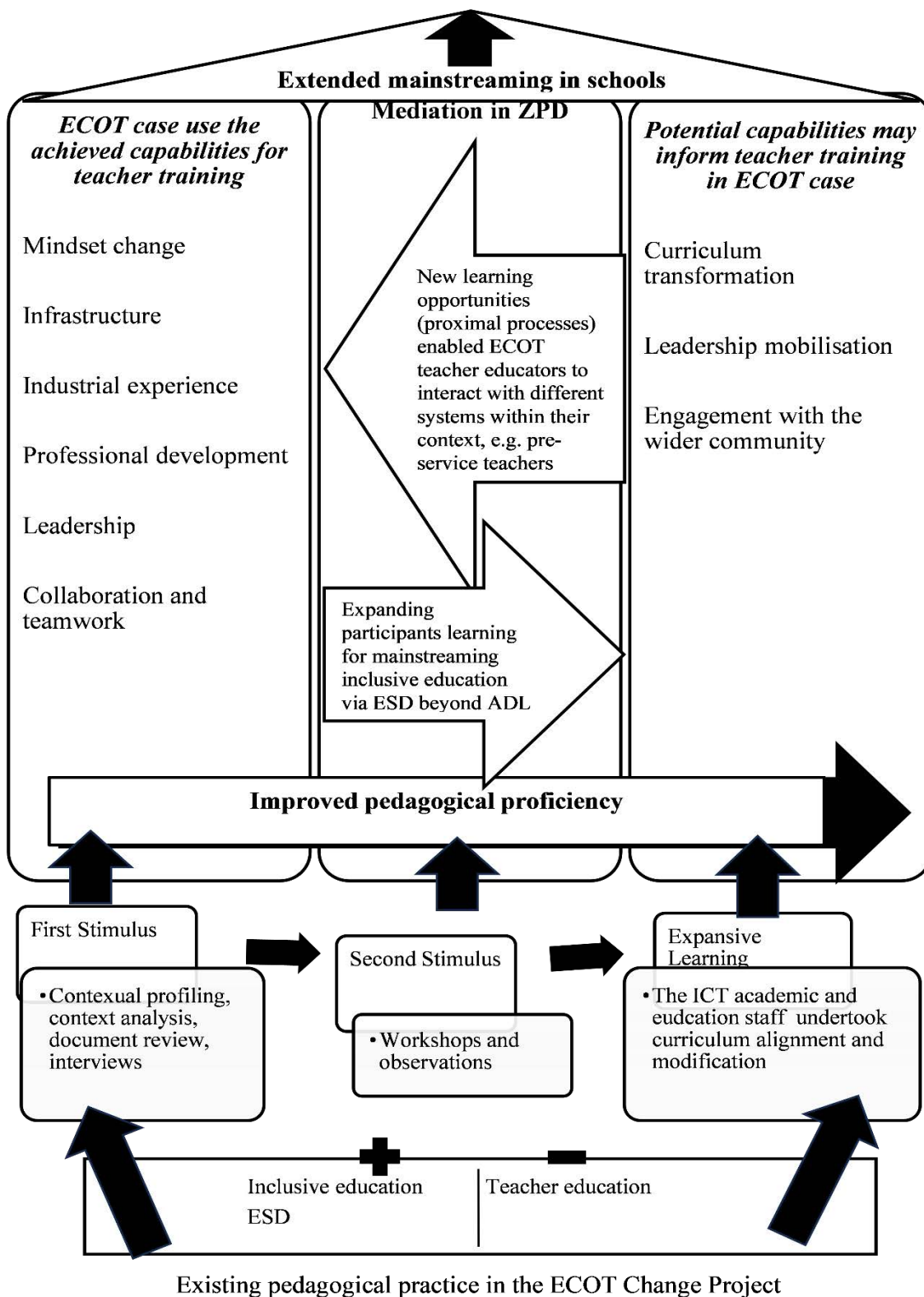


Figure 7.10: Vygotskian summary of ECOT case

7.4 Conclusion

The focus of this seventh chapter was the case analysis of the *Vusetela* Change Project at ECOT in Eswatini. Adopting a formative interventionist approach in this case study, the goal was not to introduce new concerns to the communities of practice but rather to support the existing initiatives. Consequently, this chapter outlined the research processes conducted with SST participants at ECOT where teacher education needed more support while maintaining inclusivity as the unit of analysis in the ESD praxis.

CHAPTER 8

MECHANISMS FOR ACTUALISING INCLUSIVE PEDAGOGICAL PROFICIENCY

8.1 Introduction

This eighth chapter discusses the emerging regional knowledge on mainstreaming inclusive education in teacher education via ESD in Southern Africa. The discussion engages the literature review insights and the cross-country findings from Malawi, Tanzania and Eswatini. As indicated in Chapter 1, this study worked with three notions: inclusive education, ESD and teacher education while surfacing pedagogical proficiency. In tandem with the principles of formative interventionist research, the focus in the cases was on the areas the participants requested to be supported. Thus, in Malawi's case, the formative interventionist research focused on the inclusivity aspect (Chapter 5). In the Tanzania case, the support focused on the sustainability aspect (Chapter 6). In the Eswatini case, the formative intervention supported the teacher training aspect (Chapter 7). Thus, much as the study had a focal notion in each country, the three notions were continuously interactive. For example, by supporting inclusivity in the Malawi case, the study consequently supported sustainability and teacher training aspects.

The chapter also discusses the implications of the research findings from investigating the mainstreaming of inclusive education in teacher education in the context of ESD. This endeavour is undertaken through a critical realist philosophical analysis. Based on the abductive analysis from the last three chapters (see Figures 5.7 and 5.8 for PETTC, Figures 6.4 and 6.5 for DUCE and Figures 7.9 and 7.10 for ECOT), this chapter proposes and motivates the Sustainable Inclusive Pedagogical Proficiency Process (SIP3) model. The SIP3 model may enable further research to capacitate teacher educators to orient pre-service teachers towards inclusivity, in which understandings of inclusive education are grounded in sustainability principles, areas needing strengthening are checked, strategies for mainstreaming are promoted, and monitoring and evaluation are done. Furthermore, the chapter offers suggestions for change and further research. The chapter also motivates why the future dimensions of inclusive education in teacher education in the ESD context may be more proficient if researched in process models such as the SIP3 model, which manifests in sustainability, human development and learning. Table 8.1 below summarises the literature review, research findings and analysis done in the preceding chapters which involved thematic and abductive analysis.

Table 8.1: Summary of literature review and data analysis

Research objectives and literature review findings	Analytical and inferential framework	Research findings and theoretical recontextualisation		
		Malawi – PETTC case	Tanzania – DUCE case	Eswatini – ECOT case
<p>Objective 1</p> <p>To develop understandings of inclusive education and ESD in teacher education towards pedagogical proficiency in three southern African countries: Malawi, Tanzania and Eswatini.</p> <p>Literature review findings</p> <ul style="list-style-type: none"> • Co-engaged process of transformation • Precursors of quality education • Determiners of policies and practices 	<p>Thematic data analysis:</p> <ul style="list-style-type: none"> • Conceptualisation of inclusive education 	Education for all, twin-track system	Equal opportunities, inclusive needs, teaching approach	Equal opportunities, collective learning
	<p>Thematic data analysis:</p> <ul style="list-style-type: none"> • Conceptualisation of Education for Sustainable Development (ESD) 	Curriculum for sustainable development, empowerment and transformation	Survival and adaptation to changes, responsible living and use of resources, sustainable development in teaching and learning	Fostering survival skills, education for the future
	<p>Thematic data analysis:</p> <ul style="list-style-type: none"> • Conceptualisation of teacher education 	Partnership system, process of professionalism	Training of trainers, teaching skills, mentorship torch	Changing mindsets and perspectives, skills for imparting knowledge
	<p>Abductive inference:</p> <ul style="list-style-type: none"> • Person component 	Biopsychosocial characteristics for inclusivity	Biopsychosocial characteristics for sustainability	Biopsychosocial characteristics for teacher training

<p>Objective 2:</p> <p>To identify areas that need strengthening for teacher educators to mainstream inclusive education in teacher education for pedagogical proficiency through ESD.</p> <p>Literature review findings</p>	<p>Thematic data analysis:</p> <ul style="list-style-type: none"> • Essence of inclusive education 	<p>Mainstreaming in regular schools, removing cultural barriers, promoting community participation, influencing change</p>	<p>Teacher as a driver of knowledge on sustainable development, inclusive education fosters sustainable development, the power to change others, balancing disability support and independent living, supporting the need for inclusivity</p>	<p>Inclusive and sustainable education in teacher training, changing attitudes towards disabilities, promoting accessibility to education</p>
<ul style="list-style-type: none"> • Global North ideologies • Competencies and agency • Teaching models • Legislation and regulation • Teacher professional development • Assessment 	<p>Thematic data analysis:</p> <ul style="list-style-type: none"> • New learning opportunities 	<p>Using locally available resources for teaching/learning, producing teaching/learning aids from waste, sharing ideas and interactions, resonance with curriculum, collaborative learning</p>	<p>Thinking big – starting small, disability and independent life, improved perspectives on disabilities, incorporating sustainability in teacher education, ESD in all spheres of life, collaboration, indigenous knowledge and past innovations, experiential learning</p>	<p>Inclusive development, admission of students with disabilities, renovations for inclusivity, interrelatedness of Sustainable Development Goals (SDGs)</p>

	<p>Thematic data analysis:</p> <ul style="list-style-type: none"> • Areas needing strengthening 	<p>Incapacitation due to physical disability, areas and structures of teacher education curriculum, teacher training institute for inclusive education, accommodating structures and expertise, teaching/learning materials and resources, monitoring inclusivity practices, funding and fundraising, community mobilisation, entrepreneurial skills, supportive leadership, knowledge and impact</p>	<p>Financing for sustainability, mindset change towards non-profit projects, cooperation and collaboration, Information and Communication Technology (ICT) gadgets and software, ICT-phobia and learning</p>	<p>Mindset change, infrastructure, industrial experience, professional development, leadership, collaboration and teamwork</p>
	<p>Abductive inference:</p> <ul style="list-style-type: none"> • Context component 	<p>Nested systems that need support to strengthen the inclusivity aspect in the Change Projects</p>	<p>Nested systems that need support to strengthen the sustainability aspect in the Change Projects</p>	<p>Nested systems that need support to strengthen the teacher training aspect in the Change Projects</p>
	<p>Abductive inference:</p> <ul style="list-style-type: none"> • Process component 	<p>Proximal processes that influence inclusivity in the Change Projects</p>	<p>Proximal processes that inform sustainability in the Change Projects</p>	<p>Proximal processes that shape teacher training in the Change Projects</p>
	<p>Abductive inference:</p> <ul style="list-style-type: none"> • Actual Developmental Level (ADL) 	<p>Achieved capabilities for strengthening the inclusivity aspect</p>	<p>Achieved capabilities for strengthening the sustainability aspect</p>	<p>Achieved capabilities for strengthening the teacher training aspect</p>

<p>Objective 3</p> <p>To co-develop, with selected teacher educators, ways to strengthen mainstreaming inclusive education in teacher education towards pedagogical proficiency via ESD.</p> <p>Literature review findings</p> <ul style="list-style-type: none"> • Teaching methods • Learning materials • Professional competencies • Resource centres • Policy environment 	<p>Thematic data analysis:</p> <ul style="list-style-type: none"> • Strategies for mainstreaming 	<p>Parental involvement, collective evaluation of teaching, networking, coordination and collaboration, curriculum implementation (concrete to abstract pedagogical trajectory, responsiveness to biopsychosocial factors, learner-centred pedagogy, varied assessment strategies), ESD framework</p>	<p>Training ICT specialists for special needs, shifting policy from content-based to competence-based, policy implementation involving students, education for self-reliance in an inclusive approach, creating champions for change, setting guidelines for inclusivity, in-service training for teacher educators, short courses on inclusive pedagogy, policy contextualisation, change-oriented intervention models, creating awareness, engaging multifaceted competencies</p>	<p>Curriculum transformation, leadership mobilisation, engagement with wider community</p>
	<p>Abductive inference:</p> <ul style="list-style-type: none"> • Zone of Proximal Development (ZPD) 	<p>Potential capabilities for mainstreaming inclusivity</p>	<p>Potential capabilities for supporting sustainability</p>	<p>Potential capabilities for orienting inclusive teacher training</p>

<p>Objective 4</p> <p>To generate indicators that can be used to monitor and evaluate inclusive education mainstreaming and inclusive pedagogical proficiency via teacher education in ESD context.</p>	<p>Thematic data analysis:</p> <ul style="list-style-type: none"> • Ways for monitoring and evaluation 	<p>Teaching practice, research, database forums, discussion forums, teaching strategies, assessment, curriculum evaluation</p>	<p>Strategic plans, framework of indicators, curriculum, policies and practice, assessment, evaluation forms, tracer studies, teaching practice</p>	<p>Tracer studies, assessment, capacity building, feedback tool</p>
<p>Literature review findings</p> <ul style="list-style-type: none"> • Policy-to-practice trajectory • Indicators framework for monitoring and evaluation 	<p>Abductive inference:</p> <ul style="list-style-type: none"> • Time component 	<p>Time determinants for monitoring and evaluating the inclusivity aspect</p>	<p>Time determinants for monitoring and evaluating the sustainability aspect</p>	<p>Time determinants for monitoring and evaluating the teacher training aspect</p>

8.2 Retroductive Analysis of Cross-case Similarities and Differences

So far, analysis of research findings has been at thematic and abductive levels. I read through the data and identified the emerging themes at the thematic level. Then, I presented these themes, accompanied by evidence through thick descriptions of the research processes and quotations from participants' responses. At the abductive level, I analysed the emergent themes from the thematic analysis using the theoretical framework of Bronfenbrenner's (2005) bioecological systems theory of human development. Some of the themes fell outside Bronfenbrenner's framework; these were analysed using Vygotsky's (1978) sociocultural theory of learning. The abductive work was guided by Engeström's expansive learning methodological trajectory. This chapter takes the analysis from the abductive to the retroductive level. In a study like this one, the data that was recontextualised by Bronfenbrenner's framework and the data that was not, where the Vygotskian framework was employed, offer valuable insights for further discussion from a critical realist philosophical perspective (Meyer & Lunnay, 2013). This chapter takes this discussion further using Roy Bhaskar's critical realism philosophy.

Collier (1994) summarised that "Roy Bhaskar has said that every philosophy is some kind of realism, but realism about what?" (p. 6). For this study, the realism lies in the ontological disposition of establishing the nexus that may exist between inclusive education, ESD and teacher education in a southern African context, with Malawi, Tanzania and Eswatini as cases. Thus, philosophically, the theoretical framework for this study (Bronfenbrenner's and Vygotsky's theories) took a critical realist perspective in navigating the nexus. According to Collier (1994), "the practical importance of theory is that a theory can transform a practice" (p. 15). Put in context, in tandem with the critical realist philosophy, this study took an expansive learning trajectory to the research process and abductive approach to data analysis. The study designated the theory as the preamble to look for potential for change in the teacher educators' practices in the three SST case studies, *Pamtondo* in Malawi, *Tubadilike* in Tanzania and *Vusetela* in Eswatini.

When applied to practice via theory, Bhaskar's philosophy is both transformative and emancipatory "in that, because it recognises that states of affairs are brought about by the working of relatively enduring structures, it directs the attention of people who want to make the world a better place to the task of transforming those structures" (Collier, 1994, p. 16). In

the context of this study, such a task entailed the mainstreaming of inclusive education in teacher education practice for pedagogical proficiency in the context of ESD. The ultimate goal is the promotion of inclusive education at all levels of education, something that can be said to be a common good for a better world.

8.2.1 Understandings of inclusive education, ESD and teacher education

In all three case studies, as found from the thematic level analysis, inclusive education is understood as a system that offers equal educational opportunities. However, in the Malawian case, inclusive education is uniquely recognised as a two-way education system; in the Tanzanian case, it is uniquely understood as a teaching approach, while in the Eswatini case, it is uniquely grounded in collective learning.

For ESD, the thematic level analysis shows that a common understanding across the three cases is the curriculum's intentions for supporting sustainable development in which people are empowered to use resources for survival responsibly. Nonetheless, in the Malawian case, there is a unique emphasis on transformation (i.e. repealing past unsustainable practices); in the Tanzanian case, there is a unique emphasis on teaching and learning for sustainability (remediating the present unsustainable practices), and in the Eswatini case, the emphasis is on the educational future (envisioning the future practices).

In teacher education, the thematic analysis shows that in all three cases, the emphasis is on developing skills for the teaching profession. Still, disparities show that in the Malawi case, teacher education is situated as a system in education, while in the Tanzania case, it is designated as a model of training and in the Eswatini case, it is delineated as a process for change.

The literature review (see Chapter 2) revealed that the understandings of the three concepts (inclusive education, ESD and teacher education) centres on the co-engaged process of transformation, precursors for quality education, and determiners of policies and practices. When connecting the results from the literature review and the research findings from the thematic analysis, it becomes apparent that process and quality cut across inclusive education, ESD and teacher education. However, there needs to be a connecting thread between the three notions. There is a more explicit nexus between inclusive education and ESD on one hand, and

ESD and teacher education on the other. A clear nexus between the three concepts is not explicit.

These similarities and differences can be understood through a critical realist philosophical analysis. As indicated in the research design (see Chapter 4 Section 4.4), this study employed the critical realism philosophy as an underlabourer to the theoretical framework of Bronfenbrenner's (2005) bioecological theory of human development and Vygotsky's (1978) sociocultural theory of learning. As Bhaskar and Danermark (2006) motivated, critical realism is a "less restrictive perspective [that offers] double greater inclusiveness" (p. 280). The cross-case similarities and differences noted above in the understandings of inclusive education, ESD and teacher education became more meaningful, because as a researcher, I was not restrictive with my conceptualisations of the three notions. I used the document review and participants' understanding as one layer of understanding and the literature review as another layer of understanding, hence the double inclusiveness:

The claim for critical realism is that it is the *ontologically least restrictive perspective*, insofar as it is maximally inclusive as to causally relevant levels of reality and additionally maximally inclusive insofar as it can accommodate the insights of other meta-theoretical perspectives. This, we have been calling the '*double inclusiveness*' of critical realism. (Bhaskar & Danermark, 2006, p. 294, original emphasis)

The study focused on teacher educators' engagement with inclusivity in supporting teacher education for pedagogical proficiency via ESD Change Projects in Malawi, Tanzania and Eswatini. In this regard, the understanding of inclusivity concerns disabilities. Thus, the study was interested in the ESD Change Projects that worked towards disability inclusion efforts in teacher education via the Sustainability Starts with Teachers (SST) programme. This approach had some implications for how I formatively interacted with the participants, who had their own understandings.

However, in all three cases, disability featured prominently as a key dimension of inclusivity in teacher education. This situation is evident from the case analysis reflected at the beginning of each of Chapters 5, 6 and 7 as part of the presentation of the research findings. Still, issues such as gender and social class also came out as part of the inclusive education framework. Adopting a critical realist ontological perspective in the study, largely based on the ideas of scholars such as Roy Bhaskar and Berth Danermark, has helped me to see the disabilities through a meta-theoretical mechanism, as illustrated in Figure 8.1 below.

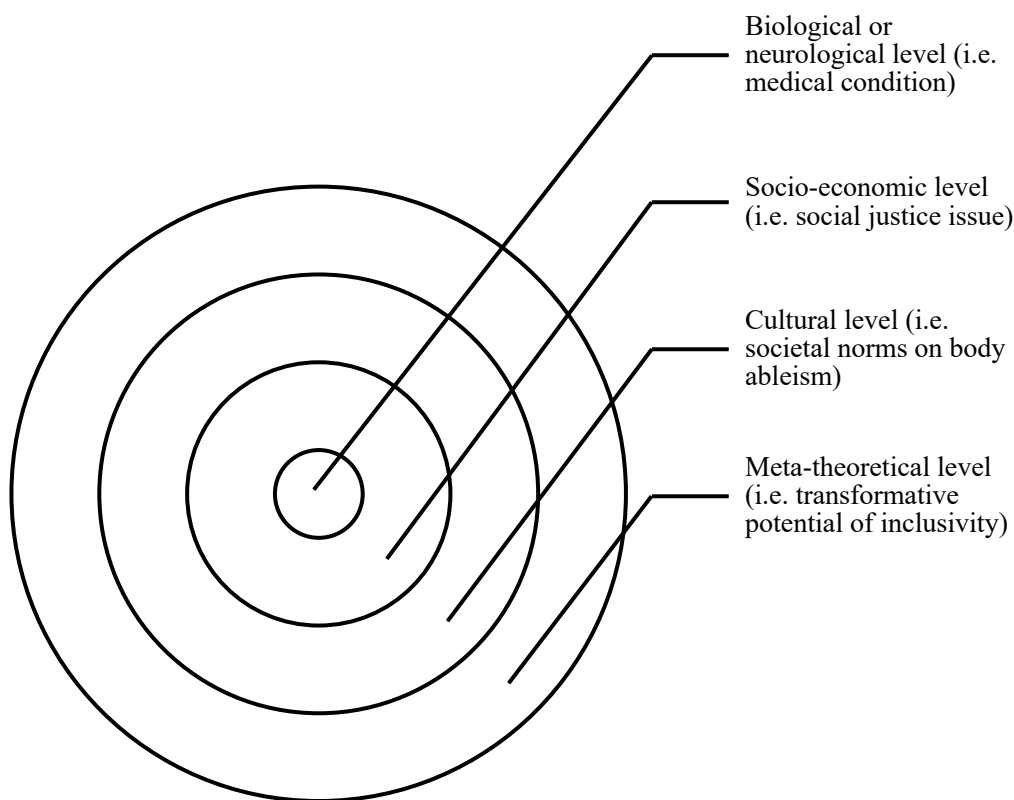


Figure 8.1: Mechanisms of disability

Figure 8.1 above shows four levels of mechanisms of disability interrogated by Bhaskar and Danermark (2006). In other words, these are the trajectories that disability perspectives have taken. These mechanisms are also dialectically related, and emergent, and recognise the laminated nature of the mechanisms and how they interact. At the biological or neurological level, disability is understood as a medical condition that needs a cure. At the socioeconomic level, disability is viewed as a social injustice issue that needs to be redressed through intervention programmes. At the cultural level, disability is understood as embedded in people’s norms towards body ableism. At the meta-theoretical level, disability is viewed holistically, thus providing more accommodating perspectives with transformative potential for inclusivity. As Bhaskar and Danermark (2006) might put it, if this study approached disability at the first level (biological or neurological), the understanding would have been limited to the medical discourse. The same would have been true at the second level (socioeconomic) to reparative discourse and the third level (cultural) to ableism discourse. Since the study approached disability at a meta-theoretical level, it could accommodate

different perspectives and cognitive constructions of the disability deduced from the policies, participants' responses and literature review.

Thus, the study focuses more on the mechanism for disability at the meta-theoretical level, which is less restrictive and doubly inclusive (Bhaskar, 2016), allowing me to interrogate inclusivity in teacher education in the context of ESD. The understandings of ESD and teacher education solicited from the documents and participants would have been irrelevant to inclusivity if this study did not work with a meta-theoretical perspective as a mechanism for disability. Again, through the meta-theoretical perspective, the study offered context-tailored formative interventionist research support in the three SST case studies (*Pamtondo* in Malawi, *Tubadilike* in Eswatini and *Vusetela* in Eswatini). As a result, the study supported inclusive education in the Malawi case, ESD in the Tanzania case and teacher education in the Eswatini case. Since the study took a critical realist ontological grounding, it was naturally bound to support the other subsystems in the cases. This approach brought me to a situation where there were three concepts as sub-units of analysis underlaboured by the inclusivity focus. In a theoretical sense, the sub-units were understood and analysed using the theoretical framework of Bronfenbrenner and Vygotsky as processes of expansive learning. However, all those sub-units are brought into a meta-understanding as an inclusive education mainstreaming agenda through the critical realist ontology, as illustrated in Figure 8.2 below.

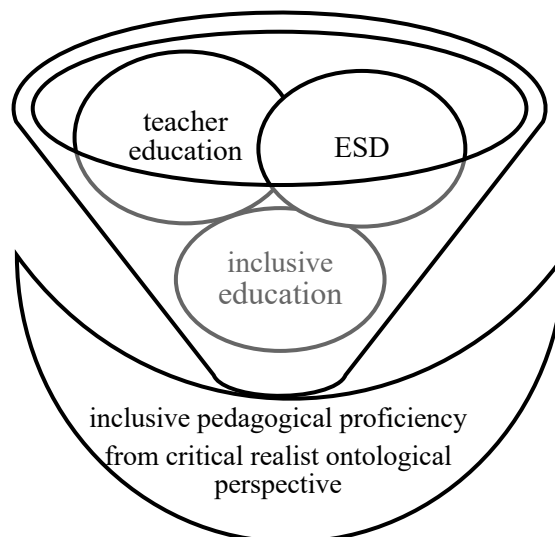


Figure 8.2: Meta-theoretical analysis

The abductive analysis for the first research question on the conceptualisations of inclusive education, ESD and teacher education showed that, in the Malawian case, biopsychosocial characteristics shape inclusive education with a unique emphasis on the double system in education, ESD with an emphasis on transformation, and teacher education with an emphasis on systems. In the Tanzanian case, the abductive analysis showed that biopsychosocial characteristics frame inclusive education with an emphasis on teaching approaches, ESD with a focus on teaching and learning, and teacher education with prominence on modelling. In the Eswatini case, biopsychosocial characteristics have been found to delineate inclusive education with an emphasis on collective learning, ESD with an emphasis on the future, and teacher education with a focus on processes.

From the meta-theoretical level of the mechanisms of disability, I argue that biopsychosocial characteristics (personal factors or features) may determine the understanding of inclusive education, ESD and teacher education in the three case studies from Malawi, Tanzania and Eswatini. These understandings may consequently shape and actualise the nexus across inclusive education, ESD and teacher education into pedagogical proficiency in Southern Africa. I shall elaborate on this argument later in this chapter.

8.2.2 Strengthening inclusive education in teacher education in the ESD context

The analysis for the second research question led to three categories of data: the essence of inclusive education in teacher education in an ESD context, the new learning opportunities from the Change Projects, and the areas needing strengthening for the mainstreaming agenda. In all three cases, there are similarities and differences between these three categories of data, as seen from the Bhaskarian critical realist perspective.

In all three cases, the category on the essentiality of inclusive education emphasises using inclusive education to influence a change in cultural barriers and attitudes towards disabilities while promoting the mainstreaming agenda that fosters sustainable development. However, in the Malawi case, a unique emphasis concerning the essence of inclusive education is on promoting community participation; in the Tanzania case, a distinct emphasis is on balancing disability support and independent living, while in the Eswatini case, a unique emphasis is on promoting accessibility to education.

For the new learning opportunities aspect, all three cases agree that the Change Projects have enabled the promotion of the use of locally available materials for teaching and learning, improved attitudes towards disabilities through interactions and sharing of ideas and are redressing environmental barriers that hinder the pre-service teachers with disabilities' interface with the curriculum and general training systems. Nonetheless, the *Pamtondo* case has a unique learning opportunity in the form of collaborative learning; the *Tubadilike* case's distinct new learning opportunity is around experiential learning, and the *Vusetela* Change Project has the interrelatedness of SDGs as its unique new learning opportunity.

In areas that need strengthening, all three cases emphasise materials and resources, mindset and attitudes change, financing and fundraising, cooperation and collaboration, and leadership. Nevertheless, the Malawi case has a unique emphasis on community mobilisation; the Tanzania case strongly emphasises ICT-phobia and learning as a connection, and the Eswatini case has a unique emphasis on infrastructure.

The literature review around this research question showed that to strengthen inclusive education in teacher education via ESD, there is a need to focus and improve on areas around competencies and agency, teaching models, legislation and regulation, teacher professional development, and assessment.

Thus far, there is complex evidence that speaks to strengthening inclusive education in teacher education for pedagogical proficiency via ESD in a southern African context, with Malawi, Tanzania and Eswatini as examples. A critical realist epistemological perspective becomes relevant to better understand what such evidence entails for the region. Bhaskar and Danermark (2006) argued that, at the epistemological level, critical realism is imperatively explanatory, suggestive and impartial. This means I can explain the evidence around the strengthening efforts because I took a critical realist perspective. Bhaskar (2016) and Schudel (2015) would contend that if I had taken non-dialectical approaches in this study, I would have merely *described* the areas that the evidence suggested needed strengthening for mainstreaming inclusive education in teacher education through ESD. The critical realist perspective has helped me to *explain* the cognitive motivations around the areas that the participants suggested, which centre on the essence of inclusive education in teacher education via ESD and the new learning opportunities from the Change Projects revealed through the Actual Developmental Level (ADL), formative intervention and Zone of Proximal Development (ZPD) in expansive

learning. See summative figures in Chapters 5, 6 and 7 – Figures 5.7 and 5.8 for PETTC, Figures 6.4 and 6.5 for DUCE and Figures 7.9 and 7.10 for ECOT).

Initially, the study did not have a specific research question on the essence of inclusive education in teacher education focusing on new learning opportunities. There was a specific research question on the areas that need strengthening to mainstream inclusive education in teacher education via ESD. Since the study adopted the critical realist perspective, I could explain what was embedded in the areas that needed strengthening efforts. I did this in a suggestive way and impartially. Bhaskar and Danermark (2006) argued:

The claim for critical realism here is that not only do other metatheories not indicate, or indicate perspicaciously, this goal, but that they fasten on other features of the phenomena which would make it impossible to get there. Thus, critical realism is not only the ontologically least restrictive perspective, but the *epistemologically most heuristically suggestive one*. (p. 295, original emphasis)

The choice to work with critical realism as an underlabourer did not mean it replaced the science of doing research (Bhaskar, 2016; Bhaskar & Danermark, 2006; Collier, 1994). In other words, critical realism offers a philosophical space for interrogating empirical evidence and literature with a more inclusive approach. Thus, in this study, the science of doing research remains Bronfenbrenner and Vygotskian theoretical framework, and Engeström's expansive learning methodological framework in the ESD Change Projects. Thus, the study uses the explanatory mechanism of critical realism to look into the similarities and differences in the cases in terms of epistemologies around strengthening inclusive education:

Epistemologically, critical realism indicates more clearly than the other positions the appropriate direction and context of explanatory research from the manifest phenomena to the mechanisms that produce them, in their complex co-determination. At the same time and largely in virtue of its clear concept of the movement of the scientific process, it is able to avoid the partiality of the other positions, which seize on one aspect (e.g., experience, interpretation) of the total research process to the exclusion of others. (Bhaskar & Danermark, 2006, p. 280)

In this regard, the epistemologies around the second research question came at three levels within the abductive analysis. The first abductive level manifested itself in Bronfenbrenner's Context component in the PPCT model. At this level, the *Pamtondo* PETTC case embraced nested systems for inclusivity, while the *Tubadilike* DUCE case employed nested systems for sustainability and the *Vusetela* ECOT case engaged nested systems for teacher training. The second abductive level manifested itself in the Process component of the PPCT model. At this

level, the *Pamtondo* SST Change Project in Malawi employed proximal processes for inclusivity, the *Tubadilike* Change Project in Tanzania used proximal processes for sustainability, and the *Vusetela* Change Project in Eswatini embraced proximal processes in teacher training. The third abductive level came through Vygotsky's ADL. At the ADL level, the Malawi case utilised achieved capabilities for inclusivity, the Tanzania case used these capabilities for sustainability, and the Eswatini case employed them for teacher training towards ZPD. Through a critical realist epistemological standpoint as an explanatory mechanism, the nature of this evidence and how the participants came up with it suggest that achieved capabilities in which nested systems and proximal processes are interactive may shape the nexus that may exist across inclusive education, ESD and teacher education. Again, I shall expound on this argument later, together with the biopsychosocial characteristics that shape the understanding of the three concepts.

8.2.3 Strategies for mainstreaming inclusive education in teacher education via ESD

For the third research question on the strategies for mainstreaming inclusive education in teacher education via ESD, (dis)parities are evident from the thematic analysis in all three cases. Strategies that cut across all the cases include curriculum implementation and transformation, policy shift and contextualisation, and interactive systems synergised into an implementation model. Still, differences are evident, with the Malawi case more prominent on engaging the ESD framework as the underlabouring process for the mainstreaming agenda, the Tanzania case more emphatic on capacity building for supportive systems such as specialists, and Eswatini more concentrated on leadership mobilisation and community engagement. The literature review suggests mainstreaming strategies such as teaching methods for training teachers, learning materials, professional competencies, resource centres, and policy environments. Understanding this multi-dynamic and complex evidence requires much criticality. Just as was the case at ontological and epistemological levels, the study employed a critical realist perspective at a methodological level to philosophically critique the process of science in investigating and supporting teacher educators in and through the ESD Change Projects in Malawi, Tanzania and Eswatini. Bhaskar and Danermark (2006) motivated that “*methodologically*, critical realism is able to move beyond both reductionism and simple non- or anti-reductionism through ontological pluralism to a positive concept of the object of disability research as (what we will call) *a necessarily laminated system*, that is, a system that refers essentially to several different levels of reality” (p. 280, original emphasis).

Bhaskar and other critical realists propound (seven) dialectically related laminated scales: sub-individual psychological, individual or biological, micro, meso, macro, mega and planetary or cosmological. These scales form part of the mechanisms for multiplicity and complexity in understanding realities and epistemologies (Bhaskar, 2016; Bhaskar & Danermark, 2006). For example, the evidence given above on the strategies for mainstreaming inclusive education in teacher education via ESD is multi-layered. Through critical realist philosophical lenses, such multi-layered evidence provides laminated explanations at levels of agency and collectivity (Bhaskar & Danermark, 2006). Schudel (2015) observed that “change depends on complex laminations” (p. 257), which is better understood from a critical realist perspective via the necessarily laminated system. Thus, the strategies this study has shown to be capable of mainstreaming inclusive education in teacher education for pedagogical proficiency via ESD can make more sense if they are methodologically embedded in the levels of agency that teacher educators interact with. This situation reminds us that education is an open system prone to transformation via agentive stakeholders such as teacher educators (Agbedahin & Lotz-Sisitka, 2019). In a necessarily laminated system, the strategies could be understood as shown in Figure 8.3 below.

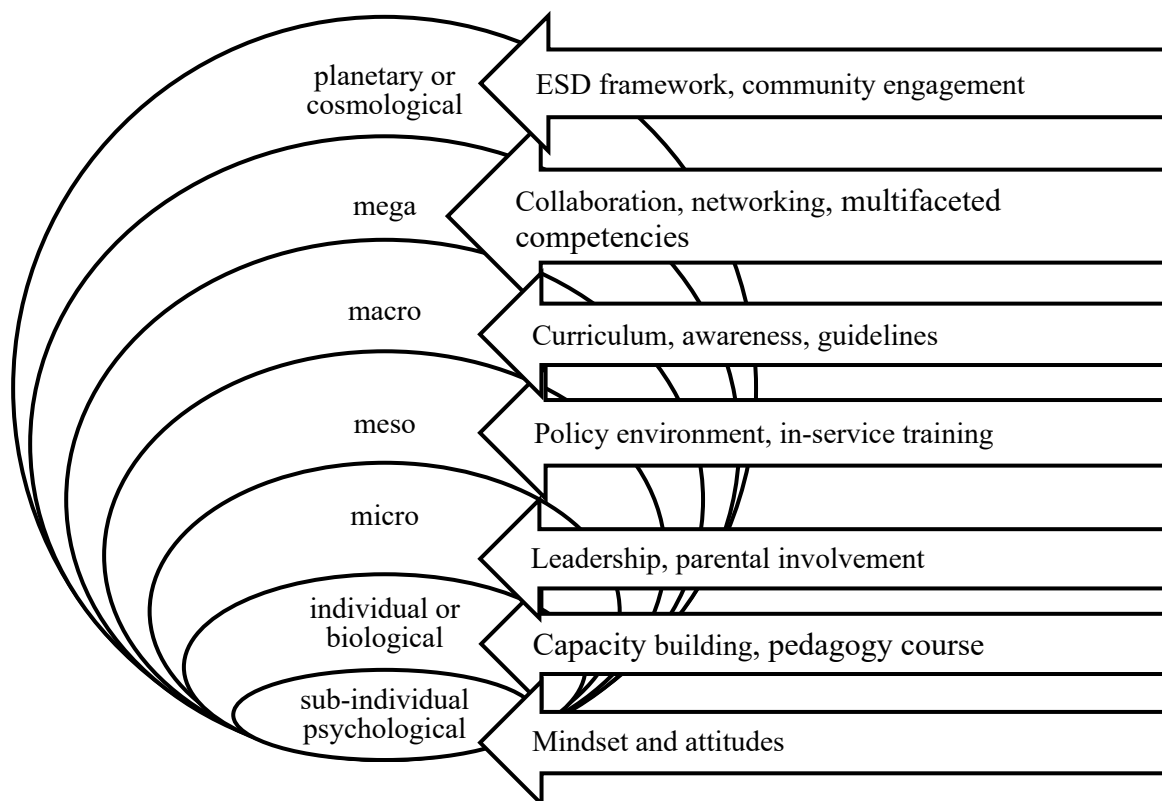


Figure 8.3: Laminated mainstreaming strategies

These Bhaskarian laminated systems speak to and under-labour the Context component in Bronfenbrenner's PPCT model, in which the bioecological systems (micro-, meso-, exo-, macro- and chrono-) profoundly influence the agency for change. Operating at a multi-scalar level as a mechanism for mainstreaming inclusive education in teacher education via ESD from a critical realist perspective, I argue that, methodologically, these strategies (see Table 8.1 and Figure 8.3) have the potential for transformation. As such, the Vygotskian ZPD model would help teacher educators move in and across the scales within and across their Change Projects, particularly aiming for the epistemologies currently out of their reach but which, with support and guidance, they could realise.

From the abductive analysis in this area, the study found that, in the Malawi case, potential capabilities (in this case, the suggested strategies) can spearhead agency for inclusivity. In the Tanzania case, these potential capabilities can support sustainability efforts. In the Eswatini case, the potential capabilities may inform and expand teacher training. Therefore, within a multi-scale mechanism, these potential capabilities (presently the participants' ZPD) can become mainstreaming strategies (then the participants' ADL). This situation has implications for how policies are formulated, practices are implemented, and research is conducted. As such, there is a need for a contextually dynamic research model to shape the policy-practice trajectory for mainstreaming inclusive education in teacher education through ESD. From a critical realist perspective, this study proposes such a model, using multi-complex evidence from formative intervention research. I explain and motivate the SIP3 model later in this chapter.

8.2.4 Monitoring and evaluating inclusivity in teacher education across ESD contexts

In all three cases, the consensus is that inclusive education in teacher education in an ESD context could be monitored and evaluated through teaching practice, assessment, feedback tools and forums, and curriculum implementation and evaluation. However, in the Malawi case, a unique emphasis is placed on research and teaching strategies, while in the Tanzania case, prominent emphasis is on strategic plans and indicators framework, and in the Eswatini case, the emphasis is on capacity building. The literature review emphasises a policy-to-practice trajectory and indicators framework as efforts to monitor and evaluate inclusive education in teacher education across ESD contexts.

Employing a critical realist philosophy to explain the above suggestions, we see much emphasis on the dimensions of temporality (time). Critical realism recognises the essence of temporality in agency and transformation (Bhaskar, 2016; Collier, 1994). Thus, through this perspective, the study sought to determine the practicalities of monitoring and evaluating inclusive education in teacher education practice across ESD contexts. The dimensions of temporality as a mechanism in critical realism speak to Bronfenbrenner's Time component in the PPCT model.

From the abductive analysis, the evidence of research shows that the Time component manifested in the Malawi case to track the progress of inclusivity, in the Tanzania case to track the initiation of sustainability, and in the Eswatini case to expand teacher training. This theoretical situation can be recontextualised in the 2020 PEER profiles for many southern African countries (see Chapter 2 Table 2.1), which show that indicators for monitoring inclusive education are underdeveloped. Thus, this study uses the temporality dimension to propose indicators for monitoring inclusivity in teacher education practice across ESD contexts. This effort is undertaken later in the chapter.

8.3 The Nexus of Inclusive Education, ESD and Teacher Education

The notion of inclusive education has made different systems reconsider how to approach education in general (Slee, 2011). Many scholars and educational reports, including the 2020 Global Education Monitoring (GEM) report, have argued that teacher education is a prerequisite for the kind of education that a country may idealise. Teacher education shapes the pedagogical proficiencies of teachers who, in return, support learners in developing cognitive abilities and relevant competencies (Lotz-Sisitka et al., 2022). Thus, if there is an aspiration to make education inclusive, it logically suggests that teacher education should be a key starting point. However, there seems to be a lack of a nexus that would put in place mechanisms for advancing inclusivity in teacher education in Southern Africa.

As such, this study explored how the ESD framework, especially the concept of a Change Project, can advance inclusivity in teacher education. This research was done through the SST programme in Malawi (PETTC – *Pamtondo*), Tanzania (DUCE – *Tubadilike*) and Eswatini (ECOT – *Vusetela*) as reported in Chapters 5, 6 and 7 respectively. The SST teacher educators worked with ESD strategies, such as community of practice, whole institution approach and

co-learning, that could be augmented for developing inclusive pedagogical proficiency. Therefore, I argue that the ESD strategies present viable trajectories for reshaping the future of teacher education towards inclusivity in Southern Africa. However, this endeavour has to be implemented in the context of the region's educational realities, such as the lack of inclusive teaching and learning resources – ESD is potentially a viable platform to reorient the educational arena towards inclusivity (for example, recycling waste materials for inclusive teaching and learning), with teacher education as a stepping stone towards the ultimate goal.

Thus, in the context of the formative intervention research with SST teacher educators at Phalombe Teacher Training College (PETTC), Dar es Salaam University College of Education (DUCE) and Eswatini College of Technology (ECOT), inclusive education may be mainstreamed in teacher education via ESD practices if the nexus between the three notions is reframed by and grounded in bioecological human development, sociocultural learning realities and an inclusive meta-theoretical view of disability. The relationship between inclusive education, ESD and teacher education in the context of the three institutions and countries is two-fold. Firstly, biopsychosocial characteristics may determine the understanding of inclusive education, ESD and teacher education. Secondly, achieved capabilities in which nested systems and proximal processes are interactive may shape the nexus that may exist across the three notions in the context of this study.

Biopsychosocial characteristics refer to cognitive constructions that policy documents and teacher educators make around the three notions. O'Donoghue and Roncevic (2020) observed that inclusive education and ESD are understood as co-engaged processes of transformation. There is also an argument that inclusive education (Simui, 2022) and ESD (Agbedahin, 2019) are precursors to quality education. Again, inclusive education and ESD have also been identified as determiners of policies and practices (O'Donoghue et al., 2018). These observations and arguments were made in the context of Southern Africa, but they do not include teacher education. Thus, the nexus across the three notions in a southern African context is weak in the teacher education aspect. This study found that biopsychosocial characteristics are crucial in fostering inclusivity (as was the case with the PETTC case), sustainability (DUCE case) and teacher training (ECOT case). Therefore, the nexus across inclusive education, ESD and teacher education lie in a co-engaged process of transformation in which biopsychosocial characteristics determine policies and practices for inclusive pedagogical proficiency towards sustainable, quality education.

Achieved capabilities include the knowledge that teacher educators have constructed through the SST Change Projects which worked in inclusive education, ESD and teacher education. It is these achieved capabilities that can be used to strengthen the co-engaged process of transformation in which biopsychosocial characteristics determine policies and practices for inclusive pedagogical proficiency towards the sustainable, quality education mentioned earlier.

Research has shown that there is a need to work around several factors for strengthening purposes, including Global North ideologies (Muthukrishna & Engelbrecht, 2018), competencies and agency for learning (O'Donoghue & Roncevic, 2020), teaching models (O'Donoghue et al., 2020; O'Donoghue et al., 2021), legislation and regulation (de Souza, 2020), teacher professional development (DeLuca, 2012; Lotz-Sisitka, 2011), and assessment (Beaton et al., 2021; Shumba et al., 2021). Nevertheless, strengthening the areas mentioned in Chapter 2 (Section 2.4) does not clearly explain how these would shape the nexus between inclusive education, ESD and teacher education. Evidence from this study suggests that if the achieved capabilities are fostered in nested systems and via proximal processes, the factors mentioned in Chapter 2 (Section 2.4) may contribute to the nexus across the three notions. Therefore, in the context of the three cases, the relationship between inclusive education, ESD and teacher education can start with using the knowledge that teacher educators gained from their practices to expand their learning spheres. Then, the relationship may manifest in considering the biopsychosocial characteristics that facilitate the achieved capabilities of teacher educators working in nested systems through proximal processes, where the mainstreaming agenda is approached as a human development and learning process.

8.4 Indicators for Monitoring and Evaluating Inclusive Education

The Tanzanian National Strategy for Inclusive Education (2021–2026) made a very interesting point concerning monitoring and evaluating inclusive education in the country's educational systems. Firstly, the Strategy recognised that monitoring and evaluating inclusive education is at two levels (Tanzania. Ministry of Education, Science and Technology, 2021). The first level is the monitoring and evaluation of the implementation of the Strategy itself. The second level is the monitoring and evaluation of inclusive education in practice. Secondly, the Strategy observed that usually, the monitoring and evaluation of policy frameworks like itself is done, but the monitoring and evaluation of inclusive education in practice is hardly done (Tanzania. Ministry of Education, Science and Technology, 2021). By inclusive education in practice, I

refer to the actual implementation of inclusive practices in schools or teacher education institutions via pedagogical activities that encourage equal educational opportunities regardless of factors such as disabilities. The 2020 GEM report through the PEER profiles found that most southern African countries, including Malawi, Tanzania and Eswatini, lack indicators for monitoring and evaluating inclusive education in practice. For this study, the monitoring and evaluation of inclusive education in practice is problematic because of the shortfall that the PEER profiles exposed, that is the lack of indicators (see Chapter 2 Table 2.1).

Up to this point, this chapter has explained how a relationship between inclusive education, ESD and teacher education could look in a southern African context using evidence from the three case studies in Malawi (PETTC), Tanzania (DUCE) and Eswatini (ECOT). This study solicited ways for monitoring and evaluating inclusive education in teacher education in the ESD context from the SST teacher educators in the three case studies. Thus, the evidence used to suggest indicators for monitoring and evaluating inclusive education in practice is concretely from the ESD context of teacher education praxis via the SST programme in the three institutions. However, from the Bhaskarian critical realist philosophical perspective, such indicators may be applied to the monitoring and evaluation of inclusive education across the three countries, and in Southern Africa as a region. Based on what the teacher educators suggested, I have grouped the indicators for monitoring and evaluating inclusive education in practice into three foci: quality education (Section 8.4.1), structural conditions (Section 8.4.2) and the common good (Section 8.4.3), discussed below.

8.4.1 Indicator 1: Quality education

Quality of education has been a topical issue in Southern Africa - several sociocultural and historical factors affect the realisation of quality education in the region (Mandikonza & Lotz-Sisitka, 2016). This study has established that inclusive education may be mainstreamed in teacher education via ESD practices. Still, teacher education has been found to be slow in transforming towards the desired teaching and learning trajectories such as inclusivity (Chitiyo & Dzenga, 2021) and sustainability (Lotz-Sisitka et al., 2022; Lotz-Sisitka & Lupele, 2017). As such, “the effectiveness of the quality of teacher education and its relevance for the 21st Century is questionable given the struggle to demonstrate the competencies for reorienting current teaching and learning” (Urenje et al., 2021, p. 87).

Thus, there is a need to critically interrogate pedagogical tendencies in teacher education as one way of monitoring and evaluating inclusive education. In this study's three cases, there were instances when evidence came up that the institutions were reluctant to enrol pre-service teachers with disabilities (EJ1). The teacher education institutions found inclusive education problematic because they lacked the resources to effectively provide for the needs of pre-service teachers with disabilities. This situation is also evident in schools across Southern Africa, where the dilemmas about the practicalities of inclusive education are evident (Meltz et al., 2014). As illustrated by teacher education institutions, mainstream primary and secondary schools may be hesitant to accept learners with disabilities because of operating constraints coupled with attitudes and mindsets. Since ESD emphasises strategies such as collaborative learning and communities of practice, teacher education could be reoriented using such strategies, which would mitigate the challenges that prevent institutions such as teacher training colleges and schools from enrolling persons with disabilities.

In the context of inclusivity in teacher education, the concern is more about quality education. Mandikonza and Lotz-Sisitka (2016) argued that “quality education should foreground sociocultural meaning making processes or *learning as connection* because such processes tend to deepen understandings of context, concepts, and practices, enhancing inclusivity and epistemic access” (p. 110, original emphasis). Therefore, among others, the number of persons with disabilities enrolled in mainstream institutions may help to monitor and evaluate inclusive education in practice. For this study, this would include the *number of pre-service teachers with disabilities* (which was primarily suggested in the DUCE case study, see Chapter 6) enrolled in teacher training at PETTC in Malawi, DUCE in Tanzania and ECOT in Eswatini and experiencing quality education through, as theorised by Lotz-Sisitka (2012/2013) and other ESD scholars in Southern Africa, *learning as connection*. This situation may also be true for other institutions and countries in Southern Africa that were not part of this formative interventionist research but were part of the SST programme (including those cases that were initially involved in this study – Karonga and St Joseph in Malawi, Mtumba and Mhonda in Tanzania, and William Pitcher and UNESWA in Eswatini).

However, numbers alone cannot give a holistic picture of inclusivity practices (Slee, 2018). Thus, there is a need for a qualitative evaluation of how enrolled students with disabilities are performing in their teacher training activities. As evidence from this study suggests, this endeavour can be undertaken via discussion forums, assessments, evaluation forms, teaching

strategies, teacher education curricula and institutional strategies, among others, to monitor meaningful learning.

8.4.2 Indicator 2: Structural conditions

Structural conditions are a major challenge in education systems in Southern Africa. As Mandikonza and Lotz-Sisitka (2016) observed, “in most cases, various structural conditions prevent people from flourishing because of their dehumanising, constraining, subversive, oppressive, or discriminatory nature” (p. 110). This observation can be contextualised in the *Vusetela* ESD Change Project at ECOT in Eswatini (EJ2). Structural conditions were a major hurdle preventing the enrolment of persons with disabilities. With the SST teacher educators’ advocacy, gradual renovations have started to address the issue; however, funding remains a challenge for this goal. Therefore, among other solutions, the amount of funding channelled to improve structural conditions may help to monitor and evaluate inclusive education in practice. In this study, this effort would entail *institutional and national budgets* given for restructuring purposes. In the ESD context, the foremost idea is to transform existing structures and systems towards sustainability. This idea resonates with the intentions of inclusive education, as the focus is also on reshaping the current systems and structures towards inclusivity.

As the evidence from this study shows, this indicator of structural conditions can be undertaken in different ways, including strategic plans, policies and practices, capacity building and feedback tools. Again, the amount of funding given to structural renovations is not sufficient to monitor and evaluate inclusivity alone, but the value realised from the improved structural conditions is crucial. The structural conditions would entail not only infrastructure but also other structures that interface with persons with disabilities, such as ICT. For example, in the case of *Tubadilike* at DUCE in Tanzania (DJ1), teacher educators were of the view that they would be able to tell if inclusive education works only when independent living is enhanced among pre-service teachers with disabilities. The current situation, whereby the college has to employ a reader and a notetaker for each pre-service teacher with a disability, may limit the number of teachers enrolled (DJ2). Thus, the SST teacher educators found ICT to be a structural intervention to mitigate the challenge (DJ3). Thus, if the institutional and governmental budgets are channelled towards improving ICT structures at the institution, it is likely that inclusivity in this teacher education institution would not be seen as a financial burden because

there would be sustainable and innovative ways of catering for such persons. In the same vein, the ESD innovations also helped with the sustainable approach towards this goal.

8.4.3 Indicator 3: Common good

Education has been designated as a common good (United Nations Educational Scientific and Cultural Organisation [UNESCO], 2021; 2014). Essentially, “the notion of the common good is built on the premise that all living things have life in common and all need to have a good life. The assumption is that if humans understand life as a common good, they must strive to enable all other life forms to live their good lives” (Mandikonza & Lotz-Sisitka, 2016, p. 109). This implies that there needs to be a realised value that comes from the mainstreaming of inclusive education in teacher education for pedagogical proficiency in the context of ESD.

The research participants’ suggestions indicate that such value could be monitored and evaluated through research and tracer studies. For example, the *Pamtondo* ESD Change Project interventions at PETTC in Malawi demonstrated responsible waste management and increased community awareness. They also modelled opportunities for cost-effective alternative sources of energy for cooking and heating that are also sources of income (PJ1). Furthermore, it has been revealed that some families have adopted briquettes, clearly indicating that the *Pamtondo* ESD Change Project has enormous potential to transform people’s mindsets from heavy dependence on charcoal and firewood to using alternatives that are environment-friendly and cost-effective. Finally, the project has emphasised the need to involve people of different abilities, including teacher educators, teachers and learners, in all efforts towards inclusive teacher education and sustainable development at the institution and in the country (PJ2).

Thus, the *Pamtondo* case is an exemplar of social learning from which the value of inclusivity could be realised. Social learning emphasises that when learning is contextualised in interactions, the effects enable people to learn with and from others without prejudice based on their inabilities and disabilities (Swartz, 2015). This theoretical argument is advanced by Lev Vygotsky in the sociocultural theory of learning. Accordingly, this study employed the concept of social learning in the Vygotskian understanding with much emphasis on the power of collaboration through formative intervention processes (see Chapters 5, 6 and 7). Expansive learning underpins the Change Project model (Mandikonza & Lotz-Sisitka, 2016), and research studies such as Agbedahin (2016) and Mandikonza (2016) have employed the Change Project

model as a research methodology (see Chapter 1). I am of the view that the Change Project model in itself is an expansive learning framework that could be employed to critically and realistically understand how interactions in sociocultural contexts result in learning. As such, the Change Project approach centres on “action learning intervention” (Urenje et al., 2021, p. 89). The emphasis on ‘action learning’ entails that the interactions that result in learning are not passive. Instead, the participants are actively involved in and contribute to the transformation processes of their practice, something that can be better investigated through a contextually dynamic framework such as the Sustainable Inclusive Pedagogical Proficiency Process (SIP3) model.

8.5 Sustainable Inclusive Pedagogical Proficiency Process (SIP3) Model

In introducing the conceptual framework for this study in Chapter 1, I put pedagogical proficiency at the centre of the three concepts: inclusive education, ESD and teacher education (see Figure 1.3). After that, I offered a working definition of the concept of pedagogical proficiency, referring ‘to the knowledge, skills, dispositions and competencies that teachers acquire during their teacher training through, inter alia, participating in training practices such as ESD Change Projects that orient teachers’ perspectives towards inclusive education’. The expectation is that this will influence their teaching practices and dispositions towards inclusivity in schools (see Chapter 1, Section 1.6.4). In this study, evidence has emerged that only when teacher educators are capacitated with pedagogical proficiency for inclusive education can they support the teachers to develop the same or associated pedagogical proficiency for teaching in schools.

In a Vygotskian sense, pedagogical proficiency is only possible if teacher educators are supported to move from their ADL through the ZPD. Through the ZPD, the teacher educators would develop, practise and expand agency for inclusivity. Creemers et al. (2013) implied that professional development is crucial in developing pedagogical proficiency. The professional development for teacher educators can be more effective to developing pedagogical proficiency if it is situated in practice, as was the case in this study, where teacher educators engaged in the SST Change Projects as a site of practice, where they also developed their pedagogical proficiency for enhancing inclusivity. This design of the SST programme, which offered professional development for teacher educators through a practice-oriented approach to Change Projects enabled the fostering of pedagogical proficiency among the teacher educators

and the pre-service teachers they were training. Through this approach, the (pre-service) teachers were also supported to develop pedagogical proficiency via teacher education (see Klemenz et al., 2019).

So, even though the SST programme was directed at teacher educators, the Change Project approach required them to also include pre-service teachers and other stakeholders relevant to their projects focusing on ESD and inclusivity. This situation also gives meaning to Bronfenbrenner's theoretical argument that bioecological systems (i.e. teacher educators and teachers) are not isolated but interactive across the 'nested' system boundaries. This point is also surfaced by Bhaskar's laminated ontology, which emphasises relations of emergence between the laminations as pointed out in Section 8.2.1 of this chapter. For all this to be meaningful, pedagogical proficiency needs to shape teachers' practices in schools towards inclusivity.

Therefore, ultimately, teachers' inclusive pedagogical proficiency would be demonstrated through learning in schools (Stronge, 2018). An example from this study would be the case at PETTC in Malawi. The pre-service teachers involved in the Change Project expanded it to their teaching practices in their schools (see Chapter 5). In the schools, pre-service teachers mirrored inclusivity practices started in the institution via the Change Project. Put theoretically, as a formative interventionist facilitator, I supported mediation with teacher educators learning in their ZPD through the research. In turn, the teacher educators worked with pre-service teachers and scaffolded their teaching practice planning to work independently in the teaching practice schools, where pre-service teachers also mediated and expanded learners' learning.

Pedagogical proficiency entails mechanisms (e.g. the SST course) that teacher education systems employ for teacher educators to work with pre-service teachers in developing approaches, skills and conduct with the potential to enable the inclusion of all learners in mainstream education while providing support towards epistemological empowerment and cognitive independence. While this expanded impact of the ESD Change Project was not part of this study, it could be the focus of future research. Like in the PETTC case in Chapter 5, there are several other examples of ESD Change Projects from the SST programme that did cross boundaries between teacher educators, pre-service teachers, communities and schools, with some strong evidence that the SST Change Projects have led to changed teaching practices in schools (UNESCO ROSA, 2023). UNESCO ROSA (2023) concluded:

The Change Project model has proved to be catalytic in mobilising curriculum transformation in participating institutions as well as in advancing ESD in national policies. Implementing transformation through communities of practice around Change Projects has proved to be an enormously cost-effective capacity development model. It is also evident that ESD Change Projects have the potential to empower transformation beyond teaching and learning, including economic transformation of institutions as well as inspiring a sense of self-reliance in individuals and communities of practice. While it is satisfying to note that several Change Projects managed to integrate ESD into key elements of education (institutional policies, pedagogies, assessment, and capacity development of fellow teacher/TVET educators), there is however a need to scale them beyond departments and institutions. With additional resources, Change Projects have the potential to be extended to other institutions in countries. (p. 80)

For all this to happen, there is a need for a systematic model that could help teacher education systems develop pedagogical proficiency and foster inclusivity, hence the SIP3 model. I argue for the SIP3 model as there remains a dominance of exclusion in schools despite emerging policy intentions to strengthen inclusion (Ainscow, 2020b; Graham, 2020). As unfolded across this study, my argument is that teacher education can be a vital contributor to addressing this problem if practical and transformative approaches, such as those supported by the ESD Change Project model, can be developed in service of inclusivity mainstreaming in teacher education. This argument holds significance as past research studies in Southern Africa (e.g. Chitiyo & Dzenga, 2021; Engelbrecht, 2020; Pather & Nxumalo, 2013) reported that commitments to inclusive education are largely rhetorical; putting inclusivity commitments into practice has been elusive. These same research studies argue that education systems need to offer ways to mainstream inclusive education. International reports such as the 2020 GEM report identified teacher education as one sure way education systems need to focus on to mainstream, foster and sustain inclusive education. But as reported in Chapter 2, as yet, Southern Africa lacks adequate indicators to guide such mainstreaming.

Thus, this study worked in the ESD context to research what the nexus across inclusive education, ESD and teacher education could look like in the southern African context to move away from the rhetoric problem and to also develop possible indicators. So far, the study has established insight into this nexus and revealed the potential for mainstreaming inclusivity into teacher education at this nexus (see Section 8.3 of this chapter), and it has, from this praxis as well as the literature review, surfaced some indicators (see Section 8.4 of this chapter) that could help in monitoring and evaluating this nexus. Based on the findings of this study, I propose a practice-research process model that could potentially guide further work around inclusive education in teacher education through ESD. Figure 8.4 below shows the SIP3 model.

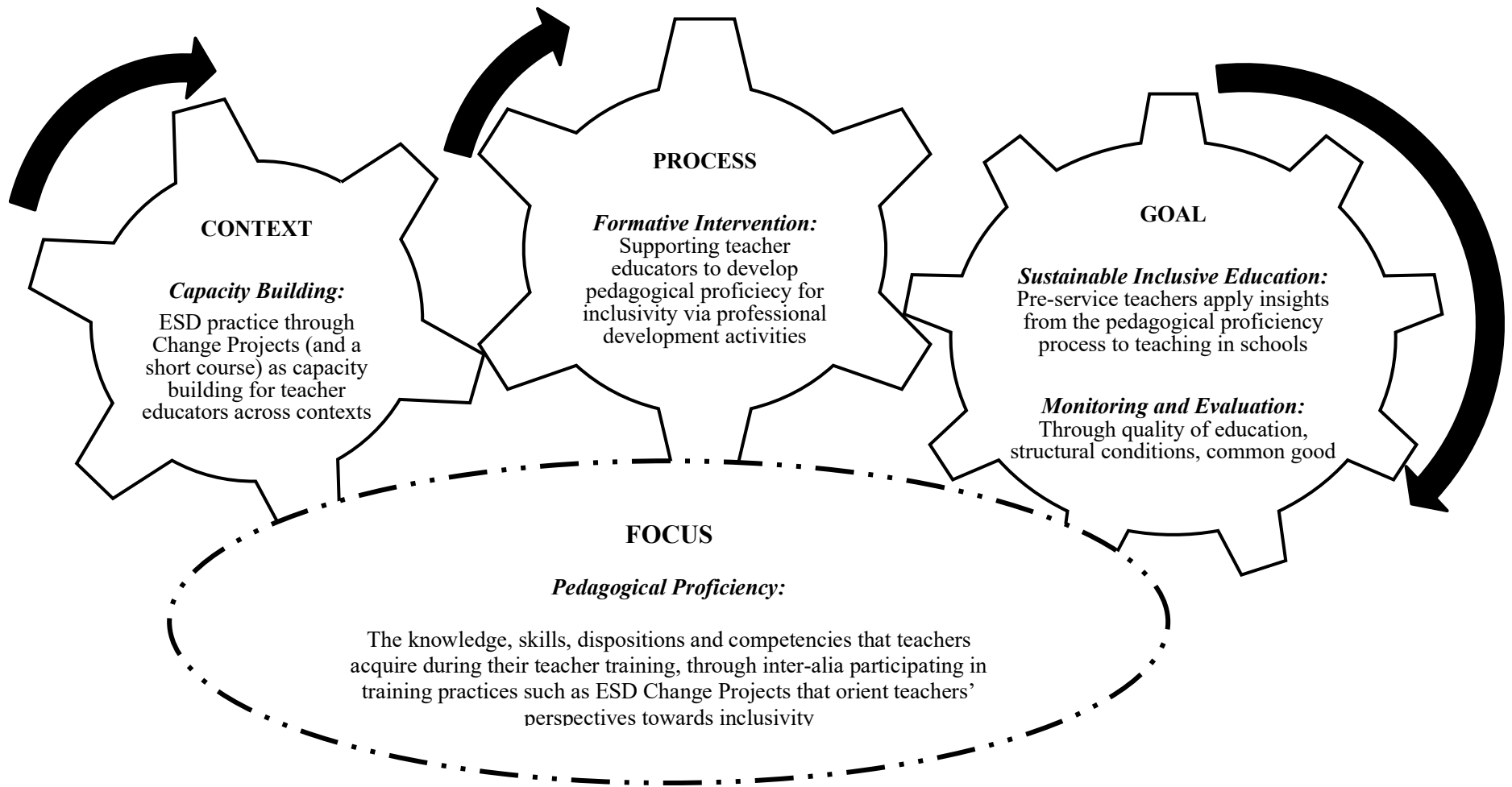


Figure 8.4: Sustainable Inclusive Pedagogical Proficiency Process (SIP3) model

The SIP3 research model in Figure 8.4 above consolidates the research design and processes in this study. The supposition is that this model can be contextualised into other educational research settings to support capacity building, particularly around inclusive education, ESD and teacher education for pedagogical proficiency. The problem that necessitated this study was multi-fold. Foremost, there was a lack of explicit evidence in the southern African context that inclusive education could be mainstreamed in teacher education via ESD praxis. This study has established that, indeed, we may have such a kind of relationship between the three notions, but that would require a critical understanding of the biopsychosocial characteristics that shape inclusivity, sustainability and teacher training, in which interactions are fostered in nested systems via proximal processes. Also, there was a lack of indicators for monitoring and evaluating inclusive education. Based on evidence from this study, participants suggested that the quality of education (including the number of persons with disabilities enrolled), the structural conditions (including the amount of funding towards restructuring), and the common good (including the quality of life realised from inclusivity) form a framework of indicators for monitoring and evaluation. This multi-dimensionally complex problem centres on issues of policy, practice and research. Much as this study has attempted to give a picture of the nexus across the three notions and the possible indicators, there is a need for further work around these foci. This suggestion comes against the background that this study may be one of the first in the southern African context to attempt to establish a relationship between inclusive education, ESD and teacher education.

In light of the preceding situation, it was significant for this formative interventionist study in an SST programme to focus on the pedagogical proficiency process through ESD Change Projects in Malawi (PETTC), Tanzania (DUCE) and Eswatini (ECOT). For education systems to achieve quality education, which can be monitored through the number of persons with disabilities enrolled in the system and whether they are being supported to learn successfully (Zaretskii, 2016), as argued in this study, teacher educators need to be supported to develop pedagogical proficiency, which they would eventually expand to teachers in order for this indicator to be realised. This view speaks to UNESCO's (2020) argument that the preamble to quality education is quality teacher education. As Klemenz et al. (2019) implied, it is through teacher education that teachers can become pedagogically inclusive in their practice. Therefore, the SIP3 model recognises that pedagogical proficiency can only be realised in practice, hence

its proposition to enable teacher educators and teachers to work together in interactive, influencing and expansive systems (see Figure 8.4.)

Secondly, improved structural conditions are only meaningful in inclusive education if the central implementers have the necessary pedagogical proficiency (Creemers et al., 2013). As noted earlier, teacher educators require professional development to improve their inclusive pedagogical proficiency, which, as was shown in the Eswatini case (see Chapter 7), involves sensibility to resolving structural constraints to inclusivity. Thus, only when teacher educators are pedagogically proficient in expanding teachers' inclusive pedagogy can they competently advocate for accommodative structural conditions, with this sensibility also being important to their pedagogical proficiency for inclusivity. Through models such as the SIP3, both teacher educators and teachers can develop their pedagogical proficiency, become aware of structural conditions that impede inclusivity, and work on improving such conditions through sustainability principles.

Lastly, whatever efforts are made to support inclusive education, the ultimate goal is to transform learning in schools. Stronge (2018) noted that, it is through schooling practices that we can monitor whether teachers are pedagogically proficient regarding inclusivity. It is also the teachers' practices and the outcomes of inclusive education that will determine whether these efforts contribute to the common good through improved quality of life. Thus, the SIP3 model, apart from being a practice framework, is also a research framework that can enable further work on improving the pedagogical proficiency needed for inclusive education, starting from teacher education and carried through into schools and communities, as argued through the nested system in Bronfenbrenner's inspired framing of the study. However, this requires further empirical research to be conducted at the level of schools, which I was not able to do in this study; nonetheless, the study indicates this possibility.

8.6 Key Research Findings

The following are the key research findings from this formative interventionist study:

1. The understandings of inclusive education, ESD and teacher education in the three case studies across Malawi, Tanzania and Eswatini within the southern African context are determined by biopsychosocial characteristics, i.e. personal factors

embedded in nested systems that influence teacher educators' practices, but these expand from personal factors to other spheres of the nested system, hence also the suggested SIP3 model above for developing pedagogical proficiency.

2. Areas that need strengthening for teacher educators to mainstream inclusive education in teacher education programmes via ESD need to expand the capabilities of the teacher educators through nested systems in proximal processes, i.e. building on already acquired knowledge and experience.
3. Strategies that teacher educators can use to mainstream issues of inclusive education in teacher education programmes through ESD can effectively be approached from a ZPD perspective in which teacher educators' potential capabilities are used to transform their practices, i.e. expanded possibilities for further improved practices with formative intervention support and working in communities of practice on ESD Change Projects.
4. Ways for monitoring and evaluating inclusive education in teacher education programmes across ESD contexts can be actualised in indicators, with the caveat that dimensions of temporality need to be considered, in which quality of education, structural conditions and the common good are renegotiated and reoriented towards inclusivity in teacher education via ESD.

8.7 Implications of the Research Findings

The philosophical basis of this study manifested itself in the critical interrogation of the relationship between inclusive education, ESD and teacher education. This involved engaging teacher educators in the SST programme in the dialectical movement of their experience and concepts from the ADL towards pedagogical proficiency for inclusivity in the ZPD within a nested system approach with emergent relations between the different nested systems.

This research responded to the SDG 4 Target 4.7 (Sustainable Development and Global Citizenship), which aspires to 'ensure that all learners acquire the knowledge and skills needed to promote sustainable development' (UN, 2015). Consequently, the research intentions

resonated with policies in Malawi, Tanzania and Eswatini that designate inclusive education as an enabler of sustainable development. The research was also conceptualised in light of the 2020 PEER profiles, which indicated that inclusive education remains under-elaborated in monitoring and evaluation systems in Southern Africa. As presented in Chapters 5, 6 and 7, research findings indicate that it is possible to promote, strengthen and sustain inclusive education from the starting point of teacher education, at least concerning teachers' pedagogical proficiency.

The three case studies pertained to the three institutions. However, the implications of this study may extend to other institutions in Malawi, Tanzania and Eswatini. For example, many other institutions were involved in the SST programme in the three countries and also focused on the same unit of analysis, but could not be included in the study. Further research can be undertaken to test the findings from this study in these contexts, including those institutions from the three countries that were initially part of the study, but which I did not focus on for in-depth qualitative analysis in the study due to the scope of data.

From a critical realist perspective, these institutions may likely have had mechanisms shaping similar experiences as the three institutions, the possibility of which I will consider in post-doctoral research where I will have space to work with the data from the other cases. Taking this possibility further, this study was limited to three cases in three countries: Malawi, Tanzania and Eswatini, while the SST programme covered 11 southern African countries. There are other SST countries that were not involved in this study but worked on Change Projects around inclusivity in teacher education via ESD. These could therefore also form part of ongoing research, especially since outcomes from all 145 ESD Change Projects have now been consolidated by the UNESCO ROSA office team (UNESCO ROSA, 2023). From a critical realist point of view, such Change Projects may have had similar situations as this study. Moreover, most educational challenges in Southern Africa are of regional scope and concern (Mandikonza & Lotz-Sisitka, 2016), and there is therefore a possibility to test both the model and the indicators in a wider context going forward.

8.8 Recommendations for Policy, Practice and Further Research

Educational reports such as the 2020 GEM report found that teacher education is one of the foci that needs to be focused on and strengthened to transition towards inclusive education. As implied in the 2020 GEM report and as argued in this study, the understanding is that education can only be truly inclusive when teachers are capacitated with inclusive pedagogical proficiency, for which teacher education becomes a conduit (see Chapter 2). However, the southern African context lacks an educational model that could reorient teacher education towards inclusivity. This study explored how a Change Project model conceptualised within a nested system framing (see Chapter 1) could be a vehicle for advancing inclusivity in teacher education from an ESD perspective in a southern African context.

This study showed that the ESD framework and the Change Project model enabled teacher educators to form communities of practice, co-engage with pre-service teachers, collaborate with diverse abilities, and learn with and from others in and across different levels of the nested system. Since teacher educators are entrusted with the responsibility of ensuring inclusive pedagogical proficiency in mainstream teachers (Florian & Linklater, 2010; Florian & Camedda, 2020; Rowan et al., 2021), this study recommends that policies should be formulated from a systems perspective, whereby interactions within and across stakeholders are promoted (see also Figure 8.4 above). Through such interactions, learning for change can occur and advance the inclusivity agenda in teacher education via ESD, as this study has demonstrated in the three case studies.

Regarding practice, frontline implementers of inclusive education, including teacher educators and teachers, could contextualise their pedagogical practices in the ESD framework, which has mechanisms for augmenting and sustaining inclusivity practices. This study recommends adopting the ESD framework (as a teaching and learning philosophy) and the Change Project model as part of the teacher training mechanism for inclusivity. With such an adoption, teacher educators could engage with teachers to develop their understanding of sustainability principles and find the applicability of ESD to inclusive education. They could also frame assessment designs that evaluate the learning capabilities of teachers and empower them to use their agency for transformation or change. Potentially, this model from teacher education praxis can influence practice in schools where teachers could work with learners with diverse abilities.

For example, as shared in Chapter 5, the PETTC Change Project in Malawi worked on its activities alongside its teaching practice in schools. In these schools, teachers worked with learners to replicate the *Pamtondo* activities while reshaping the inclusivity praxis. Thus, this study also recommends that the Change Project model be extended to primary and secondary schools to advance inclusivity in mainstream education. The Change Project model could manifest in inclusive education at the school level through activities that could, for example, involve learners in recycling waste into inclusive learning materials and developing positive attitudes towards working together regardless of (dis)abilities.

To follow up on the policy and practice performance in inclusive education, this study recommends that research should be conducted drawing on a contextually dynamic framework that is manifested in the systems of human development and learning, such as that proposed in the SIP3 model (Figure 8.4). In the SIP3 model, the researcher would take agency as a formative interventionist to co-produce knowledge *with* participants. However, the agency should be approached with much criticality and reflexivity (Mukwambo et al., 2023), as this study has shown that such research is contextually diverse, and the researcher needs to be able to respond to the ADL of the teacher educators involved in the study and work with them in their communities of practice to advance their inclusive pedagogical proficiency. As shown in the three cases (Chapters 6-7), this happens differently, and, as the Bhaskarian critical realist philosophy argues and as discussed in Section 8.2.3 of this chapter, research can serve as a vehicle for transformation and emancipation. Thus, researchers in inclusive education, ESD and teacher education who are genuinely concerned about change through research may consider the SIP3 model, as it offers process guidance for such research. I acknowledge that the model may require adjustments to suit contextual dynamics, and the model is embryonic, fluid and open to further conceptualisation.

8.9 Originality and Contributions of the Study

The UNESCO's (2021) Berlin Declaration on ESD affirmed the essence of inclusivity in all ESD practices, including teacher education. This implies that teacher educators could use the ESD praxis to encourage inclusivity among pre-service teachers, with an expectation that the same would inform practices in schools. This study applied bioecological and sociocultural theories to investigate the mainstreaming of inclusivity in teacher education in the context of

ESD praxis in a southern African context. The central argument in this study is that the transformative orientations of ESD (transformative learning, collaborative learning, co-learning, community of practice, whole institution approach – as encouraged through the SST course and Change Project model) provide concrete strategies for mainstreaming inclusive education in teacher education via ESD praxis when discourses from human development and social learning perspectives to develop pedagogical proficiency in teacher educators and pre-service teachers. Therefore, the originality and contributions of this study are evident in three main impact areas, namely:

1. The articulation of how to enable and support the development of pedagogical proficiency through theory and practice development for inclusivity in teacher education in the ESD context with an multi-national reference;
2. Contribution to the development of indicators (quality of education, structural conditions and the common good) for monitoring inclusive, quality (teacher) education in Malawi, Tanzania and Eswatini; and
3. Research praxis development using a contextually dynamic Sustainable Inclusive Pedagogical Proficiency Process (SIP3) model for supporting comparative research in education that allows for contextual diversity (not homogenisation) across contexts.

8.10 Challenges and Limitations of the Research

Overall, while this study was complex and was conducted in three countries, at a practical level, there were no significant challenges that affected the study, except for the initial ambition to conduct three cases in each country, which proved to be too extensive in scope, especially concerning the complexity of the study object and the theoretical tools that I was working with to approach this object of study (see reflections below). In the end, together with my supervisor, I decided to instead work with three cases to develop an in-depth interpretation rather than a more superficial analysis across more cases. This is because the intention was to delve deeply into how to support the development of inclusivity in teacher education in southern African countries, where the praxis is still underdeveloped. Given the complexity of the study, it was important to work carefully, use an attentive approach to planning the research activities, and ensure self-reflexivity throughout the research process. I also had to work in such a way that I was able to obtain the support of the research participants throughout the process, which

required that I take a humble and open-minded stance in the formative intervention research process, not dictating to the teacher educators but working *with* them to unfold new possibilities in their practice. I was able to travel to each country and the research sites involved in the study at least twice and was able to maintain a good rapport with the study participants.

The study worked with different theoretical and design tools that needed in-depth, thorough and careful consideration to avoid working at a rhetorical level with these tools. Bringing the analysis together was also challenging and required carefully related conceptualising of data and theory in each case, and then more synthetically across the study. As such, comprehending and articulating the research model and its contribution to inclusive pedagogical proficiency through teacher education praxis itself proved challenging but rewarding because, through it, the study was able to investigate and support the mainstreaming of inclusive education in teacher education via the three ESD cases. It was able to surface indicators for inclusive education relevant to contemporary policy, particularly SDG 4's emphasis on quality education and the social justice intention of inclusive education itself.

A specific note is on the formative intervention as a research design and approach. At first, I had a limited understanding of this research framework and ended up intending to research *on* the participants, especially at the very beginning of the study when I explored South Africa and Mozambique as part of the scope. Because of a better understanding of the formative intervention design, I improved my approach and ended up working *with* teacher educators in Malawi, Tanzania and Eswatini. To do this, I had to develop a better understanding of the relationship between the *first stimulus* and the *second stimulus* in the research process (see Engeström, 2011). I also had to maintain an open mind in terms of what the participants might come up with as possible expansions of their practices. As indicated in the case studies (see Chapters 5-7), this turned out to be different in each case, indicating that the formative interventionist research role requires contextual sensitivity and open process orientation, while also working carefully through a well-designed research process with participants. Thus, the formative intervention design is appropriate for researchers eager to support change in participants' practices, but this would require the researcher's reflexivity and care in both the co-engagement and documentative processes.

8.11 Conclusion

Foremost, this study was designed in light of anecdotal evidence that ESD can be a viable synergy for bringing to discourse issues of inclusivity in teacher education, but the supposed relationship between inclusive education, ESD and teacher education was very speculative in a southern African context. It was interesting to note that when I started the research, a number of the SST Change Projects had already decided to focus on ESD and inclusivity in their teacher education praxis, which indicated field-based interest amongst teacher education practitioners; hence, I was able to follow up with these teacher educators to become part of this study. Figure 8.5 below summarises the study's design, process, analysis and outcomes.

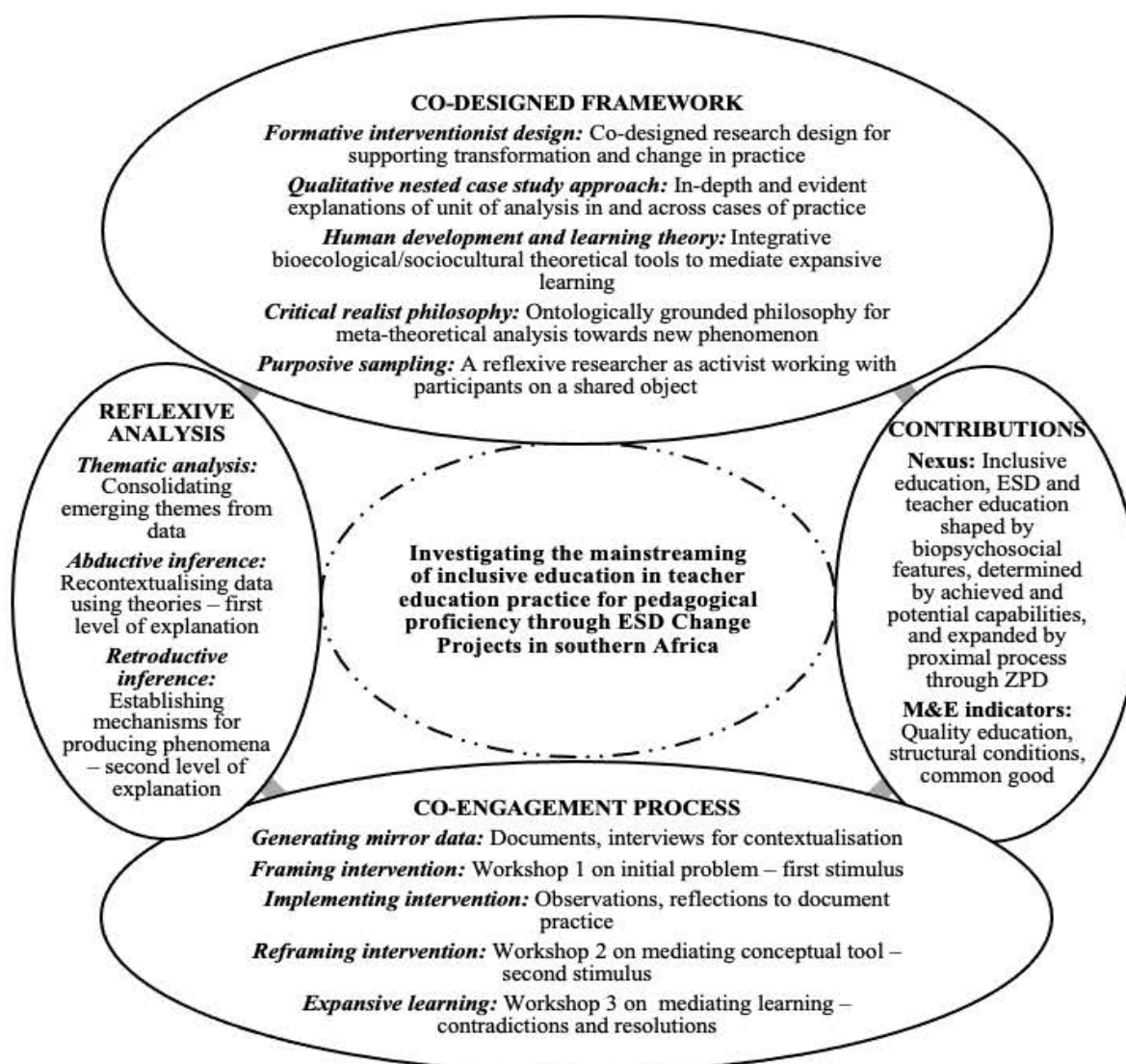


Figure 8.5: Summary of the study

As shown in Figure 8.5. above, this study explored how teacher educators in Southern Africa can mainstream inclusive education in the ESD context. Using Bronfenbrenner's bioecological systems theory and Vygotsky's sociocultural theory, the research adopted a formative interventionist approach in expansive learning methodology with a nested case study design underlaboured by a critical realist philosophy. Teacher educators in Malawi, Tanzania and Eswatini involved in UNESCO's SST programme implemented ESD Change Projects. The study found that teacher educators developed inclusive pedagogical proficiency, enhancing support for inclusivity in schools. The study also emphasised the importance of monitoring inclusivity and advancing pedagogical proficiency through the SIP3 model, which promotes engaged practice and research.

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APPENDICES

Appendix 1: Generic Questionnaire

<p>PREAMBLE</p> <p>I am Ben de Souza, a PhD student in the Environmental Learning Research Centre (ELRC), Department of Education at Rhodes University. You have received this questionnaire because you are a participant in UNESCO's Sustainability Starts with Teachers (SST) course. The purpose of this questionnaire is to survey issues you are dealing with in their change projects. The data collected shall inform both the SST course and my PhD study.</p>	
<p>SUBMISSION</p> <p>This is an online Google Form. You are requested to click the Submit button at the end of the form for automatic submission. In case you face any problems with the content or submission of this form, kindly contact me through souzaben@outlook.com. I will greatly appreciate if you could submit this form within seven days from the day you received it.</p>	
<p>PERSONAL DETAILS</p>	
Full name	
Country	
Institution	
<p>SST COURSE</p>	

What has been your experience of the SST course?	Most relevant to my change project	
	Most relevant to my teacher education programme	
	Less relevant to my change project	
	Less relevant to my teacher education programme	
Which learning action of the SST course do you find more relevant to your context?	Learning Action 1	
	Learning Action 2	
	Learning Action 3	
	Learning Action 4	
	Learning Action 5	
	All	
CHANGE PROJECT		
What is the type of change project?	Individual	
	Pair	
	Group	

	Institutional	
What is the focus in your change project?	Waste Management	
	Teaching Methodologies	
	Environmental Conservation	
	Sustainable Production and Consumption	
	Inclusive Education	
	Teacher Education	
	Other (specify)	
What support do you need to improve your change project?	Content Support	
	Technical Support	
	Methodological Support	
	Other (Specify)	
Which other issues do you think may	Stakeholder Engagement	
	Partnerships	

also be included in your change project?	Disability Inclusion	
	Inclusive Education	
	Other (specify)	
TEACHER EDUCATION PROGRAMMES		
What is the focal level of teacher education programmes at your institution?	Elementary or Pre-primary	
	Primary	
	Secondary	
	Vocational or Technical	
	Management	
	Special education	
	Learning support	
	Other (specify)	
	Sciences	

Which are your focal courses or modules in the teacher education programmes at your institution?	Languages	
	Gender	
	Communication	
	Special Education	
	Inclusive Education	
	Disability Inclusion	
	Learning Support	
	Humanities	
	Other (specify)	
What areas of education system do you think lack in your courses or modules in teacher education programmes?	Policy awareness	
	Disability Inclusive	
	Inclusive Education	
	Management	
	Environmental awareness	

	Other (specify)	
WAY FORWARD		
Given a chance to be supported in order to improve both your change project and your teacher education programmes, which areas would be most relevant to you?	Pedagogy	
	Learning Theories	
	Monitoring and Evaluation	
	Disability Inclusion	
	Learning Support	
	Inclusive Education	
	Special Education	
	Environmental Sustainability	
	Climate Change	
	Other (specify)	
If your change project is dealing with or has some	Yes	

<p>issues on inclusive education, disability inclusion, special education and social justice, would you be interested to take further your responses in this questionnaire by participating in study research?</p>	<p>No</p>	
<p>If interested to participant in further research, how could you be contacted?</p>	<p>Email</p>	
	<p>Phone Call</p>	
	<p>WhatsApp</p>	
	<p>Text Message</p>	
	<p>Other (specify)</p>	

Appendix 2: Document Review Guide

<p>Country:</p> <p>Date.....</p>		
Document and Focus	Guiding Questions	Researcher's Review
E.g., Tanzanian National Strategy on Inclusive Education	1. What schooling systems does the document recognise with respect to inclusive education, ESD and teacher education?	
E.g., Objective 1	2. How can the schooling systems that the document recognises enable or constrain the mainstreaming of inclusive education in teacher education through ESD practices?	
	3. How can the schooling systems that the document recognises be expanded or enhanced for mainstreaming inclusive education in teacher education via ESD?	

Appendix 3: Interview Schedule

<p>Country:</p> <p>Institution:</p> <p>Interview No.:</p> <p>Participant ID:</p> <p>Date and Time:</p>		
Focus	Guiding Questions	Notes
Objective 1	1. What are your understandings of inclusive education in your context?	
	2. What are your understandings of Education for Sustainable Development (ESD) in your context?	
	3. Why are there teacher education programmes in your institution and country as part of schooling systems?	

	4. How can you relate the three schooling systems we have discussed so far: inclusive education, ESD and teacher education?	
Objective 2	5. Which schooling systems do you think need strengthening to encourage issues of inclusion in teacher education in the courses you teach, your institution and your country?	
	6. What supporting systems may you, your institution and your country need to bring or encourage issues of inclusion in teacher education?	
Objective 3	7. How can you support the process of encouraging inclusive education in teacher education using ESD programmes you already have such as the Sustainability Starts with Teachers course?	
	8. Why do you think the process support strategies you have explained are capable in bringing or encouraging issues of inclusion in teacher education through ESD programmes?	
Objective 4	9. What ways can you use to monitor and evaluate whether your ESD teacher	

	education programmes include and promote issues of inclusive education over time?	
	10. How would you encourage your immediate systems such as your student teachers to promote inclusive education when they go to teach in schools having learners with disabilities and other biopsychosocial characteristics?	
	11. What things have you learnt from your macro environment such as the SST course and your change project so far?	
	12. Which issues or aspects of your change project are you finding challenging?	
	13. How can others support you practically to improve your change project?	
	14. Why is it worth your time, institution's resources and country's priority to offer ESD teacher education programmes that encourage inclusive education?	

Appendix 4: Observation Rubric

Country:		
Institution:		
Observation No.:		
Date and Time:		
Focus	Guiding Questions	Notes
Institutional (Objectives 1 and 2)	1. What systems in terms of policies and resources that the institution has those present possible ways for inclusive ESD teacher education programmes and projects?	
	2. What system constraints the institution has that could discourage inclusive ESD teacher education programmes and projects?	
	3. Within the context of the institution, how can the opportunities utilised and the constraints eased for teacher educators to design and implement effective inclusion-oriented ESD teacher education programmes and projects?	
Pedagogical	4. In what ways does the teacher educator imagine or reconstruct (during lecture or tutorial) the classroom and the school in which the student teachers will be working with learners of diverse biopsychosocial features?	

(Objectives 2 and 3)	5. What methodologies the teacher educator uses in lectures and tutorials?	
	6. How can the methodologies enable or constrain inclusive pedagogical proficiency in student teachers?	
Assessment	7. What assessment strategies does the teacher educator use in his or her courses or modules?	
(Objectives 3 and 4)	8. How does these assessment strategies offer or steal opportunities for inclusive education once the student teacher goes to teach in mainstream schools?	

Appendix 5: Workshop Guide

Country:			
Workshop No.:			
Place:			
Date and Time:			
No. of Participants:			
Focus	Guiding Questions	Method	Notes
Objective 1 Workshop 1	1. What are your experiences or achievements in teacher education regarding issues of inclusion and ESD?	Individual Question-and-Answer	
	2. Why do you think we need to talk about inclusion in teacher education based on what you already know?	Pair Discussion and Presentation	
Objective 2 Workshop 1	3. What new learning opportunities does your ESD teacher education change project from the SST course present for incorporating issues of inclusion?	Individual Brainstorming and Poster Presentation	
	4. How can those new learning opportunities be maximised within	Individual Brainstorming and Oral Feedback	

	your courses, modules, institution and country?		
Objective 2	5. Which areas do you think are succeeding or you have already achieved in your SST Change Project?	Individual Card Game	
Workshop 2	6. Which areas do you think are facing challenges or you not yet achieved in your SST Change Project?	Pair Card Game	
Objective 3	7. What needs to be done to address the challenges in your SST Change Project focusing on disability inclusion?	Individual Question-and-Answer	
Workshop 2	8. How will you use the help or support given to strengthen your teacher education programmes beyond the SST Change Project?	Round Table Discussion	
Objective 4	9. How would you know that your teacher education programmes are encouraging issues of inclusive education among your student teachers?	Pair Discussion and Oral Presentation	
Workshop 3			

	10. What is the relevance of monitoring and evaluating whether your ESD teacher education programmes are preparing student teachers to be competent in inclusive education?	Pair Discussion and Poster Presentation	
	11. What needs to be done to improve the participants' ESD change projects to ensure disability inclusion in teacher education programmes beyond the SST course?	Researcher's Facilitation	
	12. How can the improvements be done to the participants' ESD change projects to mainstream disability inclusion in teacher education programmes?	Researcher's Presentation	

Appendix 6: Research Journal Structure

Journal Entry No.	Context of Entry	Description	Relevance
E.g., 1 (2021)	E.g., a visit to University A in Malawi on 22-04-2021	E.g., I found that the teacher educators are....	Objective 1
2 (2021)			
1 (2022)			
2 (2022)			
1 (2023)			
2 (2023)			

Appendix 7: Gatekeeper Permission Letter



Rhodes University
PO Box 94
Grahamstown 6140
South Africa

4th November 2021

The Project Manager
Sustainability Starts with Teachers (SST)
UNESCO Regional Office for Southern Africa
8 Kenilworth Road, Newlands
Highlands, Harare
Zimbabwe

Dear Sir/Madam,

REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN SST PROGRAMME

I am a registered PhD student in the Department of Education at the Rhodes University in South Africa. My supervisor is Distinguished Professor Heila Lotz-Sisitka.

The proposed topic of my research is: Mainstreaming Inclusive Education in Teacher Education in the Context of Education for Sustainable Development: A Study in Change

Projects from Southern Africa. The aim of the study is to investigate the issue of Education for Sustainable Development (ESD) and inclusivity within a comparative research framework in Tanzania, Malawi and Mozambique in order to support teacher educators design training programmes that enable teachers to develop relevant skills for inclusive education that complements sustainable development.

I am hereby seeking your consent to contact and select SST course participants for the said study. To assist you in reaching a decision, I have attached to this letter:

- (a) A copy of a provisional ethical clearance certificate issued by the University
- (b) A copy of the research instruments which I intend using in my research

Should you require any further information, please do not hesitate to contact me or my supervisor. Our contact details are as follows:

Ben de Souza (Student) – souzaben@outlook.com

Dist. Prof H. Lotz-Sisitka (Supervisor) - h.lotz-sisitka@ru.ac.za

Upon completion of the study, I undertake to provide you with feedback through an e-copy of my doctoral thesis.

Your permission to conduct this study will be greatly appreciated.

Yours sincerely,



Ben de Souza

Rhodes University, Research Office, Ethics

Ethics Coordinator: ethics-committee@ru.ac.za

t: +27 (0) 46 603 7727 f: +27 (0) 86 616 7707

Room 220, Main Admin Building, Drostdy Road, Grahamstown, 6139

Appendix 8: UNESCO Permission Letter



Ben de Souza
Department of Education
Rhodes University
PO Box 94
Grahamstown 6140
South Africa

20 April 2022

REF: HAR/DIR/2022/L00364

Ref: Permission to Conduct Doctoral Research With Sustainability Starts With Teachers (SST) Course Participants

Dear Ben,

I refer to your letter received on 22nd November 2021 requesting permission to conduct doctoral research with SST participants from Tanzania, Malawi and Mozambique; in particular “to investigate the issue of Education for Sustainable Development (ESD) and inclusivity within a comparative research framework”.

Permission to conduct doctoral research with SST participants is hereby granted on the following conditions:

1. Your Doctoral Research has been approved by Education Higher Degrees Committee at Rhodes University
2. Your ethics proposal was approved by Rhodes University Ethical Standards Committee – Education Sub-committee on Human Ethics.
3. Consent to participate in the research is sought from each participant and the consent and assent forms should be kept on record.
4. You consent not to represent UNESCO during the entire research process.
5. You confirm to share the research outputs with UNESCO Regional Office for Southern Africa (UNESCO ROSA), for example the electronic copy of your doctoral thesis.

I wish you all the best in you research, hoping you will abide to the above mentioned conditions.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Lidia Arthur Brito", with the initials "a.i." written below it.

Lidia Arthur Brito, PhD
Regional Director and Representative

United Nations Educational, Scientific and Cultural Organization Regional Office for Southern Africa
P. O. Box HG435 Highlands, 8 Kenilworth Road, Newlands, Harare, Zimbabwe
T: +263 242 776775/9; +263 8677008403
Fax : +263 242 776055
E-mail : harare@unesco.org

Appendix 9: Institutional Access Letter



Rhodes University
PO Box 94
Grahamstown 6140
South Africa

4th November 2021

Dear Sir/Madam,

REQUEST FOR PERMISSION TO CONDUCT RESEARCH

My name is Ben de Souza, and I am a PhD student at Rhodes University in South Africa. The research I wish to conduct for my doctoral thesis requires me to interview teacher educators involved in UNESCO's Sustainability Starts with Teachers course, observe their lectures and tutorials, and convene workshops with them. This research will be conducted under the supervision of Distinguished Professor Heila Lotz-Sisitka.

I have sought permission from UNESCO, see the attached permission letter. I am writing to you to seek formal consent to approach the teacher educators as participants for this research. Furthermore, I would be grateful if I may access curricula and policy documents related to teacher education in your institution.

I attach a copy of my research proposal which includes copies of the consent and assent forms to be used in the research process. Once I have received clearance from Rhodes University, I will provide you with the ethical clearance letter. As part of this, I undertake to ensure that the

name of your institution and all participants will be replaced with pseudonyms and that all the materials I collect as part of the research will be accessible only to myself and my supervisor. Upon completion of the study, I undertake to provide you and the teacher educators with access to the findings.

If you require any further information, please do not hesitate to contact me via this email address: souzaben@outlook.com.

Thank you for your time and consideration in this matter.

Yours sincerely,



Ben de Souza

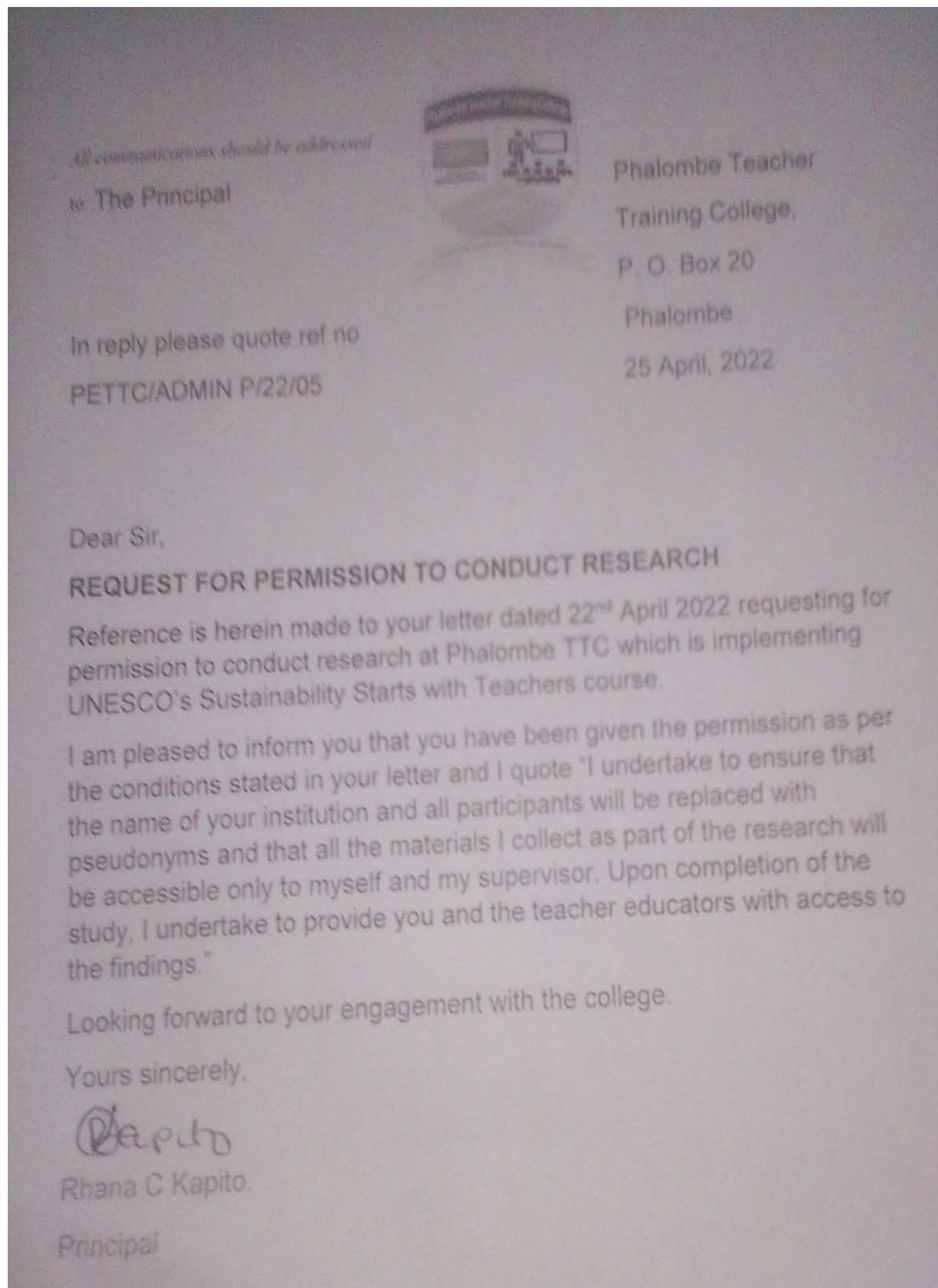
Rhodes University, Research Office, Ethics

Ethics Coordinator: ethics-committee@ru.ac.za

t: +27 (0) 46 603 7727 f: +27 (0) 86 616 7707

Room 220, Main Admin Building, Drostdy Road, Grahamstown, 6139

Appendix 10: PETTC Permission Letter



Appendix 11: DUCE Permission Letter

UNIVERSITY OF DAR ES SALAAM
DAR ES SALAAM UNIVERSITY COLLEGE OF EDUCATION (DUCE)
OFFICE OF THE DEPUTY PRINCIPAL
ACADEMIC, RESEARCH AND CONSULTANCY
P.O. BOX 2329 DAR ES SALAAM TANZANIA

Direct Line: +25 22 2850978



Email: dparc@duce.ac.tz
Website: www.udsm.ac.tz
www.duce.ac.tz

Ref. No.:QA.354/377/01 'A'/50

2nd May, 2022

Rhodes University
PO Box 94
Grahamstown 6140
SOUTH AFRICA

Dear Ben de Souza

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT DUCE

We acknowledge receiving your letter dated 22/04/2022 requesting to conduct research DUCE, in particular observing lectures and conducting interviews and a workshop with teacher educators involved in UNESCO's Sustainability Starts with Teachers course.

2. We understand that such UNESCO's course also involves teacher educators at DUCE. Given our commitment in promoting internationalization and knowledge exchange, we are happy to grant you the permission to conduct your research at DUCE from June to August, 2022. Thus, this letter serves as an official invitation to you to visit DUCE for that purpose.

3. While at DUCE you will be under supervision of Dr. Daniel Sabai from the Department of Geography and Economics. You shall also be obliged to adhere to National Laws as well as ethical principles as stipulated in your research clearance letter. As such, DUCE will not be responsible for any misconducts thereof. Finally, you will be required to share your findings with the teacher educators and to the College upon completion of the study.

4. We look forward to seeing you at DUCE and hopefully discuss further areas for collaboration between DUCE and Rhodes University

5. Sincerely,

Dr. Christina Raphael
DEPUTY PRINCIPAL (ARC)

Copy: Principal
Deputy Principal (PFA)
Ag. Director, Research and Innovation

The University of Dar es Salaam is an Equal Opportunity institution committed to non discriminatory manner of student admission and staff recruitment.

Appendix 12: ECOT Permission Letter



ESWATINI COLLEGE OF TECHNOLOGY

Tel: (+268) 2404 2681/2/3
(+268) 2404 3539
Fax: (+268) 2404 4521

P.O. Box 69
Mbabane
Swaziland

29th May 2023

Rhodes University
P.O. Box 94
Grahamstown 6140
SOUTH AFRICA

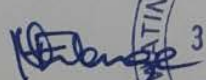
Dear Ben de Souza

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT ECOT

Reference is made to the above cited subject matter.

1. We acknowledge receiving your letter dated 24th May 2023 requesting to conduct research at **Eswatini College of Technology (ECOT)**, in particular observing lectures and conducting interviews and a workshop with teacher educators involved in **UNESCO's** Sustainability Starts with Teachers course.
2. We understand that such **UNESCO's** course also involves teacher educators at **ECOT**. Given our commitment in promoting internationalization and knowledge exchange, we are happy to grant you the permission to conduct your research at **ECOT** from June to August 2023.
3. While at **ECOT** you will be under supervision of Mr. Hlophe Bhekisisa the focal person of SST Team at **ECOT**. You shall also be obliged to adhere to National Laws as well as ethical principles as stipulated in your research clearance letter. As such **ECOT** will not be responsible for any misconducts therefore. Finally, you will be required to share your findings with the teacher educators and to the College upon completion of the study.
4. We look forward to seeing you at **ECOT** and hopefully discuss areas for collaboration between **ECOT** and Rhodes University

Yours Sincerely


NOMCEBO M.F. NHLENGETHWA
PRINCIPAL

Cc: HOF –Education
Senior Management Team



Appendix 13: Participant Invitation Letter



Rhodes University
PO Box 94
Grahamstown 6140
South Africa

4th November 2021

Dear Teacher Educator,

INVITATION TO PARTICIPATE IN A RESEARCH STUDY

You are invited to participate in a research study entitled Mainstreaming Inclusive Education in Teacher Education in the Context of Education for Sustainable Development: A Study in Change Projects from Southern Africa. The aim of this research is to investigate the issue of Education for Sustainable Development (ESD) and inclusivity within a comparative research framework in Tanzania, Malawi and Mozambique in order to support teacher educators design training programmes that enable teachers to develop relevant skills for inclusive education that complements sustainable development. Your participation is important to the development of indicators for monitoring inclusive, quality education in your institution and country.

The research will be undertaken through interviews, observations and workshops. Your participation in the research is anonymous and your identity will not be revealed. The collection of this data will require one hour for interviews and four hours for workshops. This will be done on separate days at mutually agreed times and places.

If you agree to participate, I will provide you with the information you need to understand the research. These guidelines would include potential risks, benefits, and your rights as a participant. Once this study has been approved by the Rhodes University Ethics Committee you will be sent the letter of ethical approval.

Participation in this research is voluntary and a positive response to this letter of invitation does not oblige you to take part in this research. To participate, you will be asked to sign a consent form to confirm that you understand and agree to the conditions, prior to any interview commencement and workshop participation. Please note that you have the right to withdraw at any given time during the study.

Thank you for your time and I hope that you will respond favourably to my request.

Your sincerely,

A handwritten signature in black ink, appearing to read 'Ben de Souza', is positioned to the left of a vertical line. The signature is stylized and cursive.

Ben de Souza

Rhodes University, Research Office, Ethics

Ethics Coordinator: ethics-committee@ru.ac.za

t: +27 (0) 46 603 7727 f: +27 (0) 86 616 7707

Room 220, Main Admin Building, Drostdy Road, Grahamstown, 6139

Appendix 14: Participant Informed Consent Form



PARTICIPANT INFORMED CONSENT

INFORMED CONSENT DECLARATION

(Participant)

Project Title: Mainstreaming Inclusive Education in Teacher Education in the Context of Education for Sustainable Development: A Study in Change Projects from Southern Africa

Ben de Souza from the Department of *Education*, Rhodes University has requested my permission to participate in the abovementioned research project. The nature and the purpose of the research project and of this informed consent declaration have been explained to me in a language that I understand.

I am aware that:

1. The purpose of the research project is to investigate the issue of Education for Sustainable Development (ESD) and inclusivity within a comparative research framework in Tanzania, Malawi and Mozambique in order to support teacher educators design training programmes that enable teachers to develop relevant skills for inclusive education that complements sustainable development.
2. The Rhodes University has given ethical clearance to this research project (***Ethics Approval Number 2021-4989-6408***) and I have seen/may request to see the clearance certificate by contacting Ethics Coordinator (ethics-committee@ru.ac.za).

3. By participating in this research project, I will be contributing towards development of indicators for monitoring inclusive, quality education in Tanzania, Mozambique and Malawi which will be shared by UNESCO Southern Africa.
4. I will participate in the project by (a) attending an interview (b) observed while teaching (c) participating in workshops.
5. My participation is entirely voluntary and should I at any stage wish to withdraw from participating further, I may do so without any negative consequences.
6. I will not be compensated for participating in the research, but my out-of-pocket expenses will be reimbursed. (*Costs for travel and lunch associated with participating in workshops will be reimbursed*).
7. The following risks are associated with my participation: time conflicts to participate in the study and attend to your daily routines. Mutually agreed time slots and days will be used to conduct the interviews and convene the workshops.
8. The Principal Investigator intends publishing the research results in the form of *doctoral thesis and journal articles*. However, confidentiality and anonymity of records will be maintained and that my name and identity will not be revealed to anyone who has not been involved in the conducting of the research, *unless I indicate to the contrary/recognise that as a public figure my identity will inevitably be/become known. (Agree/Accept loss of confidentiality)*.
9. I will receive feedback in the form of *follow up meeting (member checking) and e-copy of doctoral thesis* regarding the results obtained during the study.
10. I agree to the Principal Investigator's request to take photographs, or videoing me as part of this research project.
11. I agree to the Principal Investigator's use of voice recording of my comments and opinions during interviews.
12. Any further questions that I might have concerning the research, or my participation will be answered by *the supervisor, Dist. Prof. Heila Lotz-Sisitka (h.lotz-sisitka@ru.ac.za)*.
13. By signing this informed consent declaration, I am not waiving any legal claims, rights or remedies.
14. A copy of this informed consent declaration will be given to me, and the original will be kept on record.

I,, have read the above information / confirm that the above information has been explained to me in a language that I understand and I am aware of this document's contents. I have asked all questions that I wished to ask and these have been answered to my satisfaction. I fully understand what is expected of me during the research.

I have not been pressurised in any way and I voluntarily agree to participate in the abovementioned project.

.....

Participant's signature

Date

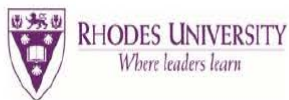
Rhodes University, Research Office, Ethics

Ethics Coordinator: ethics-committee@ru.ac.za

t: +27 (0) 46 603 7727 f: +27 (0) 86 616 7707

Room 220, Main Admin Building, Drostdy Road, Grahamstown, 6139

Appendix 15: Research Proposal Approval



● EDUCATION FACULTY
● CHAIR ● EDUCATION HIGHER DEGREES COMMITTEE
● PO Box 94, Makhanda, 6140
Tel: +27 46 603 8390 ● e-mail: h.lotz-sisitka@ru.ac.za

18/11/2021

Ben Souza

c/o Distinguished Professor Heila Lotz-Sisitka

4989

Education Department

Dear Ben Souza

Re: Mainstreaming Inclusive Education in Teacher Education in the Context of Education for Sustainable Development: A Study in Change Projects from Southern Africa-4989 Nov 2021

This letter confirms that the Higher Degree Committee has approved your research proposal, for the degree of PhD in Education in the Faculty of Education titled: Mainstreaming Inclusive Education in Teacher Education in the Context of Education for Sustainable Development: A Study in Change Projects from Southern Africa

Comments from the committee include,

- * data from three countries may be too much (scope), perhaps focus only on two countries
- * comparative dimension of the study is not clear - there does not seem to be a need for comparative research

You will need ethical clearance from the Education Faculty Ethics Committee before you can begin your research. The ethics review process is underway and you will receive a separate outcome notification from the Chair: Education Faculty Ethics Committee.

Sincerely,

Heila Lotz-Sisitka (Ph.D.)

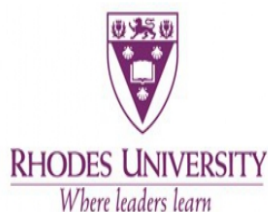
Distinguished Professor

Chair: Education Higher Degrees Committee

SARCHI Chair: Global Change and Social Learning Systems

cc. Mr Ben Souza

Appendix 16: Provisional Ethical Clearance



Rhodes University, Education Faculty
Research Ethics Committee
PO Box 94, Makhanda, 6140, South Africa
Tel: +27 (0) 46 603 8393
Fax: +27 (0) 46 603 8028
email: e.rosenberg@ru.ac.za

<https://www.ru.ac.za/researchgateway/ethics/>

18 November 2021

Ben Souza

Education Department

g19s0001@campus.ru.ac.za

Dear Ben Souza

Your application Mainstreaming Inclusive Education in Teacher Education in the Context of Education for Sustainable Development: A Study in Change Projects from Southern Africa, 2021-4989-6408 has been reviewed by the Education Faculty Research Ethics Committee [EF-REC].

Ethics approval has been granted pending the required Permission Letters being obtained from the organisation(s) listed in your application.

UNESCO Regional Office

Heads of participating institutions

Your application can be downloaded as a PDF version and forwarded with your permission letter request. Please refer to the Applicant User Guide for how to do so.

Please forward the required permission letter/s, once received, to the EF-REC Chair (E.Rosenberg@ru.ac.za) and to the Education Research Ethics Coordinators (g.chakona@ru.ac.za; d.devos@ru.ac.za) in order for your approval to be finalised.

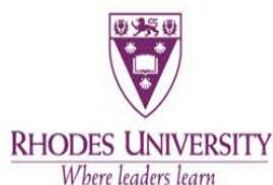
Sincerely



Professor Eureka Rosenberg

Chair: Education Faculty Research Ethics Committee

Appendix 17: Ethical Clearance Certificate



Rhodes University, Education Faculty
Research Ethics Committee
PO Box 94, Makhandla, 6140, South Africa
Tel: +27 (0) 46 603 8393
Fax: +27 (0) 46 603 8028
email: e.rosenberg@ru.ac.za

<https://www.ru.ac.za/researchgateway/ethics/>

3 May 2022

ben souza

Education Department

g19s0001@campus.ru.ac.za

Dear Mr Ben Souza

Re: Mainstreaming Inclusive Education in Teacher Education in the Context of Education for Sustainable Development: A Study in Change Projects from Southern Africa

APPLICATION NUMBER: 2021-4989-6408

This letter confirms that your research ethics application has been reviewed and **APPROVED** by the Education Faculty Research Ethics Committee (EF-REC). Your permission letter(s) where applicable have been received and you are free to proceed with your study.

Approval is granted for 1 year. An annual progress report is required in order to renew approval for an additional period. You will receive an email notifying you when the progress report is due.

Should any substantive change(s) be made during the research process, that may have ethical implications, you should notify the Education Faculty REC Chair via email. This includes changes in investigators. The REC Chair will advise as to whether a new application is necessary.

Do keep this clearance letter secure and accessible throughout your study and after its completion. It will be needed when a thesis is examined and when publications are submitted to journals.

Please also submit a brief report to the REC Chair on the completion of the research. This can be done via email. The purpose of this report is to indicate whether the research was conducted successfully and whether any ethics-related matters arose that the committee should be aware of, in order to guide future studies.

Sincerely,



Prof Eureta Rosenberg

Chair: Education Faculty Research Ethics Committee