DURBAN UNIVERSITY OF TECHNOLOGY

A Systems Approach for enhancing Entrepreneurial Leadership in Learning for Zimbabwe: The case of Hilbright Science College in Harare and Mutare

By

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Declaration

I, Blessing Machona, declare that:

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To my boys, in all labour there is profit. A man who is diligent in his work will stand before kings and not meek man.

Abstract

This thesis argues for Entrepreneurial Leadership as a key intervention in leapfrogging students to match the demands of the ever-changing complex environment. Present challenges include the churning out of school leavers and graduates that fail to meet the socio-economic, and the changing workforce demands. The argument made is that while many studies have concentrated on curricular transformation, these changes have failed to cope with a dynamic world that is volatile, uncertain, complex and ambiguous. The reality is that apart from the world being dynamically complex, it consists of multiple integrated and interrelated systems that are influenced by the deep underlying relationships, with feedback loops characterised by mutual and circular causality. In addition, Technology has not only continued to redefine boundaries and norms, but has also compounded the challenges of the complex environmental context which is nonlinear, open, recursive and emergent.

Using qualitative action research, Soft Systems Methodology and System Dynamics at Hilbright Science Colleges in Zimbabwe, this research used these interpretive systems approaches in exploring ways in which the curriculum could be improved for Entrepreneurial Leadership. Semi-structured interviews and focus groups were used to explore the underlying leverage points for intervention. Nine conceptual models for enhancing EL in learning were developed, and evaluated through focus group workshops. An evaluation of the conceptual models informed the participants of the dynamics of the interacting variables, interdependencies, feedback systems within the learning system and the deep leverage points that were most likely to produce desirable change.

This study proposes mainstreaming a ‘systemic entrepreneurial leadership’ approach in learning. A relook at the assumptions, beliefs and values coupled with teaching ‘for’ entrepreneurial leadership is proposed for influencing perspectives, pedagogy, and learning outcomes. This thesis confirms that system changes are non-linear, independent and emergent.

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CHAPTER ONE - INTRODUCTION AND BACKGROUND

1.1 Introduction

Entrepreneurial Leadership in learning is a key component for Zimbabwean education in an environment that is volatile, dynamic, complex, and ambiguous. The complexity has been created by the rapid changing industrial and technological environment which has created new possibilities and opportunities while at the same time rendering some orthodox careers obsolete. A closer look at the Ordinary level pass rates shows that an average of 77% fail to proceed to Advanced level education and subsequently to gainful employment (Zimbabwe School Examinations Council 2019). This is at the backdrop of a rising unemployment rate, and serious economic challenges where the youths are living barely below the bread line although the government of Zimbabwe has implemented reforms in the curricular to deal with inherent imbalances embedded in the inherited colonial education system. Recent studies show that future oriented education demands an enterprising learner, a global thinker with critical thinking, creativity, and innovation kills (Sellars *et al.* 2018; Spector and Ma 2019; Elder and Paul 2020). This has created a complexity and in turn placing new demands on the education sector, with the need to produce graduates that are versatile enough to match these ever changing demands. In response to these demands on the part of the education sector, this thesis applied Systems Thinking at Hilbright Science Colleges in Zimbabwe to enhance entrepreneurial leadership skills for the education sector in Zimbabwe.

1.2 Background to the study

My interest in entrepreneurship was incited by the work of Davison (2011). Davison traces the evolution of economies from the Agricultural, Industrial, Economic, Information age, and argues that the next evolution will be anchored on entrepreneurship that is underpinned on Systems Thinking.

Further study showed me that the idea of enterprise or entrepreneurial learning was a global phenomenon that was also gaining traction. Tracing it, I discovered that it was at the centre of international conferences and reports beginning with the Organisation for Economic Cooperation and Development (OECD) in 1989 (Ball 1989). In 1996 the European Training Foundation (ETF) had a conference which also emphasised on this theme. Beyond 2000, interest in this area gained momentum and there is a substantial body of literature in this area since then (Rieckmann 2012).

Of particular importance was that although different scholars did not agree on what the definition of enterprise education was, common trends could be drawn. I found the thrust in enterprise learning better summarised by Gibb (2008: 5) who defined enterprise learning as:

> The process which supports and stimulates behaviours, skills and attributes which are applied individually and/or creatively to help individuals and organisations of all kinds, to create, cope with and enjoy change and innovation involving higher levels of uncertainty and complexity as a means of achieving personal fulfilment and organisation effectiveness.

This definition got me thinking about how we perceived entrepreneurship at my institution. Being a principal at a college which specialises in the teaching of sciences and commercials to high school learners, four points struck me from Gibb's definition. First, that it embraced attributes, skills and behaviours which had a universal scope of application. This was mind boggling as I had always considered enterprise learning a preserve of Masters in Business Administration (MBA) level and new venture creation. Second, the purpose or aim was somewhat clear, and comprehensive in that it was forward looking (creative part) and adaptive (enjoying change). Third, pedagogy was considered as the vehicle or the means by which this entrepreneurial attitude could be achieved. Fourth, although I was quite familiar with the word uncertainty and how it is 'loosely' used, I had not understood the notion of complexity as it is applied in Systems Thinking (ST). As my understanding of ST began to grow, the word uncertainty got new nuances. And this point of the definition got me thinking on how we as educators in my context, were blind of complexity and ST which will be described later in this thesis.

Speaking of complexity, it was interesting to note that much of the change towards enterprise learning was motivated by dynamic economic changes. According to Davis and Sumara (2006), globalisation came with increased international competition. It created a lot of economic and social uncertainty therefore generating the need for a workforce that was flexible and opportunity seeking. The associated impact of these changes on the education system was that there was need for creating from students a workforce to match the demands of the ever-changing complex environment. An important study by Kirby (2004) highlighted that there was need to stimulate entrepreneurial imagination so as to create individuals with the ability to optimise opportunities.

At the backdrop of these global realities, my attention was drawn to my Zimbabwean context. The biggest question I had in mind was whether we as educators were ready in our teaching and learning for this global setting and the changing demands. Literature indicated that there was a churning out of graduates who lacked innovative entrepreneurial capabilities (Nherera 2000). This seemed to be a common problem among developing nations as similar observations were echoed later (Kanyongo (2005) Chitamba (2015). In trying to offer an explanation for this deficiency, various studies attributed it to failures in education systems. For example,

Kanyongo highlighted that the teaching methods which are still applied to date, were entrenched in the colonial education system of educating for paid employment and white-collar jobs. Resultantly, this has failed to prepare school leavers to cope with the complexity in the world of work. Baah-Boateng (2015) argued that issues of unemployment, economic melt-down, and poverty in developing nations were 'sign posts' of arch-deficiencies in the education system.

The argument of Baah-Boateng got me thinking about the relevance of our own curriculum in Zimbabwe. A consideration of related data from Zimbabwe Statistics Agency (Zimstats 2014) Labour Survey report indicated that 94% of those employed were 'informally employed' and 86% of them were unskilled. For those who were employed, evidence indicated that there was a weak correlation between competencies required by the productive sector and the tertiary institutions' curricula. With such confirming evidence, the relevance of enterprise education which I discussed earlier became justified. In this context of high unemployment, and growing number of those informally employed, my mind was also drawn to leadership as another important learning aspect also given that there was a push for 21st century learning globally. According to (Lackéus *et al.* 2016), 21st century learning demands learners who are critical thinkers and problem solvers; collaboration and leadership; agility and adaptability; initiative and entrepreneurialism; accessing and analysing information; lastly curiosity and imagination.

The implications of the 21st century demands do not only have an entrepreneurial flair, but also serious leadership connotations. In addition to the enterprising traits, it is clear that there must be transformation of the learners' attitude and dispositions to adapt to change and uncertainty. In light of the globalisation previously mentioned, there is also need to foster character traits in learners that make them functional in cross-cultural and global settings exhibiting open-mindedness, multiple perspectives and intellectual autonomy. This calls for learners who are autonomous and at the same time be capable of influencing others. To that end, the demand for both entrepreneurship and leadership skills becomes imperative. The term Entrepreneurial Leadership (EL) shall be constantly referred to in this thesis and is defined in the literature chapter.

1.3 Statement of the problem

From a Systems Thinking perspective, the term 'problem situation' is preferred over the word problem. Systems thinkers reject the notion that a problem can easily be defined, has very few players, its boundaries are clear, the problem can be structured well, and a solution can easily be found. Systems thinkers argue that problems take different trajectories; have multiple players, different perspectives, they are complex, ill-defined and thus difficult to pin down with a single solution (Sterman 2000a; Meadows and Wright 2008; Cundill *et al.* 2012).

The problematic situation as perceived is that Learners who leave High School seem to lack the soft skills of Entrepreneurial Leadership skills which will qualify them for a world of work, life and complexity. The emerging challenge of the problem situation becomes, "how can we improve the entrepreneurial and leadership skills of the learners 'for life' and 'for work' under conditions of complexity, and uncertainty?" As the reader will note, this two-tier problem statement is premised on the assumption that symptoms are usually indicators of deeper underlying issues. The reason for this is not clear, but it may have something to do with the failure of the education system to deal with the soft issues related with imparting these requisite skills. If this situation is not addressed, this could negatively affect creativity, and innovation in the learners, resulting in learners who have a high dependency mentality who will not be able to leverage their knowledge for practical life and relevant problem solving. This situation seems to be deeply entrenched in long held learning culture, beliefs and value system. Furthermore, given the global recession caused by the Covid-19 pandemic, and Zimbabwe's serious economic challenges, the problem has become rather complex and messy to the end that quick fixes will not work. What is required is deeper understanding of the dynamics of the learning system in order to seek viable leverage points to improve the mess. The narrative of the pass rate statistics becomes more interesting when viewed using the dynamic thinking concept. In dynamic thinking, four critical questions are raised:

1. What is the behaviour of the problem over time?
2. Why has it behaving that way?
3. What are the potential challenges?
4. Why intervene in the problem and where would the intervention be?

These questions are foundational in defining the problem situation in this context, and to bring them into context, a snapshot of the statistics of pass rates from Zimbabwe Schools Examination Council (ZIMSEC) is presented in Table 1.1.

Table 1.1: Ordinary level National Statistics by Gender

	Time (Years 2015-2019)					
YEAR	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Females	18.76	25.33	27.84	26.85	30.04	30.57
Males	27.23	30.47	32.13	30.63	32.35	32.96
National Pass Rate	23	27.9	29.96	28.74	31.20	31.77

Source: Zimbabwe School Examinations Council (2019: 9)

Although there are three types of reports covering grade seven, Ordinary level and Advanced level, the ordinary level statistics in Table 1.1 have been chosen because of their relevance in determining whether the student will proceed either to advanced level or entering to the world of employment. According to the ZIMSEC statistics, a person is considered to have passed after obtaining a grade C or better in five subjects or more. A closer look at the flip side analysis of the failure rates from Table 1.1 shows a very interesting narrative. Given that 23% passed in 2015, this implies that 77% could not make it either to Advanced level or to get a gainful employment on the basis of their education. The years after 2015, the failure rates were 72.1%, 70.4%, 71.26%, 68.8%, and 68.23% respectively. I am however, fully conscious that there are repeaters who will try and retake their examinations in order to make the grade. The statistics of repeaters is very complex, and also the ZIMSEC report shows that very few do repeat. Using the dynamic concept, this implies that over the years there is an average of 71.3% annually that fail to proceed with their education. These statistics reveal that the accumulations over the years of those who have failed is increasing. Sweeney and Sterman (2000) present the bath tub concept a useful tool in analysing accumulations and the behaviours of systems over time. They present three scenarios:

1. Where the inflows are equal to the outflows as in a bath tub, there accumulations have no impact.
2. Where the inflows are less than the outflows, there is a subsequent decrease in the stock accumulations.
3. Where the inflows are greater than the outflows, then the stocks of any variable that is being analysed increases.

Subjecting the ZIMSEC pass rate statistics to (Sweeney and Sterman) bathtub model shows that there is an accumulation of learners who are rendered ‘useless’ by the education system. What compounds this problem is that Zimbabwe has a chronic unemployment challenge. An analysis of unemployment and informal entrepreneurship by Mujeyi and Sadomba (2019) showed over 90% of the employable population are absorbed in the informal sector. Such evidence and the analysis from Table 1.1 are an iceberg indicative of the systemic challenges in education and that there is need to start asking questions around Entrepreneurial Leadership.

1.4 Purpose of the study

This study uses Soft Systems Methodology (SSM) at Hilbright Science College, to explore how teaching and learning could be enhanced for Entrepreneurial Leadership in global environments that are complex and dynamic.

1.5 Research objectives

In order to pursue the broad aim of enhancing EL in learning, it was imperative to break it down to the following research objectives:

1. To establish the relevance of Entrepreneurial Leadership thinking to Zimbabwe's socio-economic development.
2. To establish the systemic forces in the existing education system which are impeding the kind of education which is appropriate for the emergent age.
3. To explore how Systems Thinking can inform Entrepreneurial Leadership in learning.
4. To assess the challenges faced by schools with regards teaching Entrepreneurial Leadership.
5. To explore the strategies and mechanisms that the education sector can employ to embrace entrepreneurial leadership teaching in Zimbabwe.

1.6 Significance of the study

The contributions of the study can be explained in three ways. First, this study informs literature of EL. The main theoretical contribution of the study will be the use of systems thinking approaches in equipping learners with Entrepreneurial Leadership (EL) skills for a complex and dynamic environment. Using Soft Systems Methodology, the thesis proposes a model that will be useful as an intervention in the education system in order to improve EL. The chosen methodology SSM, offers both insightful and relevant problem structuring methods. The expression of the problems particularly in learning through the use of the rich picture is indeed valuable. The application of the intellectual models in the form of the root definitions, and the conceptual models demonstrated that SSM offers a robust methodology both of improving any given problematic situation. (A scenario is a hypothetical view of a plausible possible future). This contribution can therefore be applied to other related theories of teaching and learning, even in leadership and administrative roles.

The practical contribution of the study are the results from the application of the recommended improvements to the management of Hilbright Science College of Harare Zimbabwe. It is my hope that this led to improved mental models and change in the teaching and learning process. I also do not doubt that the same recommendations will help the MoPSE in the implementation of the changes in their curricula. Citing the resistance that the ministry faced in implementing curricula change in 2016, I am persuaded that the inclusive approaches offered by systems thinking would offer accommodations that were both feasible and desirable.

To the best of my knowledge, it is the first time SSM and EL in learning and teaching has been studied in Zimbabwe. The use of the systems thinking tools especially the deep leverage points by Meadows and Wright (2008); (Abson *et al.* 2017), and the recommendations using SSM and System Dynamics was a unique synthesis of techniques.

This study has major implications for all institutions of learning. This includes teacher training institutions, universities, high schools, primary schools and early child development learning centres. For Africa, the development trajectory is anchored on a workforce who can approach issues holistically and entrepreneurially. For Zimbabwe, this study offers a bouquet of alternatives in place of the colonial mentality of education for employment. I argue that the recommendations in this study provides that aspects of continuous learning, iterative evaluation and change that is needful for a changing environment. A changing environment demands a changing workforce, and this change is embedded in the teaching and learning approaches.

1.7 Delimitations and scope

EL is a broad discipline which has been studied in various disciplines. The scope of this study was limited to EL in teaching and learning, more specifically at secondary school set up. Although the application of EL was applied at a secondary school, I assume that it can be applied at Universities and other institutions of learning. I did not place emphasis of the attributes of EL, as in finding out the most ideal for students at high school, rather, on improving for these EL attributes. As will be noted, the models that were proposed for implementation were not applied and evaluated, this is proposed for further study.

There are various systems thinking methodologies, which are outlined in the literature review section. It is beyond the scope of this study to critique each methodology. Only justifications for the methodologies used and their limitations are given. If another methodology was applied, the results as presented would have taken a total different trajectory.

The study was conducted in Harare and Mutare, two major cities of Zimbabwe. The field of study were the four institutions of Hilbright Science College (HSC), three Located in Harare and one located in Mutare. HSC is a private school which specialises in the teaching of science education in Zimbabwe. Each campus is an autonomous unit run by a principal who reports to the head office headed by the Chief Executive Officer. Key informants, and players in the education sector included representative participants of students (15-21yrs), parents, teachers and principals, and MoPSE representatives. Sampling and the composition focus groups are discussed in the next section.

1.8 Limitations

No research is without limitations. A study of institutions from the 10 Provinces of Zimbabwe would have yielded better results, however, it is not feasible and the geographical selection of the sample, and the sample selected in the study shall be deemed to be representative. The researcher is funding their own studies and given the current economic conditions, financial constrains are inevitable. The study is shaped by the researcher's world views and experience, furthermore will seek an in-depth study only those aspects that are related to the objectives.

1.9 Structure of dissertation

Table 1.2: Structure of Dissertation

Chapter	Content Summary	
1	Introduction	The chapter provides an overall account of the research, with the background, the problem statement, aim of the study, the research questions, the significance of the study and the rationale for the study.
2	Contextual chapter	The chapter provides a background of the context of the study. It traces the genesis of enterprise learning and related challenges from the global perspective, and in Zimbabwe.
3	Literature Review	The chapter presents academic perspectives and theories on SEL and ST, a critique of existing literature and identifying gaps, and the contribution of the topic to the body of knowledge.
4	Research Design	This chapter presents and outlines the research design and the methodology used in the collection of data, justification and analysis process, the population, sampling, ethical and validity considerations.
5	Application of Soft Systems Methodology, System Dynamics, Learning and Proposed Interventions	Results, Interpretation and application of findings.
6	Conclusions, recommendations and suggestions for further research	Concluding remarks.

Source: Author

1.10 Chapter summary

The idea of change in education is not something that can be debated given the complexity prevailing in the global landscape. This thesis takes the argument that problems in this landscape including the challenges specific to the Zimbabwean learners are messy, ill-defined and thus difficult to pin down with a single solution. This chapter provided the background and the motivation behind this study. In summary, it has been shown that globally the notion of an enterprising learner is gaining traction. It also highlighted that there is need to empower the learners with the requisite soft skills that empower them to navigate the complex landscape and also be fit for life and the world of work. This chapter demonstrated that the study of entrepreneurial leadership is significant for Zimbabwe's socio economic changes and landscape. In tandem with the different change trajectories, the multiple players, and the different perspectives in education. It is important now to look at the challenges that are embed in the systems of education from a global perspective and the ones that are specific to the Zimbabwean context.

CHAPTER TWO - CHALLENGES IN EDUCATION SYSTEMS

2.1 Introduction

This chapter provides a background to the challenges that are embedded in the education system in general, and Zimbabwe in particular. It begins with exploring how the global education system is grappling with change. It demonstrates how Enterprise learning and Entrepreneurship have been considered as interventions for the dynamic changes. This is followed with a review of the challenges being faced by Zimbabwe in particular. In order to explore the challenge of Entrepreneurial Leadership learning challenges specific to Zimbabwe, this chapter provides the historical progression and development of the education curriculum of Zimbabwe. It highlights the challenges, the strengths and the opportunities that the current curriculum presents.

2.2 Global challenges in Education systems

Globally, education systems are overwhelmed with the challenges of educational reforms that equip learners for a more complex world (Fletcher Jr, Warren and Hernández-Gantes 2018; Malik 2018; Hays and Reinders 2020). The rapid changes in technology and the expansion in knowledge had mutual evolutionary effect on work processes and the socio-economic environment. Consequently, education systems have to 'close' the gaps emanating from the challenges and opportunities presented by the dynamic world and the unpredictable future (Farley-Ripple *et al.* 2018). Behind this great uncertainty, the role of education and its contributions in promoting quality learners with the requisite skills has been questioned.

Key considerations in considering entrepreneurship were:

- At what point in the education system should it be introduced?
- What content should be taught, and how it must be taught?
- If it has to be taught from early stages of the learning system, what will be the purpose?

These questions come at the backdrop that entrepreneurship and leadership have not been taught at junior level, and have at times been delayed until postgraduate studies. The underlying assumption of proponents of the delay of entrepreneurship to post graduate studies, is that entrepreneurship is a preserve of new venture start-ups where business acumen and skills are a prerequisite.

Recent developments in education seem to be moving towards the concept of an enterprising child (Gibb 2002; Brunila and Siivonen 2016) Unlike the traditional approach were enterprise learning is deferred to postgraduate studies, proponents of this concept argue that a foundation for an entrepreneurial character must be laid. In addition, 'seeds' of an entrepreneurial mind-set are sown, and nurtured at early stages of the learning continuum. In light of the increasing complexity, the drifting skills requirements (Rojewski 2002), and the shift to service driven economies. The argument by Kromydas (2017) that there is increasing concern in rethinking the processes and the aims of the education systems becomes plausible. Apart from the challenges emerging from the changes in the context, globally, the education system is inundated with peculiar challenges. The following themes emerge from literature.

2.2.1 World view of learning

Different philosophies influence education systems globally (Davies *et al.* 2018). A leaf from Freire (2018) and his earlier work on Pedagogy of the oppressed, show that in developing nations, the emancipation notion seems to be embedded in most countries that were once colonies. While developed nations are guided by a different set of philosophical belief systems, they all appear to have common philosophical challenges. In their study of bridging the gap between traditional and progressive education, Lackéus *et al.* (2016) highlighted the philosophical challenges in traditional education systems. First, they argue that traditional learning takes a reductionist view to learning and reality. As emphasised in this thesis, reality is considered to be complex, and problems are ill-defined, messy and 'wicked' (Skaburskis 2008; Wright and Monsour 2020). On the contrary, from a traditional lens, reality is concrete, and predictable. What becomes clear is that there is need for a frame of mind that goes beyond the traditional approaches in solving evolving problems. The biggest question emerging is: are our systems of learning ready for this evolution in perception of reality? In addition, what are the measures being taken to promote the creative application of knowledge in order to match the changing demands?

2.2.2 Learning approaches

From the work of Kolb (1984) and Cheng, Chan and Mahmood (2009), challenges impeding entrepreneurial learning can be traced to the teaching approaches. According to Van der Lingen, Åmo and Pettersen (2020) there is a strong correlation between pedagogy and entrepreneurship. One major weakness that has been cited is that of teacher-centred knowledge. Challenges arising from this approach are that students become too passive. In most cases, interaction, students' participation and engagement depends on the teachers' expertise to mainstream these critical learning approaches. Under such conditions, there is very little that is done to create a conducive

motivating environment to learn. Evidence indicates that in this approach, the 'one-size-fit-all' approach is mostly used. Research shows that innovation, curiosity, and creativity (important aspects of entrepreneurship) are stunted in such scenarios.

Another factor closely linked to the teacher-centred approach is the completion of syllabus targets. This is worth noting as it 'pushes' the teacher into the exam mode. In this mode, all learning is oriented towards good grades than the practical utility of knowledge. What this means is that the possibility of leveraging the knowledge acquired for practical use is most likely to be very limited. In this mode, there is a quest for high scores and the high promotion of individualised success or the genius mentality. To that end, much emphasis is placed on rote learning, where learners will only concentrate on cramming, retention, and regurgitation. What is clear is that optimal use of the brain and realisation of his full potential is greatly affected. This points to the need to regain the missed potential which only effective pedagogy can provide. Learning must be perceived to go beyond obtaining a certificate. This implies that there is need to stimulate learning approaches which places learning as an integral part of life.

2.2.3 Limited learning outcomes and learning goals

Although the exam-oriented approach has benefits, there is more to learning than mere certification. Another major weakness of the traditional learning approach is that all learning converges to the concept of 'one correct answer.' This is contrary to the modern learning methods which promote the appreciation of multiple perspectives. If the traditional learning must overcome these impediments, then the 'hedges' and the blinkers which promote a single world view, and a linear way of thinking must be dealt with.

Current trends in education seem to favour aspects as leadership; agility and adaptability; curiosity and imagination; initiative and entrepreneurialism over the traditional skills bouquet (Research 2014; Anderson and Staub 2015). In support, Kivunja (2014) found that skills which were applicable in highly compartmentalised and specialised Industrial Age economies are no longer applicable. The 21st century context rather required skills that looked beyond the local thrust to a more global perspective. The implication of this view is that learning is not defined by and restricted to the classroom, but goes beyond it.

Also, the notion of success in learning, as being measured by the effectiveness of the student beyond the certification, brings a new perspective and redefines the traditional assessment criteria. For Taranto and Buchanan (2020), the idea of a 'life learner' approach, where the notion of learning is seen as a continuum

contrasts the perception that many students in developing nations of 'arriving' after completing their Ordinary Level certificate.

At the global level, it is clear that there is need for meaningful reforms in both curriculum and pedagogy in order to leverage on learner's creativity in their conceptualisation, application and transfer of knowledge. Learning instructions should be strategically couched in order to provide good scaffolding for an enterprising mentality and culture. While, the challenges on the global front are real and worth tackling, when they cascade downwards, they take new nuances.

In the following section, I will discuss the challenges in Zimbabwe in general and those specific to the case in relation to entrepreneurial leadership.

2.3 Educational Reforms and Entrepreneurship in Southern Africa.

In looking at the reforms of education in Zimbabwe, it may be relevant to trace the entrepreneurial agenda across the neighbouring Southern African Development Community (SADC) countries. The SADC comprise of 16 countries of which seven Anglophones (Malawi, Zimbabwe, Zambia, Namibia, Tanzania, South Africa, and Lesotho), one Francophone (Democratic Republic of the Congo), two Lusophones (Angola and Mozambique), and lastly Mauritius, and the Seychelles. Apart from sharing a common economic and political objectives as bound by their SADC charter, these countries also share a common thread of distortions and imbalances in their education system emanating from the colonial regimes.

Talking of the pre-independence challenges, Walt, Potgieter and Wolhuter (2014) noted the existence of bottlenecks in education. Education was for a targeted minority (Christie 1991; Kanyongo 2005). At the Higher Education strata, Sibanda and Young (2020) described the limited access by Indigenous Africans as somewhat wafer-thin or technically never in existence. As posited by Shizha and Kariwo (2012), there was a two-tier system, with inferior education targeted for the poor natives. In describing the imbalances, Walt, Potgieter and Wolhuter (2014) sum it well by highlighting that the education which was provided to natives was only sufficient to fit into the subservient positions in the colonial rubric. Due to these imbalances, expanding the access to education to all, and improving the quality of education was embedded in most colonised states.

Of course significant progress post-colonisation cannot be ignored. According to (Kanyongo 2005) there is greater access to education for all. Efforts have been made to improve the quality of education including equitable budget allocations and intensive teacher training programs (Walt, Potgieter and Wolhuter 2014). For Zimbabwe, it can be argued that while it was swamped in correcting the colonial imbalances that very little attention was given to the improvement of the pedagogy towards enterprising.

In spite the reforms across the SADC region in education, (Johnson, Hirt and Hoba 2011) argues that much of the sub-continent endures political instability, poorly contextualized reform initiatives, and disease. Again, they posit that institutions of higher education face brain drain, crumbling infrastructure, an ever-expanding student population, and reduced funding. In the case of Zimbabwe, the socio-political landscape, including the deification of the former president which Ndlovu-Gatsheni (2009) referred to as Mugabeism. This, coupled with land grabs and the subsequent targeted sanctions eroded the positive strides that had been gained in education. Not only has the country suffered significant brain drain, also, a lot of companies especially the manufacturing companies moved their head offices and production lines to neighbouring South Africa.

Post-colonial tertiary reforms in Zimbabwe included among them Education 3.0 focusing on research, teaching and community service. Later progressed to Education 5.0 whose focus areas were research, teaching, community service, innovation and industrialisation. As argued by Murwira (2019) there was need to contextualise higher education to address the needs that were context specific to Zimbabwe. Thus the genesis of innovation industrialisation through innovation hubs and industrial parks in universities (Ministry of Higher and Tertiary Education 2018a). According to Muzira and Bondai (2020), the expectations of Education 5.0 were to produce graduates who had entrepreneurial skills, equipped as industry makers and not job seekers. Although reforms in tertiary education for Zimbabwe in the context of Education 5.0 tips towards entrepreneurship, however at primary level the closest reforms were Education with production.

2.3.1 Implications of the Pedagogy of the Oppressed.

A closer look at the reforms adopted by the SADC countries resonates well with the work of Freire (1995), on Pedagogy of the Oppressed. Drawing from his lived experiences Freire highlights the existence of classes and power imbalances. Through class analysis, Freire noted the existence of marginalised societies struggling against colonialism with education used as a vehicle of oppression. In highlighting the struggle, Freire coins what he termed the culture of silence, describing how the marginalised class were robbed of their critical voice to the concrete realities of life. In order to deal with what he calls dehumanising aspects in the oppressive pedagogy, Freire for an attitude of critical awareness, an attitude of learning to perceive the contextual realities and decisive action against the oppressive realities which he referred to as *conscientizacao*. Again, Freire condemns the banking concept of education and argues that the more learners are exposed to this model, the less they develop critical consciousness skills. In summing his argument he advocates for a problem-posing model of education as a means of stimulating creativity, inquiry, engagement, and participation in problematic reality.

The challenges cited by Friere still remain among the preoccupation of global education reforms. As argued by Klees (2018), there is need to reshape thinking, practice and educational policies. There is need to disentangle education from cultural and ideological hegemony, Pierce (2015) and the associated neo-colonial evils.

2.4 Zimbabwean educational landscape

In conceptualising the challenges Zimbabwe is facing, it may be important to approach it with this question in mind: what has been done in the education system in order to promote an entrepreneurial mind-set and culture? Zimbabwe is a former colony of Britain, and it attained its independence in 1980. This is pivotal in that it provides insights on the interests behind the education system prior to independence. A point to note is that the political, economic and commercial interests of the colonial powers were perpetuated through a system of education that protected and served their interests. For example, according to (Taranto and Buchanan 2020) natives were supposed to be educated enough only for labour purposes. This point is significant in the sense that the trust of this outcome was literacy. The measure of literacy was one's ability to read and write. A closer look at underlying this objective was the need to bridge the communication impasse between the natives and the whites. It is important to highlight that although literacy is good, there is more to education than the ability to read, write and communicate. As noted by Kanyongo (2005), the curriculum was structured in manner that would produce a docile and subservient workforce. Studies by Shizha and Kariwo (2012); (Muzira and Bondai 2020) share similar ideas. Of course this stems from the extensive work by Nziramasanga (1999) In that regard, it becomes clear that the challenges in the Zimbabwean education system were deeply entrenched in 'systemic' design imperfections.

In discussing the challenges, my focus of interest was guided by the objectives of the study specifically, identifying the opportunity areas where the idea of entrepreneurial leadership could have been missed. This choice in the scope is given in the backdrop that there is a sufficient body of literature (Nziramasanga 1999; Nherera 2000) which deals with the general challenges in the education system. These studies, however, provided a rich scaffolding in investigating this problem.

Given the oppressive challenges embedded in the education system, and the corrective measures that sought to 'emancipate' the disadvantaged natives, my mind was drawn to the critical systems heurist developed by Ulrich (1983). According to Werner, Critical Systems Heuristics (CSH) is a philosophical framework which supports reflective practice using a set of 12 questions to make judgements and to understand situations that affect our everyday life. This heuristic gives a deeper understanding of problem boundaries, and has proved to be a helpful tool in designing systems for improvement.

2.5 Pre-Independence challenges

An important point is to raise critical questions around the current purposes of education. A proper understanding of the emerging demands and trends in education will help us have a sense of orientation of the problems embedded in the education system in Zimbabwe. Recent trends in education are anchored on entrepreneurial learning. At the centre of entrepreneurial learning is the enterprising child. According to (Guadagnoli and Lee 2004{Baker, 2005 #423; Gibb 2008)}, such a learner is defined as an individual with the ability to turn ideas into action. From the definition, a universal practical utility is implied. Furthermore, the European Commission also included aspects of creativity, innovation, risk-taking and effective execution of tasks which are critical for an entrepreneurial mind-set. This view of the learner brings relevance not only to his being as an individual, but also to the associated outcomes. In addition, there are immense practical relevance to home, society and the future of work. A closer look at the pre-independence and even the post-independence curriculum shows that the Zimbabwean education system is not aligning to this trending thrust.

Kanyongo (2005) found that due to the skewedness of the pre-independence education system, challenges of inequality, unfair access and resource allocation were the norm. Perhaps the down side of this model was that it was geared for paid employment and white-collar jobs in one group, while the other was prepared for leadership. In addition, it did not adequately prepare students for the world of work (Nherera 2000). Compounding to these problems, the curriculum and pedagogy were designed for mind control. Bacchus and Bacchus (1994) noted that colonial education was targeted at creating a feeling of psychological inferiority, subservience and a passive mentality. In that light, creativity, innovation and critical thinking in learners was seriously stifled. Furthermore, the idea of enterprise thus suffered a ‘still’ birth.

After Independence, the Government of Zimbabwe (GoZ) implemented various corrective reforms in order to mitigate the imbalances that were embedded in the pre-independence education system. The first of such reforms was Education with Production (EWP). As posited by Shizha and Kariwo (2012), the major goals of EWP were: to promote the socialist’s values and attitudes in pupils; decolonise the learner; bridge gaps between theory and practice; mental and manual work; and class work and real-life. According to Shizha and Kamuriwo (2012:78), EWP would provide a platform to merge academics and practice, thus merging the ideologies of polytechnic education and that of Paulo Friere’s (1985) work on the Pedagogy of the oppressed. While EWP never saw the light of day as it faced implementation glitches, its values were ‘entrepreneurial’ in nature. Future curriculum reforms would have been more interesting had the changes of EWP been implemented. It is probable that these values would have formed a good bedrock for enterprise learning in Zimbabwe.

From 1990 to 2001 the reforms concentrated more on the relevance and quality of education and training. Emphasis was placed on new approaches to content, technologies, teaching methodologies, and skills provision (Kanyongo 2005). Perhaps, Nziramasanga (1999) whose report was issued in 1999 stands out as one of the corrective reforms. This comprehensive report was significant and has been the informant to, and a reference point of all reforms that came after it. This report is subject of analysis in the following section.

2.6 Strengths, challenges and opportunities in the Nziramasanga Report

The Nziramasanga Commission, named after its chairperson was commissioned by the President of Zimbabwe to look at the challenges in the curriculum and propose recommendations. The commission, composed of technocrats from different disciplines, had very significant findings and insightful recommendations. First, the commission identified the following weaknesses with the old curriculum:

1. Lack of national values;
2. It did not regard virtues of self-reliance, entrepreneurship and business skills;
3. It offered little personalised development in natural talents and aptitudes;
4. It was exam oriented; and
5. It did not promote the teaching of mathematics, science, technology, vocational skills and indigenous languages.

Guided by these observations, the commission recognised the need to realign the objectives of the education system in particular its relevance, quality, and orientation (p. 233). Secondly, it noted that the rapid changes in the socio-economic environment demanded drastic changes in the philosophy, content and the thrust of the education (p. xxi). A need to impart higher order skills that met the demands of the 21st century and the future. It is interesting to note that the word entrepreneurship or entrepreneurial was not that common in the focus areas of the curriculum proposed for both primary school and secondary school. The six curriculum focus areas included:

1. Relating the education system to employment.
2. Imparting education for life and self-employment.
3. Ensuring a bias towards the study of mathematics, science and technical subjects including computer literacy from early stages of education.
4. Developing the unhu/Ubuntu philosophy.
5. Recommending specific policy initiatives on indigenous languages.
6. Proposing a new curriculum.

Source: Nziramasanga (1999: 234)

Not all of the NC recommendations can be rendered invalid. However, all reports have their downsides in the long-run. A closer look at the first two focus areas reveal that the committee made an assumption of a predictable future. The hangover of the mentality of educating for employment is evident. The report would have been more useful if the ideas of creation of opportunities, innovation and creativity were clearly defined in their curriculum focus areas. No one really knows whether this lack of definitional clarity was by default or by design. However, the implications of this oversight are far reaching. For example, the commission recognised that the average pass rate of those passing Ordinary Level was 23%, implying that 77% could neither proceed to Advanced level education nor to good jobs in industry. A closer look at this trend shows little variation, implying that the challenge of preparing learners for a life of usefulness still remains critical.

Regarding the emphasis on focus area number 3, it is important to note that the knowledge of science, technology, and mathematics is very critical. However, the arguments that the real world is not split up into school subjects becomes a relevant consideration. This idea is relevant in that it broadens the perception of the world and reality. From this stand point, an appreciation of the world as complex and integrated emerges. To that end, learners must be taught to think systemically, and face challenges from a multi-disciplinary, and interconnected approach.

Another observation is that this report was produced in a period where there was very little digital literacy including the vast improvements in digital media that has become a common characteristic of moment. The impact of ICT on the learning landscape cannot be ignored. According to the MoPSE report of 2013, most schools in urban areas had access to ICTs which illustrates that the question of digital literacy had been ameliorated. This means that there is need to focus on the optimum utilisation of ICTs for innovation and creativity.

Another claim by the commission was that vocational skills training would prepare learners for competence in the global milieu. The committee defined vocational skills to mean any education and training with the specific objective of developing pre-defined skills (Nziramasanga 1999: 5). What this means is that the purpose of multi-skilling was defeated, and that many who were trained for specific skills that would become obsolete.

Another challenge with the vocational training recommendation was that it was delayed to post basic education phase, thus rendering the efforts of creating a culture of entrepreneurship at grassroots level useless. Similarly, the decision to focus on single-subjects meant that students would miss the skill of multivalent logic that comes

with an integrated and connected learning approach. Amissah, Gannon and Monat (2020) highlights that multivalent logic recognises multiple outcomes and nuances, thus it becomes rather holistic in its approach.

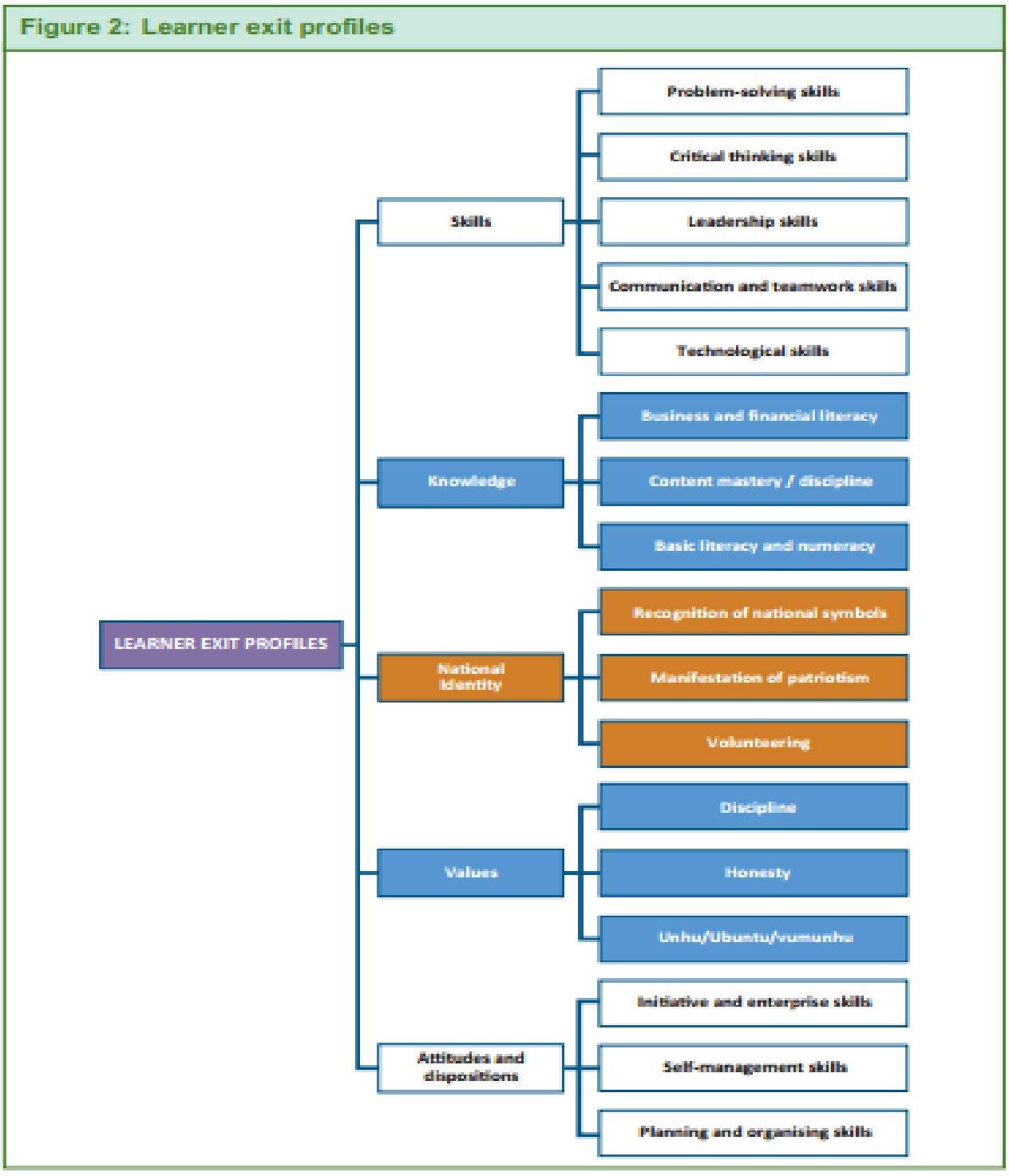
2.7 Curriculum Framework for Primary and Secondary Education (CFPSE (2015-2022)

After the Nziramasanga Commission, the Curriculum Framework for Primary and Secondary Education (CFPSE) was the next major update to the curriculum. The CFPSE was implemented effectively from 10 January 2017. While there were no curriculum reforms between 1999 and 2017, however, globally, many changes were taking place. For example, the internet gained more popularity, and the same period saw the advent of digital and social media platforms including Facebook, Twitter, Instagram, and WhatsApp. On the education front, the thrust towards 21st century learning was also gaining traction.

The CFPSE outlined the following for primary and secondary education: 1) what learners were expected to know, understand, value; 2) their learning experiences, and 3) the expected learning outcomes. The framework was predicated on a competency-based (outcomes oriented) curriculum which focused on the learners' capacity to apply knowledge, skills and attitudes in an independent, practical and responsible way. The framework was founded on 10 underlying principles: inclusivity; life-long learning; equity and fairness; gender sensitivity; respect; Ubuntu/Unhu/Vumunhu); responsiveness; balance; diversity; transparency; and accountability (Ministry of Primary and Secondary Education (MoPSE) 2015: 5).

The proposals of the CFPSE of exit profiles as shown in Figure 2.1 are quite robust. The research interest of this thesis was motivated by this profile listing. The framework clearly pointed out the critical issues of leadership, innovation and enterprise skills in the learner exit profiles.

Figure 2.1: Learner exit profiles



Source: Ministry of Primary and Secondary Education (MoPSE) (2015: 17)

While the CFPSE's recommendations of enterprise, leadership and innovation were good initiatives, however, this new curriculum suffered implementation challenges. In a review of the issues surrounding the updated secondary school curriculum in Zimbabwe, (Reniko *et al.* 2019) cited five challenges relating to implantation:

1. Lack of clarity of curriculum objectives;
2. Poor communication and orientation;
3. Poor consultation and stakeholder involvement;
4. Little buy-in from teachers specifically on issues that they considered to be laborious, for example the profile tasks the were proposed for each subject; and
5. Subjects were increased from five to thirteen at primary level.

This meant that there was pressure, not only on the teachers, but also on the parents as they were required to fund the stationery and resources that were required in the new curriculum. Although other aspects of the CFPSE suffered a setback, changes in subjects sailed through. For example, at primary level, family and religious studies, physical education and mass displays were added. At secondary level, heritage studies, physical education, and sports was highly emphasised. One would question the integrity of such a thrust given the global education trends, more specifically 21st century learning.

Secondly, while the issues of entrepreneurship, leadership and innovation were clearly outlined in the broader objectives, they were omitted in the learning areas, assessments and implementation. This means that the mentioning of entrepreneurship in the CFPSE was rather cosmetic.

In related studies, Sibanda and Young (2020) noted that while much was done to correct the colonial imbalances, sadly the elements of colonialism were still traceable in the postcolonial curriculum. According to Young and Sibanda, with respect to goals, content, pedagogy, assessment, classroom climate and organisation, and teachers' beliefs and attitudes, the postcolonial curriculum reflected and mirrored the colonial curriculum. Effectively, this means that there is much work still needed in revamping the curriculum to the demands of the 21st century.

Apart from the colonially inherited imbalances in the curricula, Zimbabwe is reeling under serious economic challenges, including among them; inappropriate economic policies, mismanagement, and corruption. In addition, inadequate financial resources, limited complementary capacity-skilled manpower, poor and deteriorating obsolete socio-economic infrastructure, drought, famine, and poverty are some of the economic factors that entrepreneurship needs to be reconsidered.

2.8 Entrepreneurship and Innovation in Higher and Tertiary Education

While the Ministry of Primary and Secondary Education (MoPSE) had the CFPSE, reforms in Higher and Tertiary Education (HTE) are embodied in its vision 2030 report. Originally, HTE was anchored on three objectives: Teaching, Research, and Community Service. Two objectives, Innovation and Industrialisation were added in coming up with what is now referred to as the 5.0. From the Minitsry of Higher and Tertiary Education (2018a), it is interesting to note that the aspect Entrepreneurship seems to be embodied in the Innovation objective in HTE 5.0. Although the idea of innovation is commendable, scholars have categorised it among the attributes of entrepreneurship (Pihie, Asimiran and Bagheri 2014). Thus, such lack of definitional clarity is most likely to hinder the entrepreneurial agenda. This is at the backdrop that there is now a growing realisation for the need to foster entrepreneurial education targeted at encouraging entrepreneurial development, skills, and awareness. While the move by HTE is positive, there are challenges of coordination and alignment between the MoPSE and the Ministry of HTE. In its 2013 report, the MoPSE highlighted,

> Pre-service teacher education is the responsibility of the Ministry of Higher and Tertiary Education, an arrangement that brings the advantages of association with Zimbabwe′s tertiary sector, but which presents challenges of coordination and alignment. The two education ministries continue to work through coordinating committee, an institutional arrangement that helps to promote alignment of pre-service and in-service training in Zimbabwe, but coordination challenges remain (MoPSE 2013: 26).

What is clear from this report is that the agenda of HTE 5.0, including that of innovation, will only thrive under effective alignment and coordination. As argued in section 2.6, a disconnect between the objectives of MoPSE and HTE is evident. Albeit that students from the former re channelled to the later.

2.9 The future of Learning in Zimbabwe

From the foregoing, the lack of entrepreneurial thrust in both primary, secondary and HTE 5.0 was enough justification for this study. From the analysis of the NC report and the CFPSE, three issues raised were not addressed:

1. How can the curriculum cater for the aspirations of self-reliance, entrepreneurship and senior leadership roles?

2. If the commission recognised that only 23% of students passed Ordinary level phase, implying that 77% were made redundant and neither fit for employment. What mechanisms were put in

place to cater for those who failed to go through the channel system of education? What reviews should be done in order to prepare these students for a world of self-reliance and enterprise?

3. What is being done in order to mitigate the challenge that was raised by parents in equipping pupils with practical, and entrepreneurial skills which would make them self-reliant and of social use?

To summarise, it is clear that the reforms in the education system did not address adequately the issue of entrepreneurial leadership. In addition, the aspect of 'how' the curriculum could be designed in order to cater for diversity, complexity and dynamic changes was not adequately covered. This leads me to one question, would a systemic improvement in learning with an entrepreneurial leadership thrust save the day? This question is at the core of this study.

2.10 Chapter summary

This chapter demonstrated that education systems globally are grappling with changes in the socio-economic landscape. There is a consciousness by practitioners of the need to improve the relevance of the education outcomes to match the demands of the changing landscape. I have also shown that Zimbabwe is not exempted from the challenges seized with the global education fraternity. Apart from these global pressures and demands, Zimbabwe has unique challenges in its own system which has not been addressed since it gained independence. Although there has been efforts to address the curriculum challenges which included among them inequality in education, little has been done to make education relevant for the marginalised poor to equip them with the requisite entrepreneurial skills. It has been shown that all reforms and attempts to restructure the curriculum have not been implemented fully and successfully. It becomes clear that there are much deeper challenges embedded in the education system. These challenges are proxies' signposting the need to investigate these sticking points of the system. This leaves Zimbabwe with a dual challenge of addressing its internal education system challenge and also aligning it to match the demands of the global future oriented education system. It therefore becomes relevant to look at how these challenges can be addressed and informed from a Systems Thinking lens. To that end, the next chapter discusses the theory that informed this study.

CHAPTER THREE - THEORY

3.1 Introduction

Having discussed the challenges embedded in the context of the study, in this chapter, I develop a conceptual framework based on current research and I frame it within a Systems Thinking mindset. The chapter begins with a brief outline of the process I adopted in conducting this literature review. The outline of this methodological process was to clearly outline how the emerging themes from literature, and the related issues informed this study. I then go on to introduce and explain what a Systems Thinking mindset is. An appreciation of ST is critical, because I will use it as my ontological and epistemological scaffolding. Having discussed ST, I will also explain why the currect education system in place is producing the current outcomes. I will also identify leverage points which will nudge the system in a different direction.

3.2 Literature review process

The literature review process began with a search strategy. At this stage, the key variables relating to the topic were listed. The variables included: Entrepreneurial Leadership, Enterprise Learning, Systems Thinking, Soft Systems Methodology, System Dynamics, and Education systems. The purpose of this exercise was to narrow the search process to the key concepts that were relevant to the study.

Having defined the key concepts and components of analysis, the second stage of the literature review process involved the literature search process in the data bases and search engines. The initial search criteria involved looking for papers with Entrepreneurial Leadership and Learning, and any peer review articles that had a combination of terms that was in line with my research objectives. Several research engines were used: Durban University of Technology Summon Search, EBSCO Host, and Google Scholar. Using the key variables, these search engines led me to other databases which include among them Springer, Emerald, Wiley Online, Elsevier Science Direct and Taylor & Francis. Other secondary sources of data which informed this study included books, dissertations and thesis from the school library and its online database.

The initial boundaries of the context of the search was initially set broadly in order to gain a deeper understanding of the dimensions of EL. Although this study focuses on EL in high schools, and in low income developing nations, it was important to look at EL at universities and in developed countries in order to appreciate how this

phenomena was conceptualised in these areas. After screening and sifting the titles, abstracts, and key terms, and context, the initial results of articles related to the topic were summarised as shown in Table 3.1.

Table 3.1: Summary of search results

Concept	**Context**	**Number of relevant papers**
Entrepreneurial Leadership in learning	Higher and Tertiary, High Income Countries (HIC)	46
	Higher and Tertiary, Low Income Country (LIC)	7
	High Schools, HIC	19
	High Schools LIC	6
	Other fields	49
Systems Thinking	Higher and Tertiary, High Income Countries (HIC)	8
	Higher and Tertiary, Low Income Country (LIC)	5
	High Schools, HIC	3
	High Schools LIC	0
	Other	65
Education Systems	Challenges in High Income and Low Income Countries.	41
	Forward Looking education systems	34
	Effective Learning strategies	22

Source: Author

As indicated in Table 3.1, there was limited literature dealing with Entrepreneurial Leadership in Zimbabwe. In addition, the diversity in the variables meant that I had to approach my LR using the scoping approach in order to have scientific rigor. Peters *et al.* (2015) highlight that the aim of the scoping review is to map the literature of a particular topic or research interest and to provide an opportunity to identify key concepts and gaps. In addition, it provides supporting evidence to inform practice, policy making and research.

The following stage involved reading and extracting the relevant information from the articles. In this stage, my initial interest was drawn first to Systems Thinking (ST), Soft Systems Methodology (SSM) and System Dynamics (SD), and related terms, including Complexity. The reason for this criteria was that I needed to have a deeper understanding of ST and the related tool kits because they were critical lens in the intervention process. Systems Thinking thus provided a tool kit which helped me first in thinking systemically. My focus in ST

involved understanding: the philosophy behind ST; what a system was; how the elements within the system were interrelated, interdependent and the dynamic influence among these elements as a complex whole.

Having understood Systems Thinking and its related methodology, I cascaded to Soft Systems Methodology, and System Dynamics. Although my interest was in SSM and SD, the remnant of the approaches were constantly referenced with a comparative mind and a quest for seeking the most appropriate tools that were relevant for this study. In order to remain focused in my area of interest, the concepts in SSM: problem articulation; rich pictures; human activity systems; and its application were searched linked to education and learning. In System Dynamics, my interest was in understanding feedback loops, why system changes fail, modelling, system archetypes, and its application.

3.3 Systems thinking as a new way of thinking

Although the systems of education in Zimbabwe has had several reforms as highlighted in Chapter Two, little attention has been placed on the system of knowledge outcomes. In this case, the system of knowledge outcomes refers to the intelligences and competencies that learners will leverage for change, work and life. My focus of attention is on these softer aspects of thinking with the notion of creating flexible intelligences that will help learners to navigate different terrains of the social and economic landscape. This section looks at the Systems Thinking (ST) framework with an idea of looking at possibilities on how this framework can transform the learners' thinking process. The assumption is that ST will be of benefit in improving thinking (software) and thus complement the operational reforms in the education system (hardware). My persuasion is that these reforms are mutually dependent and complementary. In that light, this sections looks at Systems Thinking as an alternative conceptualisation model. This section discusses: the key principles; what ST is; the word system; and other related ST principles and benefits.

3.3.1 Systems Thinking principles (background and definition)

Systems Thinking is a paradigm. A paradigm is a world view or lens of conceptualising reality. Kaushik and Walsh (2019: 1) defines a paradigm as "a comprehensive belief system, worldview and framework which guides research and practice." Worldviews are normally shaped by a mixture of the mental models, values, and knowledge, expertise and background experiences. According to Chalmers (2013), a paradigm has five components. Firstly, the theoretical assumptions and the laws of the paradigm must be explicitly stated. Secondly, the fundamental laws underpinning this paradigm must be applicable in a variety of contexts. Thirdly, it must have instrumentation and instrumental techniques for applying the laws of the paradigm. Fourthly, the

paradigm must be guided by metaphysical principles. Lastly, the paradigm must have methodological principles to guide the implementation of the paradigm. Systems Thinking meets this criteria as outlined by these five principles. Trochim *et al.* (2006) summarises how the ST concepts and methodologies have been applied in different contexts. It is from this rich heritage and development that this study uses ST in inquiring into reality and knowledge issues.

To begin, Systems thinking has been defined as "A general conceptual orientation concerned with the interrelationships between parts and their relationships to a functioning whole, often understood in context of an even greater whole." (Trochim *et al.* 2006: 539)
"Systems are constructs used for engaging with and improving situations of real world complexity" (Reynolds and Holwell 2010: 7).

A closer look at these two definitions shows that they can be differentiated on the area of focus or on the systems of interest. The definition by Trochim focuses on the system as actual real-world entities, while on the other hand Reynolds and Holwell focus on the systems as learning devices of looking at, and making sense of the real world, while both definitions have the aspect of an inquiry into the systems. However, the second definition goes further to consider the practical utility of the inquiry, namely for purposes of engaging with and making improvements in the system of interest. In this study, both definitions were of relevance in two ways. To begin, the first definition informed the conceptualisation of systems, most importantly the theoretical aspects underpinning the systems ideas. Then, the last definition helped in the application, specifically, Soft Systems Methodology (SSM), which was used in abstracting the research problems of this thesis.

ST ideas has a wide range of concepts and ideas. They include among them: holism or the big picture perspective, complexity, multiple perspectives, nonlinear frameworks and structures, mental models, causality, and leverage points, just to mention a few. These issues are discussed in the following sections.

3.3.2 Systems Thinking as an enquiry and learning methodology

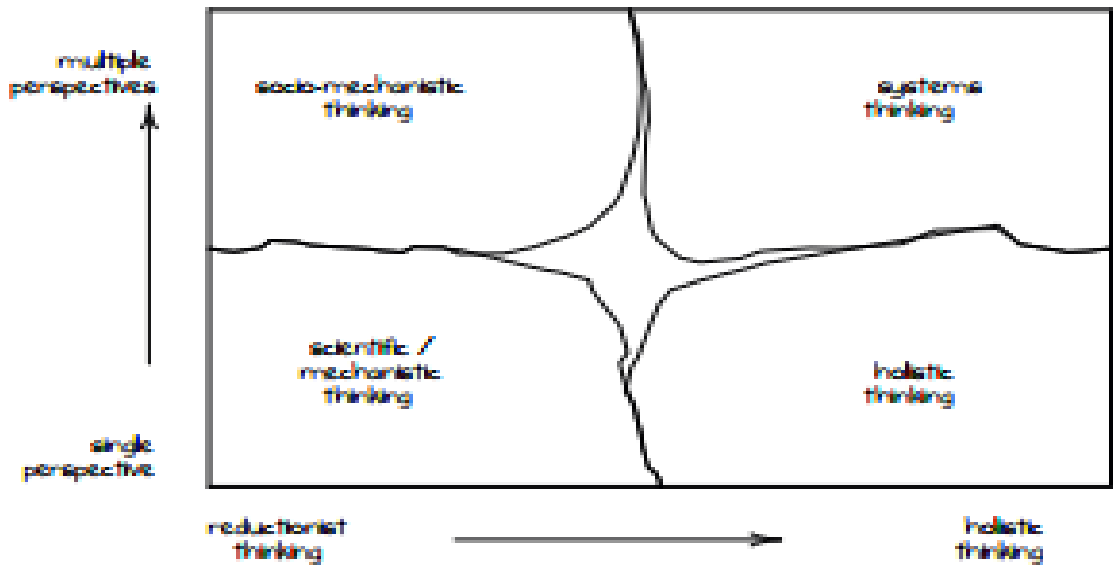
One important aspect of Systems Thinking is holistic thinking. Holistic thinking has been defined as a way of thinking which attends to 'wholes' and the relationship of that entity with its context. In his book, Growing Wings on the way, (Armson 2011a), paints a beautiful picture of what holistic thinking entails. The contributions by Armson are significant in the following: first, he highlights that

> Holistic thinking is neither better nor truer, than reductionist thinking, and reductionist thinking is nether better nor truer that holistic thinking. Holistic thinking and reductionist thinking reveal different features as complimentary ways of looking at the world (Armson 2011b: 32).

His view adds a new dimension, and implies that a systems thinker must exercise flexibility in the thinking. While reductionist thinking has been extremely effective in science in particular, there is a tendency for scientists, and social scientists to develop blind spots. Holistic Thinking provides the antidote to this and emphasises connectivity and its product, emergent properties. Similarly, Cabrera (2006) contributes an important point that all systems are equally complex, whether taken in the broader perspective or studied in isolation and microscopic sense. This is important in the sense that it contributes to the idea of balance in systems thinking. (Heifetz and Laurie 1997) brings another dimension of the 'balcony view' to this debate. This observation by Heifetz is significant because, it adds the vertical dimension to this idea of holistic thinking.

While joining the ideas of Abson *et al.* (2017), Cabrera (2006), and Heifetz and Laurie (1997) paints beautiful dimensions of Holistic Thinking, it still remains a fact that Holistic thinking is multi-dimensional and is comprehensive in its approach. This view helps one to move between views, and exploring the alternative views that may be presented from a combination of views. Such view is echoed by (Armson 2011a) who proposes a model which links multiple perspectives to holistic thinking as shown in Figure 3.2.

Figure 3.2 Perspective Mapping



Source: (Armson 2011b: 51)

In this model, Armson, positions systems thinking as incorporating all forms of perspectives, ranging from a single perspective to multiple perspectives and from reductionist thinking to holistic thinking. In fact, in

positioning ST, Armson recognises that a ST frame of mind acknowledges the strengths and limitations of each thinking style. He further argues that skilled systems thinkers will move consciously between different thinking styles to gain new insights. The advantage of this model is that limitations of all viewpoints are explored and the best possible alternatives or options are also discovered.

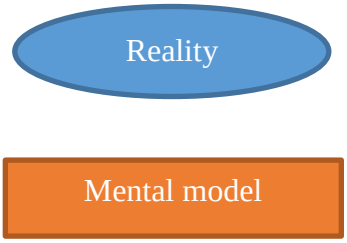
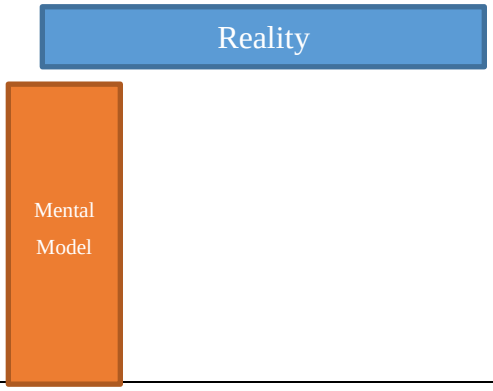
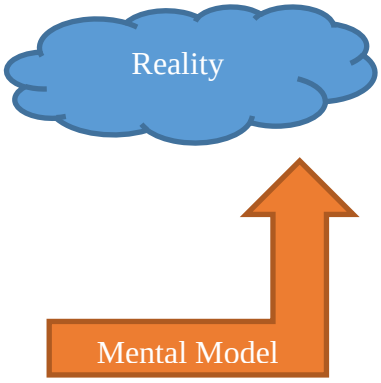
3.3.3 Perception of reality

There is a close link between Holistic Thinking discussed above with perception of reality. According to (Sterman 2000a) our mental models act as filters, influencing the choice of the system of interest. The implication of this idea is that certain components, or elements of the problem may be omitted because of what we see and what we choose to leave out. Sterman argues that there is nothing called unintended consequences, there are just consequences. He attributes the unintended consequences to the limitations in conceptualisation of the problem and the quality of the mental models. Still on these blind spots, (Armson 2011b) attributes this to 'focusing and framing' of the problem. Furthermore, he talks of the lighting, and argues that lighting reveals or conceals the visual features. The significance of his lighting idea is that illuminating certain areas or seeing reality in one colour results in a form of reductionism, which results in obscuring or distorting critical issues.

While perception is critical in shaping the quality of our mental models, it is not the only challenge. Another problem is how we structure our mental models in light of the given reality. Systems thinkers argue that the assumptions underpinning the mental models must be sufficiently congruent given the reality.

Figure 3.3 shows a representation of the disparity that may exist between reality and how mental models are structured. Figure 3.3 shows us that there is need to think about both the problem and structuring the mental model that will be used for intervening into the problem context.

Figure 3.3 Comparison of reality with mental models

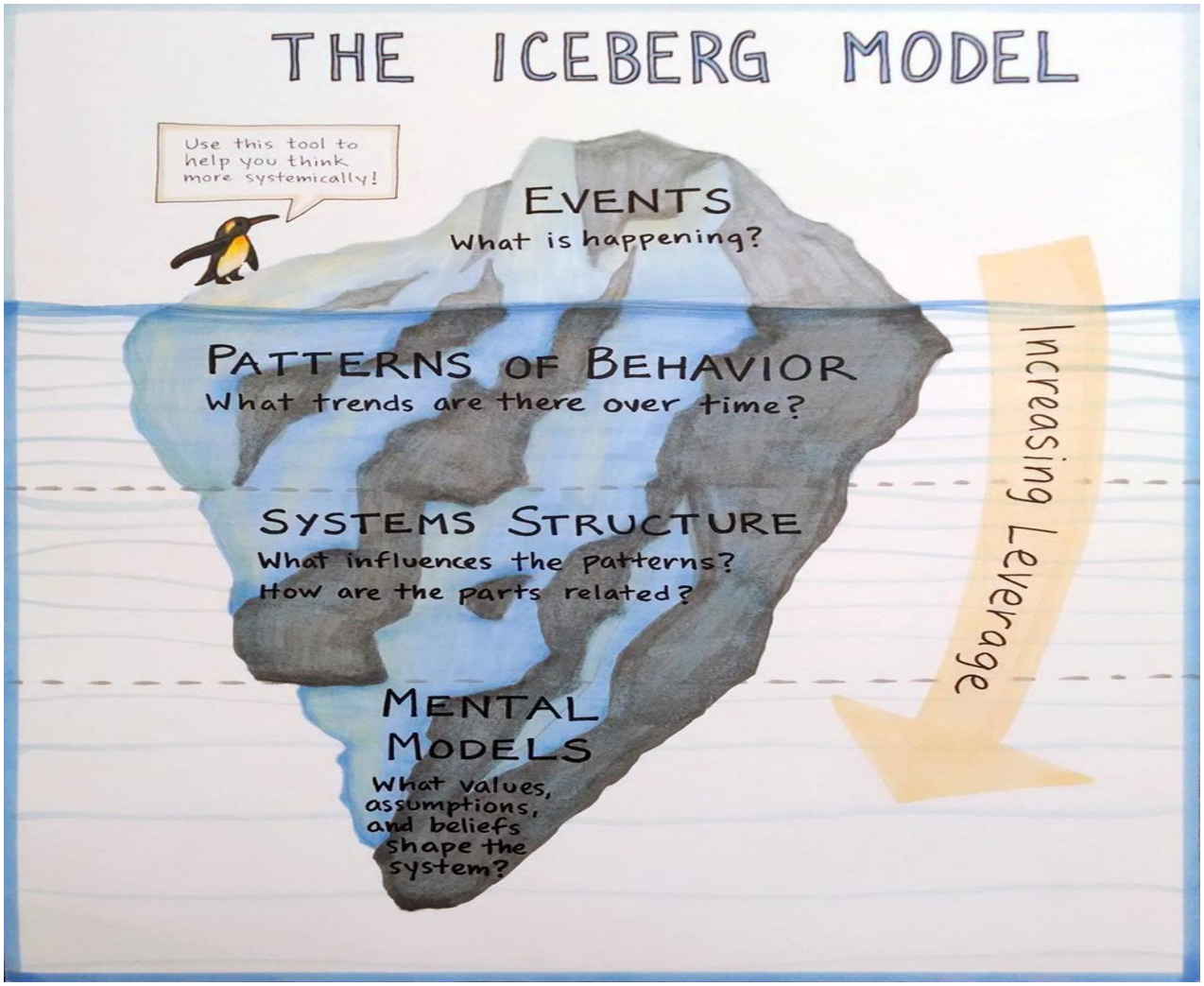
Types of misfit between mental models and reality	Diagrammatic representation
Square holes/rectangular mental models into circles	
Broad and shallow problems against deep and narrow mental model	
Unstructured problematic reality against rigid structured thinking.	

Source: Author

3.3.4 Restructuring mental models, assumptions, underlying beliefs and values

(Sterman 2000a) argues that through ST, mental models are restructured. ST provides a language for a paradigm shift. As discussed in the previous section, problems may be complex, broad, long-term, and dynamic. One such tool is the Iceberg model as represented by Figure 3.4. From this figure, it is clear that behaviour of that system is not apparent at face value. As cited in the introduction of this section, ST offers instrumentation and instrumental techniques for application of the laws of the paradigm. One such tools of analysing the elements is the Iceberg model as exhibited in Figure 3.4.

Figure 3.4: Iceberg Mode



Source: Adapted from www.images.com

Figure 3.4 is critical in that it links the observable reality to its underlying factors. What is clear from this diagram is that events are underpinned by patterns, and patterns are a function of the system structure, which is in turn are driven by the mental models. It shows that leveraging change is embedded in deeper levels. The notion of leverage points is further explored in section 3.3.6 below. From this standpoint, there is need to explore the current challenges in education to the deepest levels of the underlying factors as well as avoiding the 'crisis of perception' or attribution error. Crisis of perception is defined by Sterman as the failure to recognise the interrelations between variables (Sterman 2006). Such narrowness in understanding reality will in turn create more problems in the future.

3.3.5 Understanding connections, system structures and behaviour

Central to systems inquiry is the idea of a 'system'. This word has been loosely applied in common language, yet in the ST paradigm it has significant connotations and meaning. ST practitioners view a system as a web of relationships among elements (Sterman 2001; Jackson 2003). Adding to this view, Amissah, Gannon and Monat (2020) defined the word system as any group of interacting, interrelated, or interdependent parts that form a complex and unified whole that has a specific purpose.

Jackson (2003: 3) defines a system as "a complex whole the functioning of which depends on its parts and the interactions between those parts." This definition is significant in two ways. First, it is important to realise the importance of a system of interest (SOI) in the context of its related systems, especially how these systems are interdependent, yet self-organising. To shed light, Davis and Sumara (2006) classified these related systems into:

1. Microsystems - The system closest to the system of interest;
2. Mesosystem - Relationships among the systems in an environment.
3. Ecosystem - A relationship between two systems that has an indirect effect on a third system.
4. Macro system - A larger system that influences clients, such as policies, administration of entitlement programs, and culture.
5. Chronosystem - A system composed of significant life events that can affect adaptation.

A closer look at this taxonomy shows that any chosen system of interest shares with, and communicates with the elements of the system in which it is nested. This is important in that a deeper understanding of these interactions will inform decision making. Second, a realisation that an evolution in one system has a ripple effect and symbiotic effect with its related elements. According to Sterman (2000a), order emerges from the interactions between agents in the system and is not imposed from outside of the system. This indicates that there is a level of an inherent control, but the control is an emergent property that is not imposed on the system.

3.3.6 Understanding problems and intervening in them

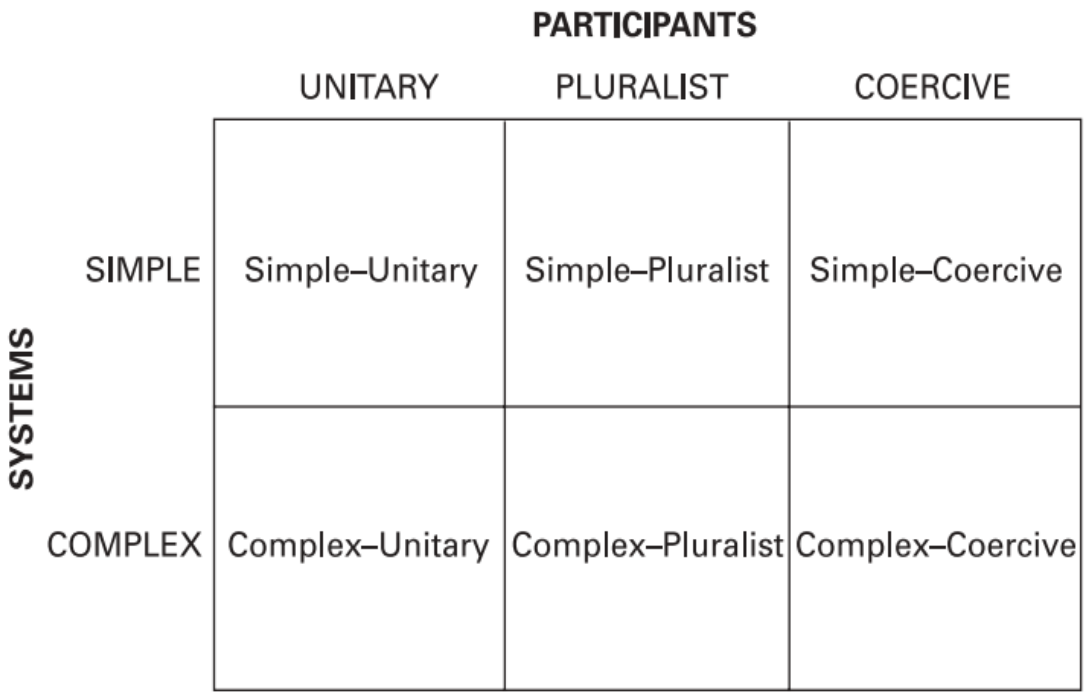
Another point that was highlighted in the referred studies is that ST provides a rich foundation for understanding and handling diversity in complex problems (Jackson 2003; Reynolds and Holwell 2010). Systems thinkers draw much from the dated work of Simon (1973) that problems are ill-defined, thus referred to as problematic

situations, ‘messy’, and at times as ‘wicked problem situations.’ According to Reynolds and Holwell (2010: 4-5), messes are characterised by:

1. More serious implications;
2. More players are involved;
3. The problems are interlocking and may appear in different semblances;
4. They often have longer time-scales;
5. There is high levels of uncertainty;
6. A mess is hard to pin down and lastly there is a possibility of multiple trajectories in outcomes.

Due to this uncertainty, various instruments to articulate the problem have been suggested that help in mapping problem situations. An example of such is Figure 3.5.

Figure 3.5: Mapping problem situations



Source: (Jackson 2003: 18)

According to Figure 3.5, Systems are either complex or simple. Also, participants in the problematic situation range from unitary to coercive. This model provides a structured way in the thinking process. Jackson (2003) argues that such thinking is critical when intervening in problem situations. The key idea is that one needs to

identify and express the pressing issues that need attention (Jackson 2003: 186). This provides the researcher with a deeper understanding of the problem situation. An important point raised by Sterman (2000a) was that problems in a complex scenario are hard to pin down with a single approach due to the uncertainty in the nature, scope, timing and context of the problematic situation. Besides, solutions to "messes" take multiple possible trajectories. Not only are outcomes, and aspects taken deemed to be beyond anyone's direct control, but they are also non-linear and changing between perspectives and consequential actions (Reynolds and Holwell 2010). Therefore, a rich representation of the problem is required.

3.3.7 The Human Factor and the related Dynamics

Systems Thinking is one of the best ways of dealing with the complexities of integrating humans in systems. It is a frame of mind that:

1. Recognises that humans are dynamic. According to Peter (1990), people are not helpless reactors but are rather active participants in shaping their reality. They evolve, and mutually affect the context in which they are embedded. By evolution I mean that their actions and behaviours are altered by experiences. Such experiences have learning curve effects that reshape future behaviour and action.
2. Humans act from purposeful activity. They are driven by personal strategic intents, and as self organising individuals, they will try as much as possible to achieve these intended objectives.
3. Humans bring different worldviews, ideas, expertise and backgrounds.
4. Human beings are not machines, they attach meanings and values to events and circumstance. Thus in shaping reality, participants carry a particular lens normally influenced by their background, experience, assumptions, values, norms, and beliefs.

Besides the active engagement of multiple participants to a problematic situation, it becomes critical to know that humans act with purpose, they are goal seeking, they are self-organising and have the inert ability to adapt. With multiple participants comes diversity of world views and complexity.

Closely linked to this idea is the notion of symbolic Interactionism (SI). SI is derived from the works of George Herbert Mead (1864-1920). According to Blumer (2004), the scope of SI is narrowed to the meanings nuanced from the interactions between individuals. The thought process is critical in SI. Three critical principles that underpin the thought process are meaning, language and thought. According to Haralambos and Holborn (2008), meaning refers to the construction of reality, and these constructions are dynamic, can be developed, modified and changed. These changes are a function of the players, context, and language, furthermore, by how the players interpret the meanings and how they accord different symbols to such meaning. According to Quist-Adade

(2019), a symbol has been defined as any act or object that has a representative meaning. Thus, perceptions of interactions, reality, and context are structured by the individuals' interpretations and internalisations.

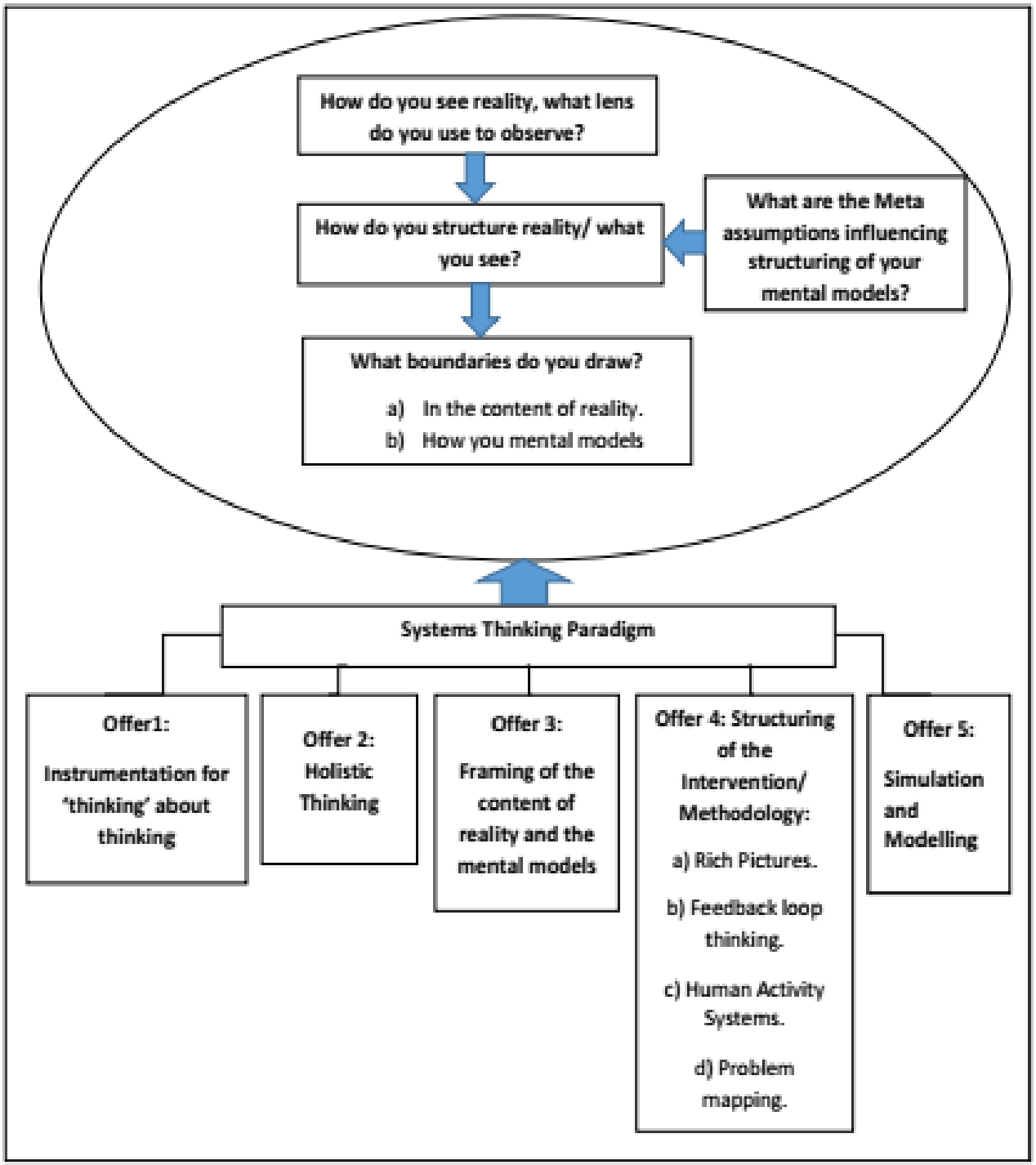
The implications of the theory of SI is that society is a product of the interactions between its people, whose communication takes place through the use of symbols. The link of SI and ST is that meanings attributed in any given situation are diverse, and subjective to the contexts of the situation. Given the diversity of worldviews, contexts, and attribution of meaning, perception of reality from a Systems Thinking lens takes a dynamic trajectory.

From the foregoing, ST therefore underscores the role and nature of information in complex and dynamic systems, recognising that systems involving humans are open systems and can evolve to increasing complex forms through self-reflection, learning, consciousness, and emergence of mind. Thus, in intervening in situations involving humans, systems practitioners are required to include all participants to a problematic situation; creating goal ownership in decisions from all stakeholders; embracing pluralism; dealing with power dynamics, and culture dimensions in relation to change. In carrying out any interventions, systems practitioners will carry the notion that change is underpinned by the dynamics that are non-linear and complex. This calls for an appreciation of the interplay between the changing environment, the competing interests, and the self-organising aspects within the system of interest.

3.3.8 Systems Thinking as a vehicle for learning, innovation and creativity

So far, this thesis argued that the way we see the world is influenced by our world view. This world view helps in filtering what included or excluded in any area of Interest.

Figure 3.6 Summary of Systems Thinking Offerings



Source: Author

3.3.9 Conceptualising the Challenges in the Zimbabwean Education system using the ST lens

As discussed in Chapter Two, various studies have looked at the problems of the education system with different lens. In this study, I use the Systems Thinking and summarise the embedded challenges in Table 3.2.

Table 3.2: Conceptualising the challenges in Zimbabwe

Characteristics of the system in place	
World view of learning	1. Reality is concrete and predictable. 2. Reductionist thinking and linear causality.
Learning approaches	1. Theory laden 2. Content-based. 3. Learning as acquisition of knowledge. 4. A focus on 'know that' and learning 'about.' 5. Single subject, and detached learning. 6. Passive pedagogy. 7. Little emphasis on the 21st century technical skills. 8. Much emphasis on summative assessment. Soft skills, and entrepreneurial skills not assessed. 9. Very little collaborative and team learning. Individual genius and heroes still characterise the merit system. 10. No deliberate attempt both in policy and pedagogy to focus on positive self-image construction and assertiveness.
Learning outcomes and development thrust	1. Competence based. 2. Drawing much from the Historical challenges, with a thrust of correcting the historical imbalances. 3. Preservation of Heritage, local values, and virtues. 4. Inward looking, focusing on Zimbabwean specific learner.

Source: Author

This section covered the ST theoretical framework. It demonstrated that ST was a useful tool in enabling learners to have a new pair of lens or world view of looking at world, the future and reality. From this narrative it becomes clear that Systems Thinking paradigm is a useful learning tool in helping learners have a deeper understanding of the underlying properties of systems. Learners need to embrace emergent thinking to cope with complexity and unknowable futures. This section also demonstrated that ST is a vehicle in knowing this unknowable future. In addition, the attributes of holistic thinking, recognition of the deeper system interactions and the dynamics of change. I argue that these attributes are critical intelligences for adaptive thinking. Furthermore, in dealing with

change, learners need to recognise that everything is part of a system. In addition, tiny, trivial actions can have huge, irreversible impacts.

Given this theoretical framework, I go to the literature used in developing our understanding of how education systems have evolved, why they function in the way they do and how I intend to leverage in change.

3.4 Future-Oriented Education (FOE) with a specific focus on Entrepreneurial Leadership

As discussed in section 3.2, the learner, and the society in general are faced with a dynamic environment which in turn imposes new challenges. Conceptualisation of work, and working processes are changing, new careers are emerging with some becoming obsolete. As Pöllänen and Urdziņa-Deruma (2017) argues, new cultures are being formulated and thus there is a need to rethink education for it to be future oriented. Already, the mismatch between skills demanded and those provided from learning institutions is becoming a global concern (Shevchuk, Strebkov and Davis 2019). If this skills gap is not addressed, economies are likely to suffer twice - firstly, loss in the opportunity cost of resources channeled into education whose outcomes will be inappropriate, and secondly, in the cost of unemployment. What this means is that there is need for collaboration between industry and education to 'predict' the future skills demand. Apart from the challenges mentioned above, globally, the world is grappling with depleting resources; climate change; water energy and food crisis; sustainable economic development; racism and inequality.

3.4.1 Key Elements of Future oriented education

According to (Statistics 2006; Tang, Vezzani and Eriksson 2020), the 21st Century summons cognitive competencies such as: creativity and critical thinking; oral and written communication skills; collaboration and cooperation; conflict management; decision-making; problem-solving and planning; and practical citizenship. Studies on the fourth industrial revolution indicate that the fusion of the physical, digital and biological spheres will demand critical thinking, complex problem solving, creativity and innovation, and emotional intelligence. This implies that future oriented approaches have to shift from exam coaching to project-based learning and contextualised problem solving. Unlike the traditional approaches to learning, adopting such an approach entails motivating the learners to find their own solutions than converging to a single correct answer mentality. Closely linked to problem solving is the need to understand the society, its challenges, and the economies in which these societies are embedded. To that end, FOE, should provide such skills that will equip learners for drawing these boundaries and identifying the critical factors that will impact their solutions.

Another key aspect of FOE is trans-disciplinary approach to learning. Trans-disciplinary is defined as a learning approach where knowledge in one field is actively used in the understanding of another discipline. Unlike multi-discipline where one has to have more than one skill, transdisciplinary learning foregrounds linking or connecting theories and concepts between disciplines. Transdisciplinary learning implies that learners must be able to tackle issues from a variety of theoretical and practical grounding. This implies that new knowledge, skills, and meaning emerge in the process.

This significantly calls for:

1. Recognition that pedagogy has to move from single-subject specialisation approach.
2. Reconsideration of the role of the teacher and their teaching skills.
3. Rethinking of the learners exit profiles.
4. Reconstruction of the teaching approaches and assessment.

These proposals are given in the context that learners must be able to combine ideas from their different disciplines. New learning emerges as they approach issues from these different viewpoints. This builds a culture of being inclusive, holistic, and innovative.

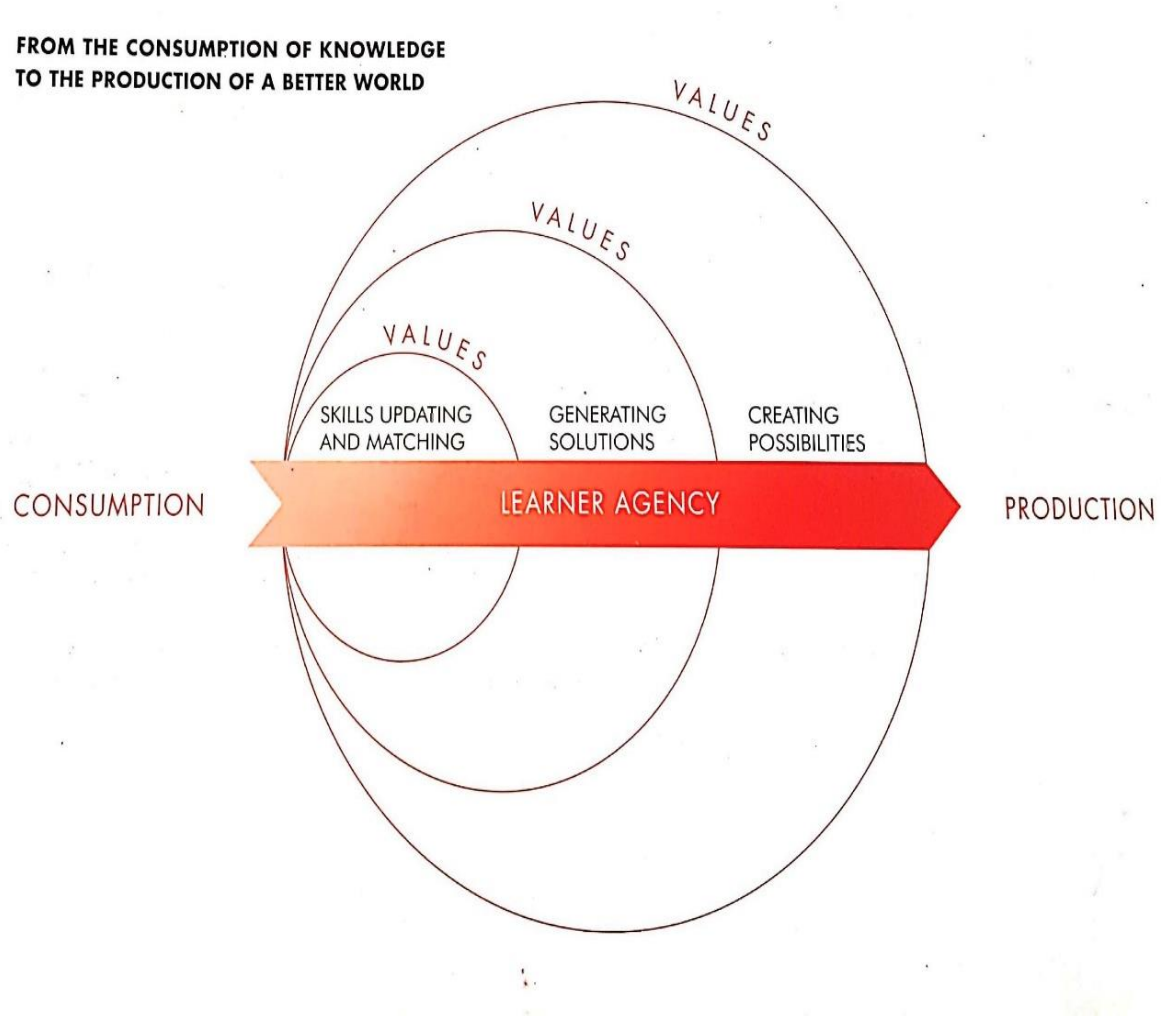
Another important aspect that is demanded is logical thinking. According to Copi, Cohen and Rodych (2018), logic entails being able to use and join facts to a reasonable conclusion. While, logic is taught at tertiary education, FOE, requires learners to be grounded from early childhood development in logical reasoning. With logical skills, learners will be able to distinguish between relevant and irrelevant information. While it may be argued that logic is taught in mathematics, however, as evidence suggest its practical relevance seems to be overlooked.

One of the skills emphasised in FOE, is collaboration skills (Calado and Salles 2015; Khoiri *et al*. 2021). Learners are required to work in teams, and move from ‘solo’, ‘hero’ or ‘genius’ mentality and achievement to collaborative attainments. This means that they must have good communication skills, emotional intelligence and good team etiquette. This must be grounded on a good self-concept or assertiveness. In addition, they must be able to embrace multiple worldviews, and be able to respect and work with diversity. In essence, learners will need to embrace diverse interpretations and competing solutions. This obviously, is antithetical to the current practices in education characterised by a single correct answer perspective.

One of the facets of FOE is handling complexity. As previously explained in section 3.3, the world is VUCA. This calls for educators to be geared for the dynamics of complexity and emergent learning outcomes. As posited

by Khoiri *et al.* (2021), learners must be taught how to handle ill-defined problems, uncertain futures, ambiguities, and dynamic changes. This illustrates the need for learners to be prepared to be active creators of their future than being observers or victims of change. Perhaps, the comprehensive work of Hannon, Gillinson and Shanks (2013), becomes handy in this case. They propose a model which helps learners and educators to move from knowledge consumption to knowledge creation as shown in Figure 3.7.

Figure 3.7: Hannon's Model of moving from Knowledge Consumption to Knowledge Creation



Source: Hannon, Gillinson and Shanks (2013: 136)

The contributions of Hannon, Gillinson and Shanks (2013: 136-137) are significant in three ways to FOE. First, they suggest the role of learner agency. They define learner agency as the ability to take control of their lives, to see, understand, and believe in their self-competencies and abilities. This is worth noting as confidence building is rarely given prominence in schools. This view suggests a pedagogy which is underpinned by assertiveness

where learners are taught to be confident and responsible individuals. In addition, being accountable for both of their learning, and their future. Second, the proposition that learners must be able to match and update their skills, which points to their ability to navigate difficult contexts, and be flexible by adapting to the changing demands. And lastly, their model shows a learning continuum which moves from skills acquisition to creating possibilities. This idea is congruent with the principle of lifelong learning agenda of the 21 century learning. More on the elements of FOE are clearly outlined by Lackéus *et al.* (2016).

From the foregoing, it becomes clear that that rethinking and revising education from Early Child Development (ECD) through university, to embrace a clear focus on the development of the knowledge, skills, perspectives and values that will be beneficial to current and future societies is not only important but necessary. In the next, section learning approaches for Future oriented education are discussed.

3.4.2 Future oriented learning theories

In this section, I will review the learning theories underlying future oriented education. Firstly, a brief summary of the learning theories will be discussed; secondly, I will review transformative learning theories; thirdly, Kolb's experiential learning model; and finally an emphasis of collaborative learning.

There is vast literature dealing with learning, and teaching theories. Common theories include: Behaviourism approaches, Cognitive, Language and Thought theories and mixed approaches. Learning theories (LT) refer to ways in which learners learn, more specifically outlining 'how' individuals acquire, organise and deploy skills and knowledge. There is a common notion that LT underpins educational philosophy, most importantly, the beliefs, and values, thus providing insights into how and why people learn. It is from the LT that educators craft their teaching approaches in order to facilitate learning. Thus, there is a mutual correlation between teaching theories and LT. For purposes of this study, I draw from the vast literature of LT, those theories that are pertinent to, and that inform the teaching and learning of EL. Interest in LT stems from the understanding that teaching approaches impact originality, thinking, creativity, and innovation in learners. Literature classifies LT into a range of domains, but the most common are as summarised in Table 3.3.

Table 3.3: Classes of Learning Theories

Domain	**Major Theories**	
Behaviourism	Pavlovian Theory	Pavlov (1927)
	Operant Conditioning	(Staddon and Cerutti 2003)
Cognitive	Gestalt Theory	Lewin, 1935; Kofka 1935, Wertheimer 1945
	Language and Thought Theories	(Piaget 1926; So 1964), and (Vygotskiĭ 2012)
Mixed Approaches	Behaviour Modelling/Social Learning	(Bandura 1977)
	Task Analysis	(Gagne and Briggs 1974)
	Neuro-Linguistic Programming (NLP)	(Bandler and Grinder 1979)
	Cybernetic Analogies	
	Experiential Learning: • Kolb Learning Model • Transformative Learning • Action Learning • Living Theory	Kolb (1984), Honey and Mumford (1986), Whitehead

Source: Author

This classification implies that learning orientations are different. A closer observation of Table 3.3 reveals the following:

1. There is no one theory that is absolutely perfect - each theory has its shortcomings that may be complemented by strengths in other theories. Where one theory fails to provide sufficient information to a phenomenon, this is complemented by views from its critics.
2. The objectives of learning should dictate the instructional strategies. There must be a bias towards a more constructivist in learning approaches rather than being teacher-oriented. This leads to the question of whether such differentiation is applied in the teaching approaches. Are the formative intentions embedded in the models being realised of creating 'holistic' learners? Or the 'straight jacketed' approach is being applied.

3. The world is dynamic, and therefore there is need to "accommodate" complexity and multiple world views.
4. Teachers are not immune to weaknesses, and they must be re-skilled to cope with the shifting demands of learning.

Based on these observations, the following sections review firstly the behavioural theories, then the constructivist theories, and lastly zero in on the experiential model. A review of literature indicated that behaviourists viewed knowledge as a repertoire of behavioural responses to environmental stimuli, what has been known as the Stimuli-Response theories. This implies that learning is perceived to be passive absorption of predefined bodies of knowledge through repetition and positive reinforcement. However, the works of by Piaget (1976), Vygotsky (1986), Kolb (1984) on Experiential learning and later by Mezirow and Taylor (2009), criticised the behavioural theorists citing the distorted view that motivation was an extrinsic factor. Furthermore, they argued against the linear approach to the thinking of taking teachers as transmitters of information and students as absorbers and respondents. This theory was relevant in this study in the following ways – It demonstrated that stimuli creates response, implying that deliberate efforts aimed at improving the bouquet of EL skills is likely to yield some results. It also provides a solid argument that learning affects cultures. It thus becomes a good tool for unlearning undesired behaviours, and the relearning process.

Cognitive constructivism is another type of LT. The cognitive constructivist holds the view that knowledge systems of cognitive structures are actively constructed by learners based on the pre-existing cognitive structures. Learning is by active discovery (McConnell *et al.* 2017), and as argued by Suryawati and Osman (2017) learners interpret experiences and information on the basis of their existing cognitive structures. Cognitive structures include among others: the extant knowledge, background, culture, stage of cognitive development, and past experiences. Proponents of this view, unlike the behaviourist, posit that learners' motivation is intrinsic. They are accountable for their learning processes. The implications for teaching are that the "facilitator" must provide a conducive environment which promotes discovery, assimilation and accommodation (Suryawati and Osman 2017; Husni 2020; Nuñez Enriquez and Oliver 2021). This theory informed this thesis by pointing out that curriculum design is very important. To explain, it demonstrates that competencies omitted at the design phases are most likely to create a weak foundation and scaffolding for future learning process. There is therefore need to stimulate cognitive structures at this design phase which reverses such mentalities like 'worker', and 'dormant' learner mentality which were highlighted in Chapter Two.

Having highlighted the different categories of LT, I will now explore transformative learning in the following section.

3.4.3 Transformative Learning (TL) and Effective Implementation

According to Mezirow and Taylor (2009), TL is learning that transforms problematic frames of reference to make them more inclusive, discriminating, reflective, open, and emotionally able to change. Central to this definition, is change in world views or lens by which one sees and interprets reality. Change in world views is not easy, given that they may be grounded in long held beliefs, experiences and value systems. The implications of Mezirow, in learning are that learners must be incited for this transition. They need an open mind, to be more critical thinkers, and be able to challenge their ideas, assumptions and belief systems. From this view point, it becomes clear that TL will help in reframing learners' paradigms, and expanding their consciousness.

The idea of emancipation through learning is not new. An evaluation by Hoggan (2015) showed that TL could be used as an emancipatory heuristic. Hoggan argues that through active engagement, and dialogue, learners construct new meaning from the learning experiences. Learners thus become active participants in shaping their future. Consequently, they move from being passive recipients of the prevailing social structures and practices.

One important aspect of TL is the need for disruptive experiences. Patterson *et al.* (2015) argues that this stimulates and acts as a catalyst for learning and teaching. The implications of this idea is that teachers must create such needed 'disruption' in their teaching. That is, learning should be task-oriented and interactive. This is important in that it shows the importance of lesson design. Lessons must be designed in a manner which triggers change. In corroboration, Husni (2020) argues that the instructional approaches (include implications on aspects of learning e.g. classroom management, facilities, laboratory experiments etc.) should trigger an attitude of inquiry in learners to question, contest, and transform the knowledge being taught.

From the foregoing, TL provides insights, and a theoretical and empirical basis for profound learning. It is a useful heuristic tool for social and individual change. The question that remains is whether Transformative learning is being implemented in the current instructional methods. Another concept that falls within the same category is Experiential Learning, which will be discussed in the following section.

3.4.4 Experiential Learning and Leadership

This section discusses Kolb's learning model as it informs future oriented education and promotion of enterprise learning. Kolb's model falls under experiential learning theories. It was developed by Kolb (1984) and was further modified by Honey and Mumford (1986). The learning cycle basically involves four stages, namely:

concrete learning, reflective observation, abstract conceptualisation and active experimentation. Although effective learning could be realised when the learner progresses through the cycle, learners may enter the cycle at any stage of the cycle. At the core of this model is the idea of quality learning which is grounded on constructivism. In constructivism, learners create knowledge through experimentation and reflection.

The work of Kolb is significant in several ways. Firstly, learning is conceived as a process rather than an outcome. The key implication drawn from this is that equal weighting is placed on each phase of the learning continuum. Secondly, learning is a continuous process grounded in experience. Thirdly, the learning process requires the resolution of conflicts between dialectically opposed modes of adaptation to the world. Fourthly, learning is a holistic process of adaptation to the world. Fifthly, the interaction of the learner with the environment is part of the learning process and lastly, learning is perceived as the process of knowledge creation.

Critics of Kolb resonate with systems thinking approaches that learning does not follow reductionist fragmented cycles. Rather, learning is complex, and the learning process is dynamic, more iterative and non-linear. Apart from the cited critics, the model has been widely applied and remains relevant if applied as one of the many learning tools.

3.4.5 Collaboration learning

One tool that promotes future oriented education is the quality and network of learning communities. Collaborative learning is an educational approach to teaching and learning that involves groups of students working together to solve a problem. CL is premised on the effective group dynamics which include positive interdependencies, effective interactions among group members, individual accountability and good interpersonal skills. The benefits derived from CL approaches are significant. First, learners are actively engaged in the learning process. They can draw from both personal and collective experiences in framing new information. Second, instead of passive assimilation of knowledge, learners can actively engage his/her peers, in processing and synthesising information instead of simply memorising and regurgitation. Third, learners benefit from exposure to diverse viewpoints and in addition they learn to create and defend their conceptual frameworks. The downstream benefits of this point as argued by Supena, Darmuki and Hariyadi (2021) is that they will learn to reflect on their own ideas and as they compare their weakness with proposals from other learners new nuances will emerge. Lastly, this approach is close to real life experiences where people work in teams to solve problems.

Hannon, Gillinson and Shanks (2013) also found that CL links theory with practice. This is vital because it simulates and affords a platform conducive for transformative pedagogies which are not only knowledge based but also skills based. Hietanen (2015) posits that CL 'stretches' learners to think and in the process they 'discover' their inert abilities, and in turn will learn to propagate these intrinsic aptitudes.

3.4.6 Discussion on Learning Styles

Learners have different learning orientations, and as argued by Brock (2011), learning should be designed so as to embrace the diversity of learners. From the foregoing, various theories present different taxonomies of learners. The multiple learning orientations together with the diverse objectives of students imply that the teachers should handle this complexity in their teaching approaches. Since a differentiated approach to learning has evidence of successful outcomes, there is need to test whether there is effective handling of students' diversity in learning approaches and whether there can be an improvement in the instructional approaches to trigger creativity, improved self-awareness, leadership skills and better exploitation of learning opportunities. As argued in section 3.1, I explore how the ST theories can better inform the teaching and learning of sciences to come up with an EL driven agenda. I again test how the soft approaches of mentorship, coaching, and role modelling can be of use.

3.5 Entrepreneurial Leadership Explained as an Ideal for self-sufficiency than Dependence

In developing my argument, I propose that entrepreneurial leadership is an essential leverage point in education change. By leadership I mean influence, working through others, and 'drawing out' or realising the best from self and others. A leader is being able to leverage one's knowledge in interpreting their context, for adaption and generation of possibilities. In taking this view, my interest is in taking entrepreneurial leadership as a grounding for self-sufficiency and socio-economic emancipation of the majority of young people in Zimbabwe. Justification 1. Section 3.3, Unknowable futures, 'vucaness' of the context, systemic blind spots. Section 3.4, Future oriented education is enterprising, transformative, and experiential. From the Systems Thinking framework, the idea of a lens that is holistic, and systemic has been proffered. The gaps presented by failures in the education systems has been thus identified and discussed. The question which remains is the idea of a vehicle that will synthesis these two ideas into one pragmatic model. In this section, I will discuss EL in the context of unknowable futures, Personal leadership, global thinking and integration.

3.5.1 Entrepreneurial Leadership and the future

The idea of Entrepreneurial Leadership (EL) can be traced to McGrath and MacMillan (2000), who fused two concepts - entrepreneurship and leadership. A definition which places EL and the future in the context of this thesis was given by Gupta, MacMillan and Surie (2004: 242) who defined Entrepreneurial Leadership "as a form of leadership behaviour distinct from other types of leadership behaviours, and is required for highly turbulent, challenging and competitive environments." Entrepreneurial Leaders are therefore expected to operate in a world that is highly unpredictable competitive dynamic and where change is not an exception but the norm. Not only has the world become increasingly unpredictable, but as argued in section 3.3, it has become clear that it consists of integrated and interrelated systems. The implications are that there has arisen a new competitive landscape in which traditional strategies have become questionable and impertinent.

Analysis by Hossain *et al.* (2020) indicates that the genesis of Systems Thinking was that traditional planning premised on linear thinking, accurate predictions had failed. This argument seems to be historical as cited by Cavaleri and Sterman (1997), that markets were characterised by an increase in uncertainty, competition, and volatility. This has culminated into uncertainty in demands. As a result, both companies and individuals are 'pushed' to be adaptive, and evolving. By evolution I mean a conscious and deliberate intention to transform and rebrand, repositioning, redefine, and recalibrate service offerings. The same applies to standards and quality. The question which therefore emerges is whether business survival is anchored on adaptive and or proactive transformation? This question speaks to the caliber of people required for this new landscape. Senge (2006) speaks of the concept learning organisations and individuals in the context of adaptation. It becomes apparent, that generative thinking is required. Such thinking that influences the future and creates new profit streams, products and models.

An interesting observation by Onyemah and Pesquera (2015) indicates that creative logic is ideal for environments characterised by: high uncertainty, unpredictability, limited future data, ill-defined and ill-structured problems. Their idea of creation logic is premised on experimentation and design thinking in order to generate new data, solutions and knowledge. This poses a big question to educators where this creative thinking process is expected to be incubated. A recent publication by Patvardhan and Ramachandran (2020) maintains that this sense of creativity opens the eyes to an evolution of new possibilities and reshaping of opportunities for emergent and unique outcomes. Entrepreneurial leadership therefore kicks in, and this resonates with views by Ansari *et al.* (2014) that entrepreneurial leaders are 'creators' of value, solutions, and new possibilities.

3.5.2 Entrepreneurial Leadership and Personal Leadership

An interesting point in adaptation is the idea of conscious self-awareness and contextual proactiveness. Greenberg, McKone-Sweet and Wilson (2011), define Entrepreneurial leaders as individuals who have a

conscious understanding of self. In so doing, they link the adaptive skills to a realisation and utilisation of one's competencies. Such intelligences are useful in making sense of the contexts in which they work. Creativity, opportunity optimisation and value creation cannot be undermined. Some key concepts are innovation, risk–taking, creativity, and prudence overtones. Recent studies by González-López, Pérez-López and Rodríguez-Ariza (2020) also proved that these key personal entrepreneurial competencies of commitment, planning and organisation have a strong correlation with entrepreneurial success.

In terms of success, one cannot discover the exogenous world without a thorough familiarisation of themselves and their personal capabilities. In a study comparing two groups of professionals in innovative companies, Santandreu-Mascarell, Garzon and Knorr (2013), shed more light on these endogenous entrepreneurial competencies. They summarised personal entrepreneurial competencies into ten clusters. Two of these clusters speak to self-discovery and self-mastery; independence and self-confidence; and demand for efficiency and quality. In addition, they underscore three attributes as anchoring independence and self-confidence. First, one must seek autonomy from the rules and control of others. Second, the person must be directed by his own judgement in both adverse conditions or even in the event of opposition. Third, the person must express confidence in personal abilities and completion of tasks. It appears that entrepreneurial leaders have a strong personal locus of control, coupled with a strong resolve in order to make it as an entrepreneurial leader.

In their second cluster, Santandreu-Mascarell, Garzon and Knorr (2013), highlighted that the entrepreneur must have a demand for efficiency and quality. The implications of this demand is that one must find cheaper, better, and faster ways of doing things. These attributes resonate with the three E's of efficiency, effectiveness, and economy that are emphasised in the Soft Systems Methodology, which is discussed fully in section 3.2. In grouping efficiency with quality, they show that quality should not be compromised, or sacrificed because of the efficiency demand. An entrepreneur therefore should meet or exceed the demands of both quality and excellence.

The idea of self-discovery and self-mastery is closely linked to the concept of self-efficacy. Bandura (2012) defines self-efficacy as the individual's ability, willingness, and confidence capacity to successfully perform tasks in any given situation and produce good results. In order to be efficient, one needs a strong personal value system anchored on self-mastery and efficacy. In a study of 722 Malasyian university students, Pihie and Bagheri (2013) proved that a students' self-efficacy highly affected students' entrepreneurial intentions both directly and indirectly. The key point in their findings is that an entrepreneurial leaders must have an internal locus of control. It is from this inherent character that one becomes both responsible and accountable for their actions and success.

I concur with their conclusion that people with high self-efficacy are highly motivated; will set goals; and will be highly responsible for their success.

One point that is closely linked to the self-concept is entrepreneurial thinking or the entrepreneurial mindset. The study of entrepreneurial thinking is critical in that it outlines the 'soft' aspects that drive the entrepreneurial actions. Since one of the goals of learning is to influence thinking, a conceptualisation of this thought process is worth exploring. Mohamad *et al.* (2019) define the entrepreneurial mindset as the knowledge structures that people use to make decisions or judgements involving opportunity optimisation, creating influence, venture creation, innovation and growth. They argue that entrepreneurial thinking is a critical intervention, and that entrepreneurial education is the vehicle to that end. In related studies, Ansari *et al.* (2014) outlined some of the components of entrepreneurial thinking: critical thinking and problem solving skills; quantitative reasoning; and design thinking.

Predictive logic applies in situations where future goals and circumstances reflect the past. According to Onyemah and Pesquera (2015), prediction logic is predicated on five assumptions. First, the goals can be predetermined and future information is known and available. Second, there is sufficient information required for analysis. Third, decision making is guided by given frameworks. Fourth, constraints and permutations of solutions can be identified. Lastly, risk is easily identifiable, and can either be eliminated or mitigated. It is apparent that prediction logic works well in saturated and stable markets. Furthermore, in short-term planning where the level of turbulence is either very low or next to nothing.

Situations where prediction logic is applicable truly form part of the decision process though they apply mostly in 'ideal' cases which are very far from reality. Although predictive logic may not be ideal for complex and messy situations, none the less, it appears to be a critical tool of looking at the future. Another point that is important in EL construct is its holistic development. According to González and Guillén (2002), such development is multidimensional consisting of the technical, psycho-emotive and the ethical dimensions. Drawing from this idea Figure 3.8 illustrates this link.

Figure 3.8: Dimensions of Entrepreneurial Leadership

Source: Author

Figure 3.8 is a representation of the critical drivers of EL. Considering the psycho-emotive attributes of Figure 3.8, (Fernald Jr, Solomon and Tarabishy 2005) argues that a leader should have enthusiasm, the motivation for achievement, ambition, energy, tenacity, and initiative (Fernald Jr, Solomon and Tarabishy 2005). This is significant in that the leaders must have intrinsic motivation and emotional intelligence. Turning to the ethical issues, evidence suggests that honesty, integrity, and sustainable use of resources are key attributes of an entrepreneurial leader.

The technical dimensions, the EL construct consists of: pro-activeness, risk-taking propensity, and innovativeness (Van Zyl and Mathur-Helm 2007). Gupta, MacMillan and Surie (2004) also add commitment and creative discovery-driven exploitation of opportunities in the environment. It can be argued that the visible attributes of EL are underpinned by the soft aspects.

In addition, leadership should have motivation, including: honesty and integrity, self-confidence, cognitive ability, and knowledge of the business. However, contemporary critics of the trait theory argue that leadership involves more of influence than the inherent traits in the leader himself (Yukl and Mahsud 2010). Furthermore, the effective leader embraces both the task and socio-emotional/relationship dimensions of leadership (Iles and Preece 2006). Thus, engagement, inclusion, effective communication and management of relations stand out as key attributes that make leadership operational and practical. No leader operates in a vacuum; good leadership is a ‘collective’ interaction of a leader with his/her social and organisational context and people. Different studies have been done showing convergences and differences of entrepreneurship and leadership (Gupta, MacMillan and Surie 2004; Bagheri, Lope Pihie and Krauss 2013). There is a skew towards overlapping qualities between the two fields, with some advocating the use of the two terms interchangeably. On the contrary, entrepreneurship, leadership, and EL remain separate and distinct fields.

Central to EL is the practical application of skills to create value. EL competencies include the specific leadership capabilities necessary for successfully executing the entrepreneurial activities and successfully leading in complex environments (Cogliser and Brigham 2004; Bagheri and Pihie 2011). These are vision, adaptability, persuasiveness, confidence, competitiveness, risk-taking, honesty, perseverance and integrating knowledge across different disciplines.

3.5.3 Entrepreneurial Leadership and adaption

Researchers argue that Entrepreneurial Leaders should have adaptive skills to deal with a highly turbulent and competitive environment (Gupta, MacMillan and Surie 2004; Reynolds and Holwell 2010). This means exhibiting the requisite variety in more complex personalities to perform beyond the demands of the dynamic environment. Complex personalities implies these leaders must be adequately multi-skilled to face different challenges (Ives 2011; Harrison, Leitch and McAdam 2015). Being adaptive entails high tolerance for ambiguity and stress, in addition, having decisive urgency and resilience. It is interesting to note that adaptive skills will enable students to be proactive in transformation and repositioning in uncertain contexts. Continuous innovation, learning and creative use of scarce resources will allow students the ability to absorb uncertainty and be inventive in value-creation. In support, Onyemah and Pesquera (2015) argue that the idea of cognitive ambidexterity corroborates prediction and logic creation.

Gupta, MacMillan and Surie (2004) outlined important aspects of framing the challenge, absorbing uncertainty, path-clearing, building commitment and specifying limits. According to Gupta, innovativeness, risk-taking and pro-activeness have a strong link in framing the challenge. This means that the leader must have a vision, interpret the context cues well, and leverage a strategic positioning that will give him a competitive advantage. In essence, under whatever conditions, the leader must have confidence to navigate uncertainty and to achieve success under such adversity.

3.5.4 Discussion on the role of Entrepreneurial Leadership in Education

So far, the following arguments have been made: firstly, that entrepreneurial competences cannot be confined to skills specific to business, the scope is much broader. Secondly, it has been argued that there is need for learners to have a strong development of their personal leadership skills. As the reader will note, I took the broader aim of entrepreneurial leadership, purposefully evading the aspects of new venture creation as this is not relevant to the study population. In taking this view, I agree with Lackéus and Sävetun (2019), who argues

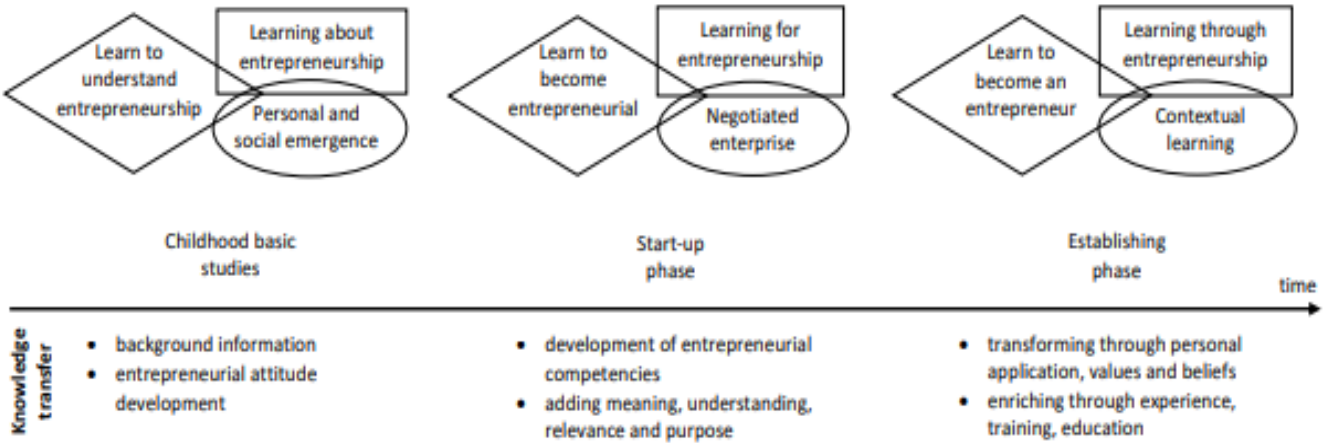
that the focus of enterprise education applies to all walks of life. Moreover, they argue that its aim is to foster creative thinking, generation of ideas, action orientation, and proactiveness.

Furthermore, my emphasis on these softer aspects is also echoed by various authors who argue that the learner must be developed holistically. Such development encompassed: cognitive components (knowledge, skills, and beliefs), affective components (feelings, emotions, attitudes) and conative components (motivational and volitional steering of actions including self-beliefs, achievement and career orientation).

The idea of enterprise education is motivated by the traction it is gaining in other parts of the world. For example Europe has implemented enterprise learning. In a landmark study that looked at challenges and opportunities for entrepreneurship learning in the European Union, Gribben (2006) highlighted the need for recognising entrepreneurship as the new way of life. They position enterprise learning as a core competence; and as a discipline that goes beyond commerce or business start-ups. The study is significant because, not only does it justify enterprise learning, but also, expands the scope of entrepreneurship in learning. It makes it clear that enterprise education underpins all entrepreneurial character traits.

In the study of enterprise education, the contributions of Kirby (2004) were pivotal. He advocated for a world view to entrepreneurship which surpasses venture creation, but also embraces creativity and change. Kirby stressed that the conduit for such change was embedded in a reform in the content and the process of learning. He argued for a transformation in the content to include: communication skills; creativity skills; critical thinking and assessment skills; leadership skills; negotiation skills; problem-solving skills; social networking skills; and time-management skills. Kirby argued for a transition from educating 'about' entrepreneurship, to educating 'for' entrepreneurship. By this he emphasised the need for a practical utility of entrepreneurship as opposed to content-based approach to entrepreneurship. In a recent study, Raudsaar and Kaseorg (2016) developed Kirby's idea further. They developed a model of Entrepreneurial learning which is summarised in Figure 3.9.

Figure 3.9 Raudsaar and Kaseorg's Model of Entrepreneurial learning



Source: Raudsaar and Kaseorg (2016: 221)

The model Figure 3.9 shows the learning continuum from grass roots level until the last phase of establishment. Although this model was produced in the context of higher education, its contribution even to education at primary level are immense. This model makes it clear that educators need to go a step further in providing context-based practical competencies in entrepreneurship. Their idea of learning 'through' entrepreneurship implies that practice enriches the learning process. Although this model provides insights into why the learning process must be geared for entrepreneurship and justification why a change in learning is required, it does not address the challenges associated with change. Furthermore, this study would have been more useful if it also addressed the idea of dealing with complexity in learning.

Leadership skills are timeless and relegating them to later phases of student development can be detrimental. From the foregoing, Table 3.4 summarises the emerging issues that pedagogy must consider.

Table 3.4: Summarising Leadership skills in teaching and learning

Entrepreneurial Leadership Oriented factors.	Pedagogical Issues:
Self-Image, Positive Thinking and Self-worth	How can students be taught : 1. Positive self-regard 2. Self-mastery
Transformational Leadership	How can students be taught : 1. Adaptation 2. Pro-activeness.

Vision	How can students be taught : 1. Problem-solving 2. Decision-making 3. Risk-taking, and 4. Strategic initiatives.
Value-based	How can students be taught : 1. Justice 2. Fairness 3. Honesty 4. Discipline 5. Freedom 6. Equality 7. Humanitarianism 8. Loyalty 9. Patriotism 10. Progress 11. Self-fulfilment 12. Pragmatism 13. Courtesy 14. Politeness and 15. Cooperation.
Group Facilitation and team leadership skills.	How can students be taught : 1. Group leadership and influence 2. Team coherence.

Source: Author

In the next section, I will discuss the difficulties associated with change.

3.6 Difficulties Associated with Change

The main objective of this study was to propose a transformation in pedagogy. In that light, it become relevant to look at the challenges relating to change that was embedded in education systems. Such an understanding was critical in informing the change initiatives. Systems Thinking as a paradigm offers a framework of inquiry into why systems fail. The tools in this conceptual framework thus provided rich insights into the systemic forces behind these system failures.

Research shows that many change initiatives can be attributed to systemic challenges. In studies conducted in over a dozen companies, Repenning and Sterman (2001), focused on process improvements and the dynamics of implementation of organisational change using system dynamics. Their findings suggest that failures of change initiatives were embedded systemic structures. Any change initiative was greatly affected by the interactions of any chosen change tool with the context - the economic, social, and psychological structures.

While the findings applied to business, they are applicable to the study context, given that curriculum change is embedded in the spectrum of institutions of learning.

Perhaps the most illuminating work I found on why changes fail, is discussed by Sterman (2000a, 2002). In his book *Business Dynamics*, Sterman discusses various critical reasons why systems fail. One aspect raised by Sterman was that many well-intentioned efforts to resolve problems often resulted in unintended consequences. In fact, the interventions were often defeated by the response of the system to the intervention itself.

The concept of policy resistance is still relevant today. In addition, as long as leaders continue with a limited world view, looking at problems as discreet events, they will not only fail to solve our problems, but will in turn create new ones. Some barriers to change emanate from failure to appreciate the dynamics of the feedback processes in complex systems. First, what appears to be unchanging in the short-term, will change in the long-term. To that end, systems thinkers take the view that meaning and reality are dynamic (Davis and Sumara (2006). This idea of dynamic complexity thinking raised by Sumara echoes the work of (Sterman 2000a) and what becomes clear is that while many complex systems (CS) are inherently stable, such stability may be illusionary in relation to time, meaning, context, and space.

Another important blind spot in change emanates from failure to appreciate that systems are self-organising. The dynamics of a self-organising system are influenced by its internal structure (Jackson 2003). Both (Sterman 2000a) and (Jackson 2003) agree that self-organising systems are subject to sensitive dependence on initial conditions. This implies that an imperceptible difference in starting conditions gets amplified and molded by feedback structures leading to radically divergent outcomes.

An equally important aspect in managing change is shifting the blame of policy failure to external factors. In a review article, Ghaffarzadegan, Lyneis and Richardson (2011) highlighted that it was common for politicians to blame policy shortcomings to opposition parties, international enemies, and other exogenous factors. The ‘blame game’ challenge is also common in Zimbabwe. Policy makers need to appreciate that order emerges from the interactions between agents in the system and is not imposed from outside of the system. This calls for both responsibility and accountability in managing change. In essence, systems must be controlled to self-propagate, self-evolve, self-control, and self-preserve. Such controls summons intelligent systems and management of information in order for the system to adapt and also to be effective. The downside of the shifting the blame is that it creates a ‘victim’ mentality - a thinking that one is a creation of, and subject to the actions of others and never about himself. Such a mentality creates a lethargy which culminates in mortality of thinking, creativity

and change. Such thinking crystallises into a culture of laziness and dependency. The sad part of these effects is that once they become culture, they may be inherently passed down to generations.

An introspection in policy issues entails looking at such issue as lack of policy clarity. This means that the overarching policy aims should be clearly outlined down to the specific objectives. There must be a clear definition of roles, accountability, monitoring and evaluation. Without clarity, any reforms are likely to suffer from the absence of a shared vision, and goal congruency. In addition, issues such as duplication of duties and 'red tape' are also encountered. Other challenges associated with change are embedded in the structure of the system. Hussain *et al.* (2018) noted leadership and stakeholder engagement and sharing of knowledge as dominant factors in change management. Hayes (2018) also notes that politics, power, and implementation strategies are important. To the end that there is need for change leadership impediments including: poor support structures and mechanisms, unavailability of mentors and change champions; lack of effective communication; poor feedback and evaluation structures; and a poor climatic environment which supports change (Canterino *et al.* 2020).

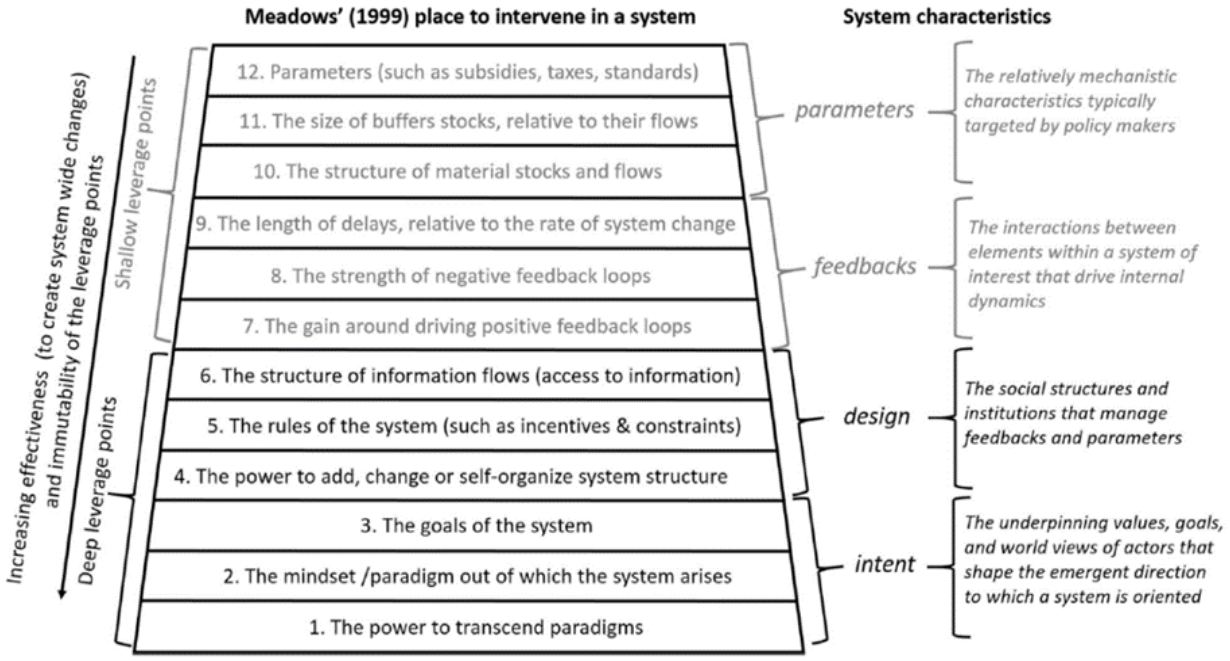
From a systems lens, some of the biggest challenges in change management are the 'soft' aspects. According to Ansari *et al.* (2014), soft issues include the mental models, values, beliefs and strategic intents. The implications of these soft issues is that they affect attitudes and perception. As argued in section 3.3, these soft aspects shape one's worldview. Since the worldview has been described as the lens, the conceptual filters are also affected. By the same token, the mental models structuring the problematic situation and the subsequent interpretation of reality will also be affected. This means that poor perception of both the scope and complexity of the problem will have serious repercussions. It is beyond the scope of this study to exhaust all the challenges associated with change.

3.6.1 Other Systems Approaches in leveraging Change

One of the ideas that informed this study was the work of Meadows (1999); (Meadows and Wright 2008) and Abson *et al.* (2017) on leverage points. In considering the 'how' part of the objective of this study, I found the proposals of leverage points by Meadows handy. Evidence show that unsustainable development trajectories emanate from failure to engage with the deep leverage points of systems (Meadows 1999, 2002; Abson *et al.* 2017). To clarify, both Meadows and Abson agree that effective transformation is anchored on two critical issues, namely the 'where' and 'how' of intervention. This notion assumes that proximal problems are embedded in deep structures that are less obvious but have powerful bearing on the system trajectory. Leverage points (LP) are the critical issues which when changed will have a 'tipping' effect to the whole system trajectory.

Drawing on the work of Meadows and Abson, intervention points are classified into 4 categories; parameters, feedbacks, design and intent as shown in Figure 3.10.

Figure 3.10 Abson's Leverage Points Model



Source: Abson et al. (2017)

With this taxonomy, Abson argues that leverage moves from shallow intervention to deeper as one moves from parameter to intent level intervention. Shedding more light, the parameter level interventions were described as the mechanistic, modifiable characteristics, typically targeted by policy makers. Feedback level interventions are the network of the interacting variables into feedback loops, which are complex and will either be balancing or reinforcing loops. Systems thinkers ascribe the maintenance of the system and system change to an altering of these feedback loops. From a quick perspective, the first 2 appear to be 'hard' aspects of the system, while the design and the intent level are the 'soft' aspects. From Abson's model, the design level is characterised by the social structures to highlight power dynamics, information flow, rules, and all the aspects that manage the hard aspects.

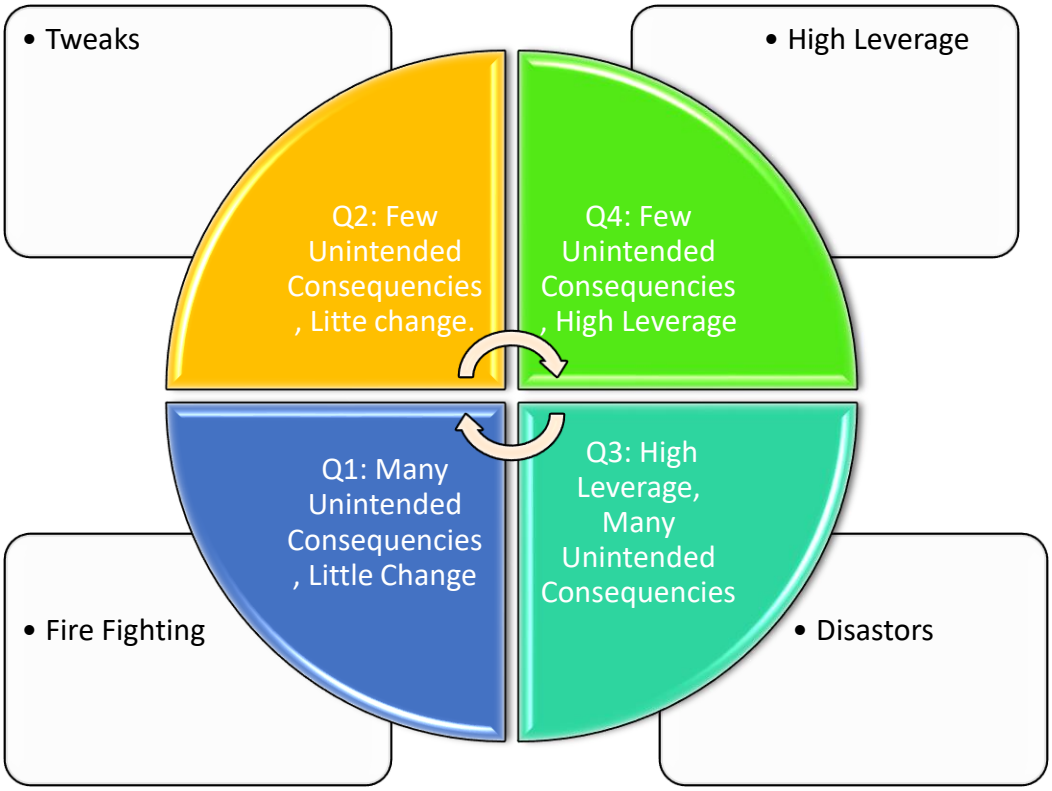
Last on the list, but not the least, is the intent level of intervention. The intent, Abson calls the deeper level which underpins the types and choices of interventions that can be made at the preceding three levels. It comprises

mainly of the system underpinning values, goals, paradigms, and conflicting world views of the actors that shape the emergent trajectory of the system.

A closer look shows similarity between the Iceberg Model discussed in section 3.2 with Abson's leverage points model. Both models speak to the fact that change is embedded in the deeper elements of system structures. Both models also converge on the idea that the apparent issues, or problem proxies are not the real issues. They are rather symptomatic to deeper systemic issues. From the foregoing, analysis of LP entails both identification and classification of the key interventions. In achieving the objectives of this study, I will apply the leverage points framework by Meadows (1999), Meadows (2002), Abson *et al.* (2017) and Williams *et al.* (2017). The variables were identified and classified according to the taxonomy of intervening levels by Abson. Furthermore, the process of structuring the problem, and formulation of Human Activity Systems (HAS) were also informed by the same.

Perhaps the best way that brings the concept of leverage points and unintended consequences together in the context of change is the quadrant mapping as represented by Figure 3.11.

Figure 3.11: Quadrant Mapping



Source: Redrawn from Centre of Disease and Control YouTube video

Figure 3.11 shows four quadrants Q1 to Q4. The first quadrant is characterised by very little changes with many unintended consequences. This phase is described as the firefighting mode. This could be as a result of poor conceptualisation of the problem or poor problem structuring. System Dynamics is a process to illustrate the difficulties associated with change. In the second quadrant, there is very little change and the unintended consequences have been curtailed. While there is a consciousness of the feedback learning in this quadrant, the interventions proposed are not at optimum leverage level. Quadrant three shows what may be termed disasters, where there are radical changes and also many unintended consequences. In such a mode perhaps little consideration would have been given on the relationship of the change variables to the outcomes. The final quadrant demonstrates a high leverage zone with very few unintended effects.

Figure 3.11 therefore demonstrates that there is greater need to think through the issues of change in the context of the whole and the dynamics of the elements in relationship to the intervention. Systems Dynamics offers some insights into such dynamics.

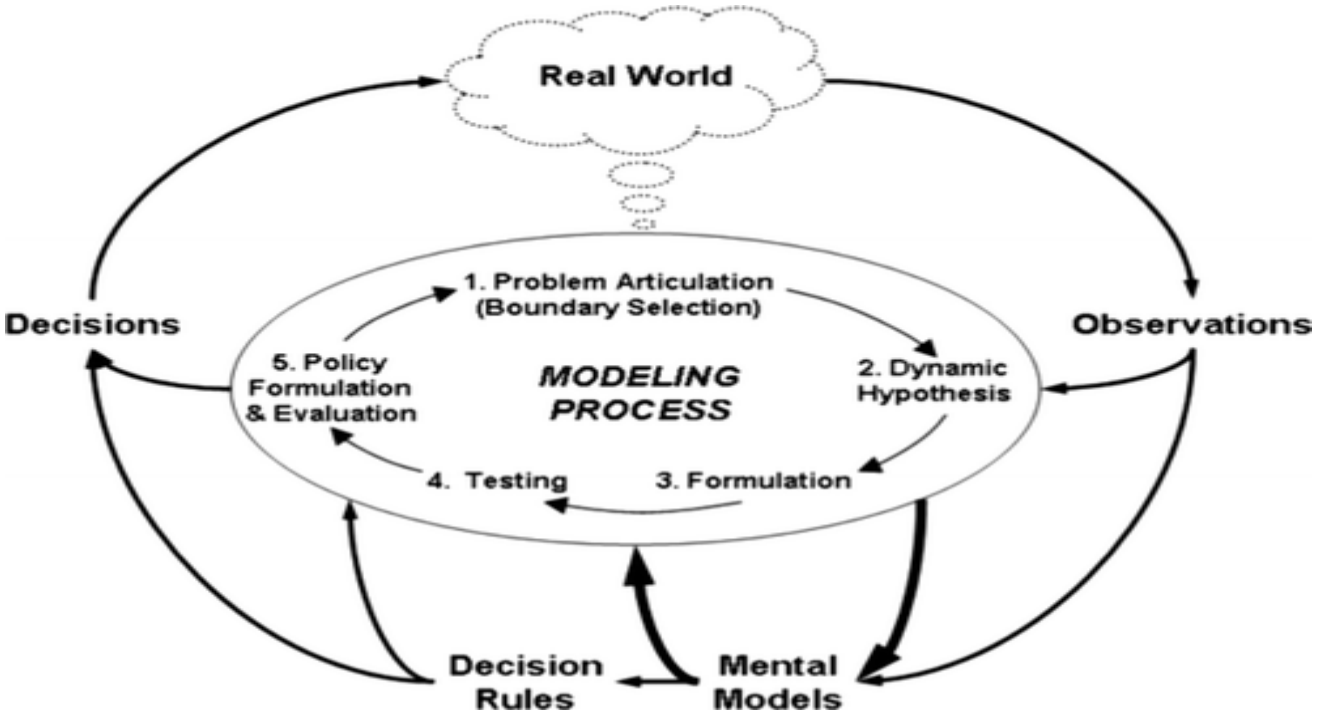
3.6.2 System Dynamics as a process to illustrate the difficulties associated with change

One important tool that provides much into behaviours of systems is System Dynamics (SD). SD traces back to the works of Forrester: Industrial Dynamics (Forrester 1997), Urban Dynamics (Forrester 1970), and World Dynamics (Forrester 1971). It was later popularised by Senge (2006) and Sterman (2000a). SD is grounded in the theory of nonlinear dynamics and feedback controls. As a trans-disciplinary phenomenon, SD draws from engineering, mathematics, and physics. SD enhances learning in complex systems (Sterman 2000: 4). SD tools of simulation models and Causal loop diagrams (CLD) help understand the dynamic complexity, causes of policy resistance, and how they can be leveraged (Jackson 2003).

The basic ontological assumptions of SD are that variables are interconnected in complex dynamic patterns, and that the structure of the system is the principal determinant of the dynamical system behaviour (Peter 1990; Lyneis 2000; Sterman 2000b; Jackson 2003; Morecroft 2015). In addition, there are the interrelations between the multiple feedback loops, constitute the structure and the loops are influenced by the non-linear flow of information, and furthermore that the causal relationships are affected by time delays. The structure is better understood by exploring the system boundary, the network of feedback loops, the rate or flow and stock variables and the leverage points (Jackson 2003).

The phases of the methodology have evolved over the years and the most common is the 5 phase approach (Sterman 2000a): problem structuring; causal loop modelling; dynamic modelling; scenario planning; and modelling, and implementation and organisational learning (Jackson 2003; Reynolds and Holwell 2010). Figure 3.12 is the representation of the SD model.

Figure 3.12 System Dynamics Iterative Model



Source: Adapted from: Sterman (2000a: 88)

The effectiveness of SD, and its benefits are embedded in the design of the methodology and the wider application across disciplines. SD is designed as a learning tool for dynamic complex systems, and this is achieved through the flight simulators, CLD and the stock and flow diagrams. Firstly, computer simulation models are created allowing for a virtual experimentation with the system change policies. Software that have been used include Powersim (Bergen, Norway), Vensim (Ventana Systems, Harvard, MA), and STELLA (ISEE Systems, Lebanon, NH). Studies show that simulation expands mental model boundaries and evidence-based learning (Sterman 2006), and helps with better decisions through alignment of the mental model structure to the structure of the external system it represents (Cavaleri and Sterman 1997; Capelo and Dias 2009). Secondly, SD modelers have widely used CLD, a diagrammatic scheme conveying the relationship among variables. In exploring the notion of causality, SD foregrounds having a holistic perspective to variables, thus the nature of the change is guided by the relationship between the variables. Variables can be linked in balancing loops (B), or in reinforcing loops (R). In balancing loops, variables are related in such a manner that if one variable increases, the loop works to bring the system back to the status quo as with the thermostat, while the reinforcing loop amplifies by prompting growth (acceleration) or decline (decay). Lastly, stock and flow diagrams (SFD) provide an alternative representation of the problem dynamics in stocks (accumulations) and flows (rates). SFDs

are the basis for developing equations for the model. Thus, policy interventions, and policy resistance are explored by SD modelers in order to counteract the unintended effects to the desired goals.

Through SD lenses, unintended effects, counter-intuitive feedback and policy resistance are caused by a narrow, reductionist mental model (linear thinking) that has short time horizons, bounded rationality, attribution error, poor inquiry skills; wishful thinking, underestimating uncertainty, and confirmation bias, and defensive routines (Sterman 2001, 2006, 2010, 2012). On the other hand are a limited understanding of the feedback loops, the system archetypes, and temporal and spatial proximity of cause and effect, temporal precedence of causes, co-variation, poor structured data, similarity of cause and effect and lastly ignoring nonlinearities, time delays, and other elements of dynamic complexity (Reynolds and Holwell 2010). The view that problems do not stem from events, and problems and solutions coexist and are interdependent underpinning SD has yielded better policy initiatives (Zaini *et al.* 2016).

Other studies show that downstream effects of poor performance, organisational failure, and failure to adapt to change is attributed to limited cognitive and ability skills in complex systems (Senge and Sterman 1992). While critics have highlighted the lack of SD to embrace meaning as a social construct, the combination of quantitative modelling, computer simulation, and the advancement in SD software packages has proved the relevance of SD as a methodology. In addition, studies show that SD has been used extensively across disciplines and has yielded positive learning benefits to decision makers.

Bringing it all together, Table 3.5 summarises the challenges that characterise the current system in place. It shows the underpinning forces that drive the system and highlights the characteristics of the desired system. The last column considers the leverage points that will be able to bring meaningful change in the education system.

Table 3.5: Summarising the imbedded challenges and the leverage points

Characteristics of System in place		**Systemic Forces at work in the current system**	**Characteristics of desired system**	**Systemic Leverage points to nudge the system in place**
Learning Approaches	• Learning as acquisition of inert knowledge. • Content-based learning. • A focus on 'know that' • Single subject based learning. • Individual attainment and heroes	• Passive pedagogy. • Theory laden teaching. • Genius mentality	• Experiential interactive learning. • Knowledge construction as opposed to consumption. • A focus on pragmatic knowledge with application social relevance. • Holistic, multivalent learning. • Team work and working with and through others.	• A shift of mindset to complexity, and holistic learning. • Influencing pedagogy towards knowledge construction. • A shift in learning to empower the softer skills in
World view of learning and reality.	• Traditional, simple and linear. • Reality and futures are concrete, certain, and predictable.	• Linearity and reductionist thinking.	• Reality as dynamic, volatile, uncertain, complex, and ambiguous. • Learning is multi-purposive	• Systems Thinking. • An appreciation and application of complexity. • Future oriented global thinking.
Systems of support	• Bur acratic. • Parental detachment in learning activities.	• Top-down management and leadership styles. • In loco parentis	• Flexible, distributed leadership.	• Collaborative learning and teamwork.

Source: Author

3.7 Chapter summary

A review of the literature indicated the need to embrace a new way of looking at the problem in a holistic manner. Amongst the alternative worldviews as discussed in section 3.3.2, this study uses Systems Thinking as an alternative lens of looking at the challenges that are being faced in the education system. It has been argued that learners need to understand the problems around them in the context of how their system of interest related to the whole. An appreciation of the dynamics of the system implies that special attention is placed on the interrelations between the parts in each system. Such an appreciation showed that it offered a gateway to effective problem conceptualisation and the subsequent structuring of the problematic situation. This deeper understanding of the system structure was also useful in identifying the challenges embedded in the education system and the leverage points that were necessary for the proposed changes. In light of the demands of future oriented education, and the challenges that were discussed in Chapter Two, this chapter highlighted both the systemic challenges that were embedded in the education system and the subsequent leverage points in effecting the change. In essence, this chapter provided a justification of why there was need for an improvement for EL in learning in Zimbabwe. Due to the complexity of the change and the challenges which come with multiple world views, Soft Systems Methodology was used in coming up with interventions that would be culturally and technically feasible. The next chapter explores SSM as a methodology in intervening for improving the education system.

CHAPTER FOUR - METHODOLOGY

4.1 Introduction

Having outlined the conceptual framework underpinning this study, this chapter outlines the research methodology adopted for this research. The outcomes of the research process will be discussed in the following chapter. Foremost, I justified the use of the chosen methodology, followed by the application of the methodology on the research. As discussed in the conceptual framework chapter, I took the complexity view that Entrepreneurial Leadership in learning was embedded in the social world, which is intricate, complex, multidimensional, and dynamic. The research process was thus informed by Systems Thinking approaches deemed most appropriate for this kind of study. Thus, having reviewed Jackson (2003) System of Systems Methodologies, I selected as appropriate for my initial investigation into the perspectives of those I enrolled in the Entrepreneurial Leadership project.

4.2 My Research Framework

The System of System Methodology (SoSM) (Jackson and Keys 1984) , as later refined through Creative Holism (Jackson 2003) is a framework developed by leaders in the Systems Thinking field, to assist researchers and consultants in refining their research questions and in determining the most appropriate Systems Thinking approaches to draw on. The approach emphasises the importance of designing a unique research strategy for particular situations that are complex and have multiple players with competing objectives.

My choice of the qualitative research approach was premised on the fact that the study of Entrepreneurial Leadership is socially embedded and is a learned construct. Qualitative research becomes the most appropriate methodology in providing an in-depth understanding of this phenomenon, including the participants that are immersed in the problematic context. Most importantly, as argued by Ritchie *et al.* (2013), data in qualitative research approach are detailed, rich and complex. The analytic methods retains complexities and nuances of the emerging themes. The notion of accommodation of complexities is discussed further in the section below, specifically the Soft Systems Methodology that was used.

Qualitative methods also have methodological rigor (Ritchie *et al.* 2013; Lune and Berg 2016). There are a plethora of qualitative research theories that have stood the test of time, have been widely applied and generated well-founded and trustworthy evidence. To highlight, Soft Systems Methodology which was used has a well-

structured and documented research design as will be demonstrated in the following section. The wide application and defensibility of the outcomes cannot be doubted.

As the reader will note, the outputs of this study apart from influenced by theory, are also shaded with the chosen methodology. Results predominantly include detailed descriptions on EL drawn from the multiple perspectives and submissions of participants. In addition, my reflexive personal research experiences and interpretations are shared.

4.3 Grounded in Soft Systems Methodology

SSM is a research methodology which falls under the category of Action research strategy. Coghlan (2019) defines Action research as a methodology with a dual purpose of bringing action and research. This differentiates it from other inquiry approaches where research is the primary focus and action is considered as incidental, secondary or a by-product. SSM was developed by Checkland in 1985, and has been widely applied as a research approach for over 35 years. In a review of studies applying SSM between 2000 and 2015, Hanafizadeh and Mehrabioun (2018) noted that researchers applied SSM at three levels. At the first level, SSM is used as an inquiry process. At this level SSM enables the users to structure and learn about the problematic situation with the objective of improvement. A closer look at the four stage process of SSM as proposed by Checkland and Poulter (2010) shows that the finding out, modelling and debate stages inform the first stage. Action for improvement constitutes the second level of how SSM has been applied. The third level according to Hanafizadeh and Mehrabioun (2018) involves are hybridisation of the learning process with the action approach of SSM. These findings demonstrate the wider application of SSM as robust research approach.

It is important to highlight that SSM is considered as a research methodology (Checkland and Poulter 2010; Reynolds and Holwell 2010). This is significant because this distinguishes it from other from other qualitative research approaches. This study uses the rich heritage of scientific rigor embedded in this framework and the robustness of this study must be assessed in light of the unique process of the SSM process as discussed in the sections below.

The choice of SSM was strategic: first, it is effective in dealing with “soft variables” of human interactions, managing change and conceptualising ‘messes’ in highly complex environments (Jackson 2003: 137). Second, many players in learning perceive the real world differently, and they construct and attribute diverse meanings to problem contexts (Checkland and Scholes 1990a; Checkland and Poulter 2006; Sterman 2012). SSM thus afforded the opportunity to focus on the participants’ perspectives, and making meaning from their subjective

world views. Through focus groups and interactions, rich lessons emerged from the cultural lens of the participants. Third, SSM is ideal for complex problems whose boundaries are ill-structured and ever-changing. To explain, the needs of learners, industry and the society are in a constant flux. Undoubtedly the problem boundaries and content are changing over time. Globalisation and the age of 'the internet of things' have drastically changed the learning landscape. Fourth, SSM offers an iterative inquiry approach, which affords learning, debate and reflection (Reynolds and Holwell 2010: 77). Fifth, I adopted SSM's 'complex systemic' approach, assuming that processes and patterns in learning were both non-linear and have multiple stakeholders with multiple purposeful activities (Reynolds and Holwell 2010: 192).

Overall, SSM assumes that effective change must have 'accommodation', a balance of power which is acceptable and culturally, and technically feasible. There could not any better methodology to best suit the soft issues in the research problem, and to deal with the complexity than SSM. SSM and its stages are discussed fully in the following section to provide a grounding of the progression of the methodology which guided the research process.

4.4 Soft Systems Methodology (SSM)

SSM is an action-research methodology that was developed by (Checkland 1981; Checkland 1999b)and has been further improved over the years. According to Checkland (1999a), SSM aim to bring improvements into areas of social concern whose problems are ill-defined, and difficult to structure. Stakeholders who are immersed in that problem area are involved in a learning cycle which takes an iterative process of using system concepts to reflect upon and debate perceptions of the real world. Originally, the underpinning philosophy of the methodology was to counter the limitations of hard systems thinking (HST), which include inability to handle: complexity; multiplicity of values and beliefs; politics and power; human interactions or the human activity systems; and multiple perceptions of reality (Jackson 2003).

HST was goal-oriented, with strong emphasis on explicit problem definition and solutions. Jackson argues that problem contexts exhibit greater complexity, change and diversity, which posits a challenge to HST assumptions and methodologies. SSM therefore curtails the gaps in HST, taking into account: political factors, power influence, culture, ideology, and personal and group interests - which are referred to as the soft variables (Rodríguez-Ulloa, Montbrun and Martínez-Vicente 2011). The word "system" in SSM is used as a conceptual model of reality.

Checkland and Poulter (2006) argue that SSM provides a learning opportunity through the use of reflective discourse and debate. In agreement, Gerwel and Bodhanya (2014) also cite the effectiveness of SSM in bringing about learning and change. According to Gerwel and Bodhanya (2014), this 'learning and change' depends on facilitation, group processes, decision making, power, leadership and conflict management.

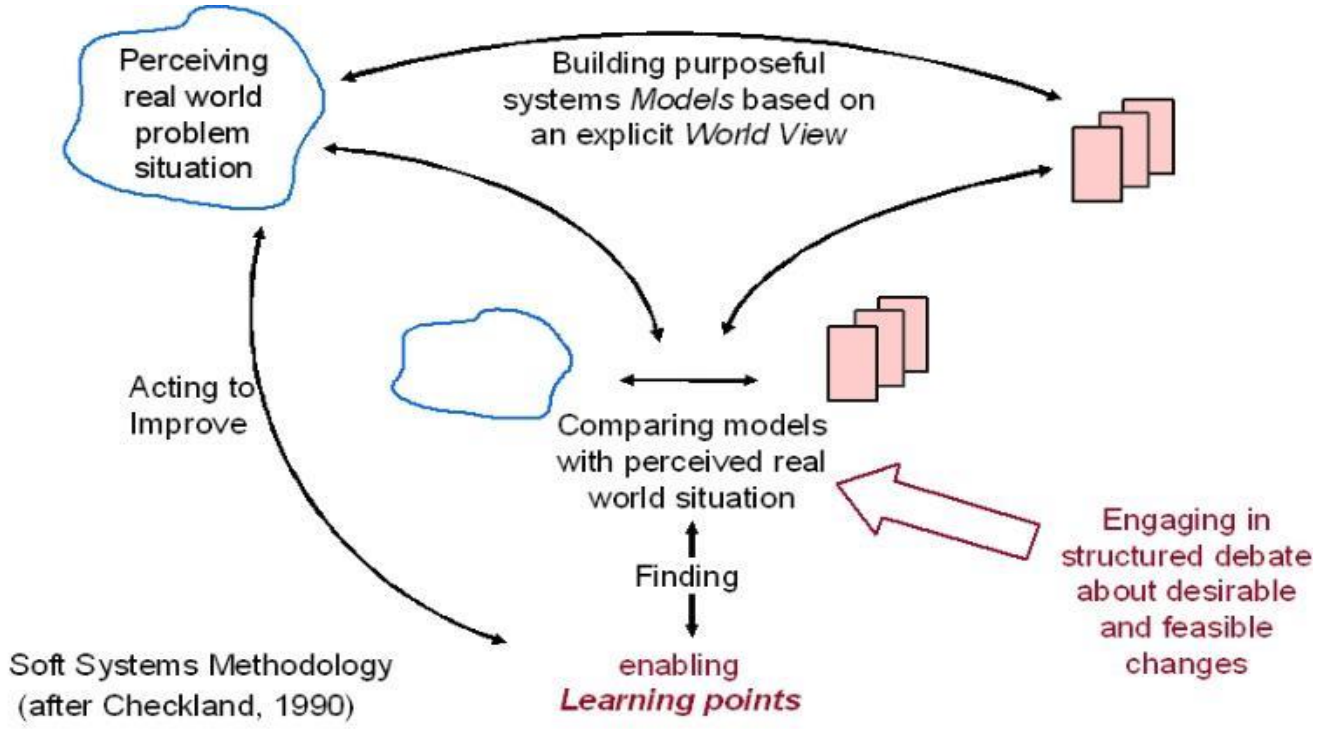
4.4.1 Discussion

Why do we use SD, despite the increase in knowledge, analytic power and policy initiatives, and the fact that the current challenges we face in education are not solved by the policy interventions? From an SD standpoint, it is clear that the challenges that we currently face are actually caused by the solutions that are currently implemented. Short time horizons, lack of feedback loop thinking, and open loop (linear) thinking are among the weaknesses. Unless reality is perceived as an emergent iterative process between our actions and the feedback, then the education system is 'trapped' in a vicious circle that will culminate in its demise. The choice of SD is premised on the fact that Simulation, CLD, and stock and flow diagrams will provide insights that will improve the scope of our mental models as we tackle problems.

4.4.2 Methodology

The methodology is divided into four sections: firstly, getting an understanding of or conceptualising the problematic situation; secondly developing relevant purposeful Human Activity Systems (HAS) or conceptual models, finding accommodation through facilitation; thirdly HAS are compared with the real world; and lastly action is taken into the situation based on the agreed changes with a fit culturally and technically. Furthermore, since there are various players who have multiple worldviews and competing demands, there is need for balancing the power, and political aspect of the organisation (Checkland 1999a). Figure 4.1 summarises the process methodology.

Figure 4.1: Checkland's Soft Systems Methodology



Source: Reynolds and Holwell (2010:207)

4.4.2.1 SSM Stages

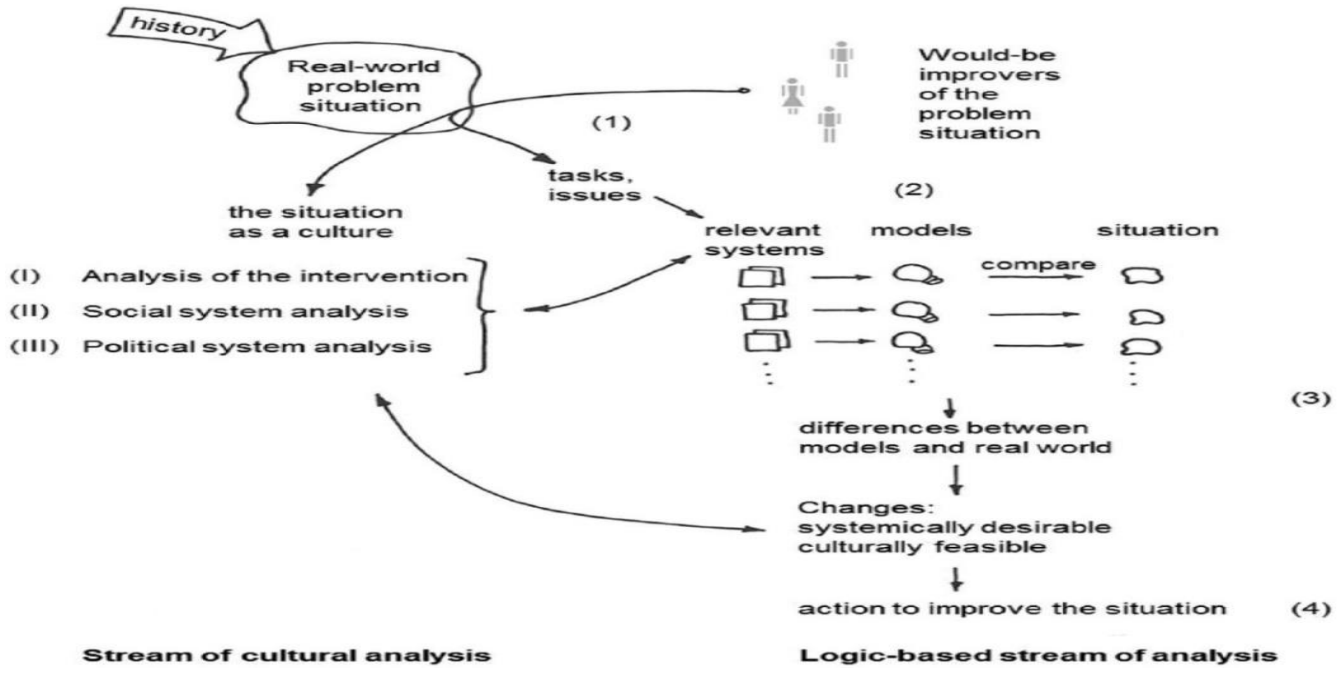
Stage 1: Problem definition

The first stage in SSM is ascertaining the problematical situation, analysis of issues, context, culture and power. Problems are assumed to be soft (Rodríguez-Ulloa, Montbrun and Martínez-Vicente 2011), meaning the world is assumed to consist of complex interacting systems (Checkland 1999a) boundary and structure are difficult to define, and solutions and problems co-exist. Problem contexts are considered problematical, implying that the problems are ill-defined (Checkland and Poulter 2006) and solved by more than one method (Methodology), and have more than a single solution. SSM assumes an interpretative perspective of social settings. At this phase, SSM adopts tools of Rich Pictures, which will illustrate stakeholders, structures, processes, common concerns and interests.

According to Checkland, the objective of this phase is to form the richest picture of the problem situation and through inquiry, and a structured process, the problem context will be analysed. In boundary structuring, Rich

Pictures are drawn depicting the main relationships, players, significant and or contentious aspects (Luckett and Grossenbacher 2003), further probing more debate on the purposeful actions and the perceptions causing disagreements. Information is gathered through focus group workshops, meetings, interviews, analysis of policy documents and observations. The aim will be to capture the problem variables as perceived, to identify the main actors, entity structure, problem leverage points, and viewpoints in the situation (Reynolds and Holwell 2010). In order to find out more about the problem situation, (Checkland and Scholes 1990b) proposed a two-stream analysis as summarised in Figure 4.2.

Figure 4.2: Checkland's 2 Stream Analysis



Source: Jackson (2003:189)

The first stream of cultural analysis is an understanding of the cultural dimensions. According to Checkland, the cultural analysis is done at three different levels (Analysis 1, 2 and 3). Analysis 1 explores the intervention context (the methodology, use of the methodology, and the practitioner's use of the methodology), considering clients, problem owners and problem solvers. Ideas are generated about relevant world views leading to ideas for relevant models at this level (Reynolds and Holwell 2010). Analysis 2, social system analysis, understanding the role, norms and values; and Analysis 3, political system analysis exploring the power dispositions and the process of containing power; how its power is obtained, used, protected, defended, passed on or relinquished, outlining the process of seeking accommodation that are culturally desirable and feasible.

The second stream is the logic-based analysis. According to Reynolds and Holwell (2010), this process entails enquiring into the tasks and issues of the problematical situation.

Stage 2: Constructing Relevant Purposeful Activity Models

HAS models are constructed in order to facilitate debate, and enable accommodation in decision making, highlighting desirable and culturally feasible actions to improve the situation. The HAS comprise of the Root Definition (RD) and the Conceptual Model (CM). According to Wilson (2001), The RD expresses what the system is, while the CM outlines the activities that must be done by the system in order to achieve the intended transformation. The RD can be created on what has been called the PQR model: P (what the system must do); Q (By what means); and R (the intended goal to be achieved). Each RD is premised on a *Weltanschaaung* or world view, justifying the 'how' and 'why' of the system. According to Checkland, the defensibility of each RD are tested by CATWOE device. CATWOE is a mnemonic for Customers, Actors, Transformation, Worldviews, Owners, and Environment. In essence the formulation of each RD must be based on the six components comprising the CATWOE.

Facilitation

Facilitation has proved to be an effective approach to qualitative inquiry (Cundill *et al.* 2012). In SSM, the interveners are not viewed as change champions with prescriptive ideas that will provide a panacea to the problems, rather, they take a facilitative role. The facilitator has to deal with highly contested issues, the process of clarifying and exposing differing frames of reference, or mental models, the facilitator has to construct meaning from the participants. This requires a broader scope in the assumptions, norms, beliefs, values that the observer will use as a lens in filtering and interpreting the different world views of the participants. The proceedings must be controlled in such way as to promote debate, and also ensuring that participants will get equal opportunity and attention.

Moreover, facilitation can be a trigger of innovation, debate, alternative frames of reference, collaboration, accommodation, engagement, further inquiry, learning and change. All-in-all, moving toward a shared understanding requires special efforts, insights, and time. Thus, from a skilled facilitator, and effective stakeholder engagement, emerges relevant reflective engagement needed to transcend, or break with existing social norms, group thinking, and personal biases. From the foregoing, all facilitation was conducted in a manner that informed the study with deep insights, while maintaining the rich nuances.

Stage 3: Comparison Phase

The third stage involves comparing the HAS models with the real world, and the objective is achieved through structured discussion or debate. The objective is the generation of ideas which are targeted at desirable and culturally feasible transformations.

Stage 4: Action

The process of this phase is accommodation seeking between divergent world views (*Weltanschaaung*) (Reynolds and Holwell 2010). The purpose of this phase is to balance the power dynamics, and level out the 'politics' that may hamper the remedial action into the problematic situation. From Checkland's view the accommodations are based on two key criteria: First, the proposed changes must be systemically desirable. Second, they must be culturally feasible. This implies that the changes must fit into the context in which is proposed for. Stage four represents the last stage of SSM.

The use of SSM as the predominant methodology is premised on its attributes of eschewing ill-structured boundary definitions, quick fixes and parochial rationality. The context in learning of sciences presents what Jackson (2003) describes as messy or problematical. Furthermore, the education system may be classified as open or closed, independent or nested. SSM accommodated these ambiguities, uncertainties, disagreements, and conflicts that were embedded in the problematic context. As Reynolds and Holwell (2010) puts it, SSM embraces an accommodative paradigm to different viewpoints and players. This implies that a broad base of ideas, experience and expertise is brought to a consultative forum. Such wider consultation comes with depth, richness, and broad perspectives, which when well harnessed will impact positively the outcomes. In seeking accommodation, the bargaining and negotiation breeds an extra component of emergent perspective that is crucial in change.

In terms of change, SSM encourages creative thinking about improvement and change (Jacobs 2004). With the same mind, we draw from the 6 benefits outlined by Jacobs: first, approaching issues holistically; second, having a coherent change policy perspective; thirdly, recognising and exploring problem situations; fourth, surfacing discourses and meanings; fifth, regarding strategy as multidimensional (this is achieved by formulating focus groups from different management strata, with divergent strategic policy orientations); and lastly, modelling purposeful activity systems for transformation, and aiding strategic thinking. SSM modelling and comparison helps communicate actionable priorities (Jacobs 2004). Given these benefits, the robustness of SSM is rather confirmed.

Moreover, SSM has been applied in diverse contexts as a tool for improvement, learning and change (Luckett and Grossenbacher 2003; Molineux and Haslett 2007). Additionally, SSM-based inquiry has been proved to be responsive to the diversity and richness of the social world reality, more so, in handling their intricate and multidimensional variables (Reynolds and Holwell 2010). The research therefore draws on the rich experience of the use and application of SSM on a variety of contexts, and will be guided by ST theoretical underpinnings in the approach. The following section summaries SSM and more of it will be in the research methodology chapter.

Discussion

The choice of the SSM was premised on the following principles:

Firstly, emphasis is placed on problem identification, problem structuring, and problem resolution, rather than on problem solution. The EL discourse cannot be solved with a single solution and needs problem articulation. The EL system boundaries and activities are complex and dynamic.

Secondly, there is the acceptance of multiple problem-perspectives, so that pragmatic interventions will emerge. According to Houghton and Ledington (2002), SSM embraces the interpretive subjective approach to reality based on the assumption that social reality is an emergent social process created continually by humans in the social world, furthermore, it is influenced by a network of assumptions and inter-subjectively shared meanings.

Thirdly, the change interventions are bottom-up, and by consensus and participation rather than imposition.

Fourthly, there is also the iterative and continual re-evaluation challenge automatic acceptance of existing structures and the status quo.

Lastly, by engaging with people who are qualified in the field, effective models will be formulated. Additionally, model simulation, and increased communication, will bring about a sense of model ownership, increased likelihood of model confidence, and increased probability of implementing recommendations.
It is important to realise that AR unlike the other qualitative research methods, assumes that practitioners are inextricably immersed and intertwined with their complex environment (Leitch, McMullan and Harrison 2013). To explain, Chia and Holt (2008) highlight that there is mutual sympathy between attribution of meaning and the context. This view implies that the practitioners' attribution of meaning is iterative and rather integrates him/

her with the context. With this in mind, formulation of theory was based on this 'immersed', interpretive approach. Furthermore, interpretations and analysis made in this study were influenced by the experiences, background, knowledge and context of the writer.

Having discussed the two main theoretical frameworks (SSM and SD) used in abstracting this work, I now summarise the applicable theoretical tools drawn from these frameworks in Table 4.1.

Table 4.1: Summary of the theories and the specific tools applied in this study

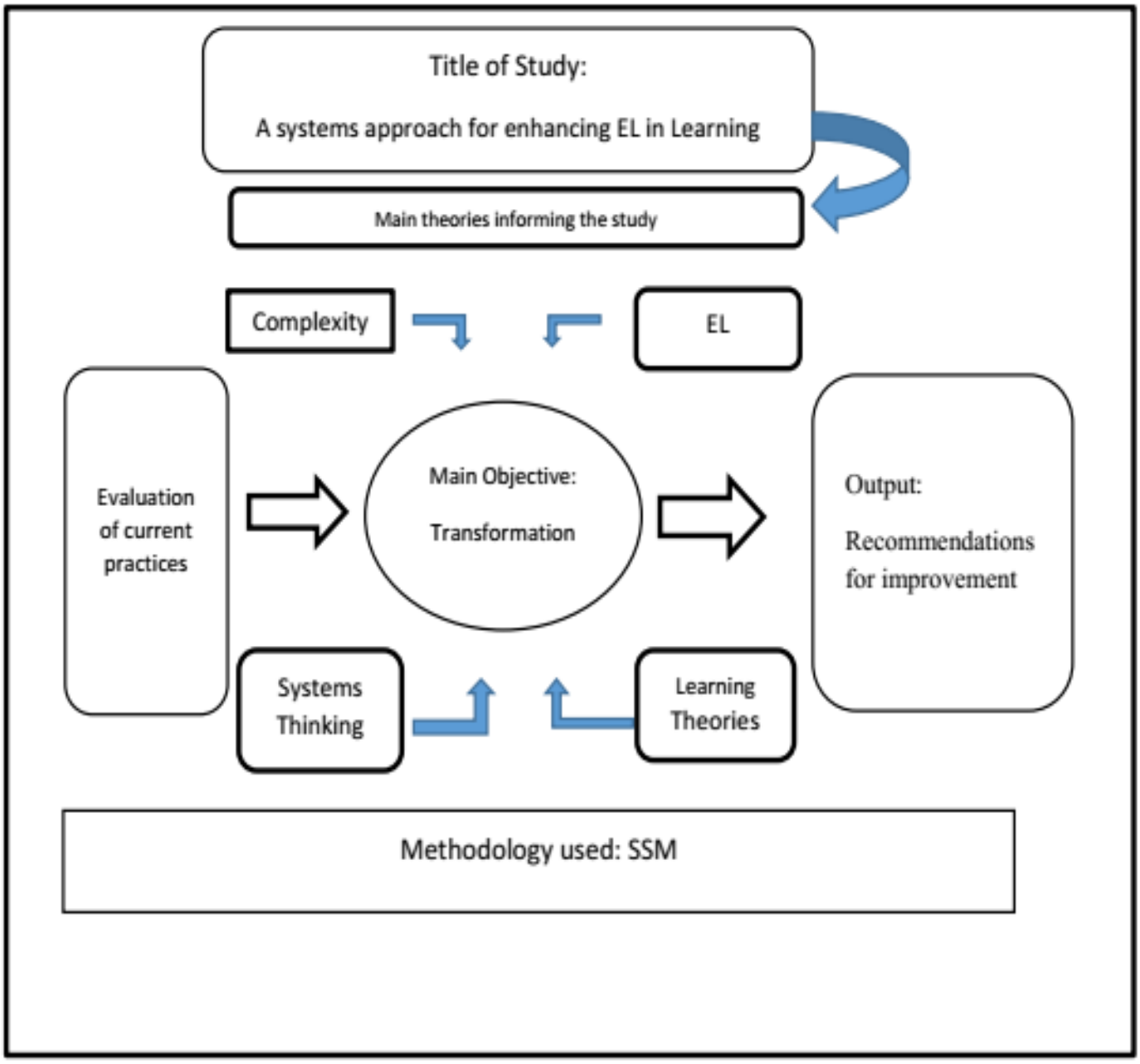
Phase of Study	**Theoretical Framework**	**Tools applied**
Stage 1 - Problem Definition	SSM	Rich pictures
		CATWOE analysis
Stage 2 - Constructing Relevant Purposeful Activity Models	SSM, learning theories	HAS MODELS
	SD,	CLD
Comparison Phase	SSM	REVISED HAS MODELS

Source: Author

4.4.3 Summary of Conceptual Framework

In order to outline the framework underpinning this study, Figure 4.3 below sums what has been considered as the guiding CF.

Figure 4.3: Summary of Conceptual Framework



Source: Author

I have the conviction that small changes to the initial conditions in learning can be magnified intrinsically resulting in major changes summed up as the butterfly effect (Siemens 2014).

4.5 Application of SSM

4.5.1 Stage 1

The starting point of SSM requires having the richest possible picture of the area of concern. This stage thus entailed understanding how the teaching of EL can be improved through the use of SSM tools – Rich Picture (RP). The RP included the relevant entities in teaching and learning of EL, their interests, issues, areas of conflict, and how the issues in the area of concern were linked. In expressing the problematic situation RP contain both symbols, activities and words in pictorial representation. As shall be discussed later, the choice of relevant models of improvement were informed by the RP. The RP enabled the structuring of the subsequent phases of the research process.

In entering into the problem, I used semi-structured interviews to gain an understanding of the issues and themes in the teaching and learning of EL. While that information could be obtained from focus group discussion, the semi-structured interviews were chosen to give the rich insights into the problem articulation process. Engaging parents and other participants as specified in the population enriched my appreciation of the structure and nature of EL in teaching and learning generally in Zimbabwe and at HSC more specifically. This provided a 'flair' which was rather contextual and differed from evidence to the problems as was drawn from previous studies in the literature review. To be precise, case-specific problems emerged. In coming up with the RP, emphasis was placed on the structure of teaching of EL and the processes. The processes and structure generally give the tone climate or the environment of problem. Since the environment is shaded by culture, the cultural dimensions of HSC and the teaching of EL were done in three different levels (Analysis 1-3) as outlined in the sections below.

The main research tools that were used at this problem articulation phase also included: the CATWOE analysis, interviews, and focus groups. The tools and outcomes are summarised in Table 4. 2.

Table 4.2: Summary of research tools, focus areas and outcomes

Stage 1	**Research tool/ Instrument**	**Focus area/ Key questions**	**Outcomes**
Problem conceptualisation	1. Interviews with MoPSE directors. 2. Semi-structure Questionnaires to parents and students.	Understanding the nature of the problem, culture, tasks and the world views of the problem owners and actors.	Feedback from interviews and questionnaires
	3. Meeting HSC management. 4. Focus group workshop 1		• Spray Diagrams. • CATWOE Analysis • Rich Pictures

Source: Author

Information from the interviews and the focus groups was transcribed and analysed. Major themes and issues were used to construct the RP, and the link of the themes are represented both in RP and spray diagrams in the findings chapter. In keeping with the major focus of the study, to improve the teaching and learning of EL in schools, the following research questions informed this stage:

1. What are the prevailing conditions regarding entrepreneurship in schools?
2. Why has EL emerged as being necessary and important?

The main objective of this phase was to generate ideas from the diverse world views (Reynolds and Holwell 2010). These ideas provided insights into the third research objective: why we need to move from simply being able to measure potential in entrepreneurship to making it a core competence required for the emerging present and future.

4.5.1.1 Stage 1 process

The first stage involved meeting with management and staff of HSC, the CEO, Finance director, and three principals of the three centres of HSC. The purpose of the initial meeting was to explain the research objectives and the methodology applied. A schedule of workshops (Table 4.3) was presented and authorisation sought for

the workshops. The ground rules were explained to senior management. The practitioner explained the need of forming democratic groups in keeping with the spirit of SSM in order to encourage debate, openness and unrestricted exchange of knowledge and information. In compliance with the college working times and schedule, the workshops were scheduled at times that were convenient to both staff and management. After the management meeting, interviews and focus group workshops were scheduled as below:

Table 4.3: Meeting Schedule

Event	Date	Purpose	Targeted Population
Meeting 1	March 2017	Explain purpose of research, research methodology, and outcomes.	Senior management and B.O.D
Interviews 1	August 2019	Conceptualising the problem	Learners, Teachers, Parents.
Focus group 1	September 2019	1 Introducing SSM Methodology. 2. Conceptualising the problem. Using CATWOE, Spray diagrams.	Principals, Head of Academics, Teachers, learners.
Focus group 2	October 2019	Construction of the RP, and modification of the RP	Principals, Head of Academics, Teachers, learners.

Source: Author

4.5.1.2 Cultural Analysis of HSC

The stream of cultural analysis involved an understanding of the cultural dimensions of HSC and the purpose was to inform the logical line of entrepreneurial leadership issues in learning issues to be addressed and to frame the accommodation process. Guided by Checkland's SSM, the cultural analysis was done at three different levels (Analysis 1, 2 and 3).

4.5.1.3 Analysis One (The intervention)

According to Reynolds and Holwell (2010), analysis one explores the intervention context (the methodology, use of the methodology, and the practitioner's use of the methodology) it considers clients, problem owners and problem solvers. Ideas are generated about relevant world views leading to ideas for relevant models at this level.

The practitioner is a principal at one of the centres of HSC. While the research interests were driven by the research objectives, the lack of entrepreneurial leadership skills affects the learner, the parent, the society, industry, schools, tertiary institutions, and the government. Problem solvers according to the literature review include: the teachers, school administration, parents and the ministry of primary education (MoPSE). The practitioner obtained authorisation from MoPSE to interview senior education administrators in the ministry (Appendix 3), again, gate keepers from HSC management provided access to the teaching staff and administration (Appendix 4). The study also involved students, and in keeping with DUT ethical standards, both student and parental consent were sought (Appendix 5, and 6).

SSM workshops were conducted at the 4 centres of HSC. The participants in the workshop ranged between 10 and 15 persons, mainly teachers, head teachers, principals, students and interested parents. The participants had diverse backgrounds; contextually, academically, and experience. Some came from Mutare which is the third largest town in Zimbabwe, while the rest were drawn from Harare, the capital city.

The aims of the first workshop was to:

1. Introduce the research objectives; research methodology (SSM) - basics principles and concepts.
2. Introduce the participants in SSM tools - Rich Pictures, Root definitions, and the CATWOE analysis.
3. Engage the participants in active debate in order to bring change in learning to meet the research objectives.

After the introduction of SSM to the participants, the next stage of the workshop was to address two fundamental questions:

1. What are the prevailing conditions regarding entrepreneurship in schools?
2. Why has EL emerged as being so necessary and important?

The purpose of the first question was to have the participants define the problem, problem owners, problem solvers, and the problem boundaries. All participants were given an evaluation form of the teaching and learning process (Appendix 6).

Participants were divided into three small groups of four, and the practitioner used the 'Knowledge Café' approach and asked the participants to construct spray diagrams showing the key players, problems and how they are connected to the problem of EL in teaching. The spray diagrams were a precursor to RP, and also to help the participants to see the connectedness of the issues and the stakeholders.

Three members of the group were then rotated, leaving the group leader. Upon rotation, the participants that had 'moved', were requested to analyse the spray diagram of the new group and to discuss their observations highlight any additions and omission made on their spray diagram. In consultation with the group leader, the 'new group' was requested to make additions to the first drafts of the spray diagrams.

The objectives of this exercise were:

1. To enhance the richness of the problem definition and also to help the participants to be 'systemic' and to appreciate the interconnectedness of problem variables in EL in learning.
2. To help the participants to realise fully the problem situation and also to express it fully.
3. To help the participants to learn about the problem situation, challenge their worldviews, and help them identify the 'emerging' issues that would help in designing and redesigning policies that would enhance EL in learning.
4. To help in coming up with contextually feasible improvements in the learning of EL in schools.

Through facilitation, emphasis was placed on sharing insights and understanding meanings and connections. The result was to uncover the complexities in EL in learning and to draft RP that would detail the variables in EL in learning.

4.5.1.4 Analysis 2

Analysis 2 involved Social system analysis; understanding the role, norms and values. The role holders in entrepreneurial leadership in learning include the government, MoPSE, tertiary institutions, teachers, school principals, students, parents, industry and employers.

Pertaining to the norms, the MOPSE has oversight over the formulation of the curricula, implementation and administration. Students are examined by Zimbabwe Schools Examination Council (ZIMSEC) whose oversight and management complies with the curricula as set by the MoPSE. The last curricula review of 1990 culminated into the Nziramasanga report as referred to in this study. The recommendations of this report were implemented in 2016 with great resistance from school administrators, teachers and parents. Moving from a colonial background, Zimbabwe needed to align its curricula to the pressing needs and demands of the fast paced 21st century. This included a shift from a knowledge based to a more practical based way of learning.

While the MoPSE is the major custodian of curricula formulation, power is vested in the teacher (educator/ classroom practitioner) who implements the curricula in the classroom. The inclusion of teachers in the workshops was both strategic and purposive.

4.5.1.5 Analysis 3

This formed the last phase of the cultural analysis process. It involved the Political system analysis; exploring the power dispositions and the process of containing power; how its power was obtained, used, protected, defended, passed on or relinquished. It also involved outlining the process of seeking accommodation that was considered culturally desirable and feasible. Having mapped out the different interests, there was a need to reach an accommodation. Commodities of power were identified; the process of containing power; how power was obtained, used, protected, defended, passed on or relinquished. The outcome of this phase was a Rich picture (RP). Each centre had a representation of the problematic situation using a RP. Using a knowledge café approach, focus groups were asked to identify the differences in RP from other centres. As discussed earlier, a RP attempts to express the areas of concern in both symbols and words. In drawing the rich picture my areas of concern were as follows:

1. What are the relationships among the pieces of the system?
2. How do the relationships affect understanding of the whole system of learning?
3. What are the different perspectives of the system of learning EL?
4. How can the diverse perspectives work together to benefit the teaching and learning of EL in schools?
5. Can there be transfer of learning among the learning system?

RP were used to capture all the elements; teaching and learning structures; the world views in the problem situation; recognised issues and potential ones. Information captured in the RP helped in capturing all the relevant issues which informed the root definitions (RD) which will be discussed further in the next section.

4.5.1.6 Summary of Stage 1

The first stage entailed getting a rich description of the teaching and learning of EL at HSC. The structure, processes and the context were explored. Cultural analysis was done in three phases, and the purpose of this cultural analysis is to inform the logical line of inquiry which will be discussed in the following sections. The framing of accommodations as discussed in Chapter Two were informed from the same.

4.5.2 Stage 2: Constructing Relevant Purposeful Activity Models

The next phase of the methodology involved deriving appropriate and relevant Human Activity Systems (HAS) from the RPs. HAS were used in identifying what needed to be done, and also in identifying subsequent systems of analysis. According to Wilson (2001a), HAS comprise two important aspects; Root Definitions (RD) - which describe what the system is, and Conceptual Model (CM) – which describe what the system must do. With such categorisation, Wilson shows that the link between the RD and CM is that of 'being' and 'doing'. On the contrary, Reynolds and Holwell (2010) outlines 3 important factors constituting a RD:

1. What the system has to do (P)
2. How (Q)
3. Why (R)

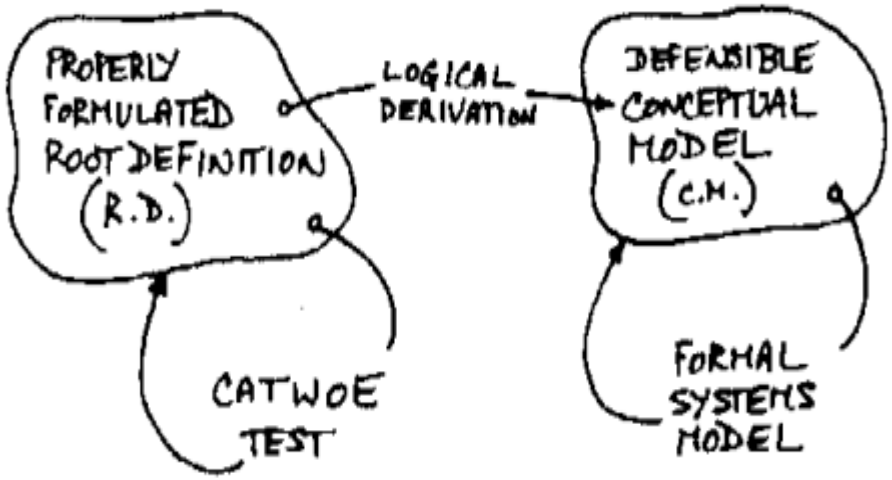
System thinkers refer to the three factors outlined above as the PQR model: describing a system to do P by Q in order to R. A closer look shows that the RD according to Howell consolidates the idea of Wilson (2001a) into one. Furthermore, adding an extra component - the 'why' of the system. It is not the objective if this study to

zero in on the differences. Both approaches informed this study in the construction of the HAS. For purposes of clarity the term HAS was used, and a clear distinction of RD and CM was chosen for intellectual clarity.

4.5.2.1 Root Definitions (RD)

As discussed in section 4.4, the purpose of the RD was to capture the purpose of the system. An important point to note is that the RD described the intellectual construct, a process of investigating the real world. This study took the Wilson's model that a RD describes ways of thinking about reality, and furthermore it informs the CM formulation. The view that each RD is tested by a CATWOE, and a CM is formulated for each RD. This relationship as outlined in Figure 4.4 was adopted in the formulation of both RD and CMs.

Figure 4.4: Relationship between RD, CM, CATWOE and Formal System Model



Source: Wilson (2001: 23)

Drawing from Wilson (2001a), the CATWOE analysis was used to enrich the RD and again to evaluate the completeness of both the RD and subsequently the CM. In formulating the HAS, I was guided by the study's main research objective: A system to enhance EL, by SSM in order to equip students with EL skills. The sub systems discussed later were informed both by literature and the problem conceptualisation process.

4.5.2.2 Transformations

Central to CATWOE are the transformations, which are critical in improving the learning of EL. As highlighted in section 3.6.1, the study adopted the 4 stage classification by (Abson *et al.* 2017).

The interventions were classified into:

1. Parameters level interventions: the mechanistic, modifiable characteristics typically targeted by policy makers.
2. Feedback level interventions (FBLI): the interactions between system elements that drive the internal systems. In analysing the FBLI, the researcher will draw from the system dynamics of feedback loops.

Classes 1, and 2 described above are classified by Meadows as shallow leverage points, while 3, and 4 described below as deep level leverage points. This classification was strategic, as most of the deep level leverage points are 'soft' in nature.

3. Design level intervention: This class will explore the social structures and institutions that manage the shallow level interventions.
4. Intent Level interventions: These interventions include the goals of the system, the underpinning values, and WV that shape the emergent direction of the intended system.

In coming up with CM models of the required activities, Checkland's 7 + 2 model was applied. CMs outline the activities needed in order to bring the transformations. In analysing the performance of the CM, I applied again the 3E's model from the same author:

1. Efficacy (E_1) - is the CM producing an output which is working?
2. Efficiency (E_2) – does the CM use minimum resources?
3. Effectiveness (E_3) - will the CM achieve the higher level or intended long term aims?

A desirable model thus judged on the criteria of satisfying the 3E's framework.

Research objectives addressed at this stage included the following:

1. Why we need to move from simply being able to measure potential in entrepreneurship to making it a core competency required for the emerging present and future
2. How can we best learn entrepreneurial leadership?
3. What does this mean for the curriculum and school culture?
4. Why is all of this important for Zimbabwe?
5. What are the initial conditions that you have to work with and what are the strategic conversations you need to engage in?

4.5.2.3 Validation and Logic on the HAS

Since HAS are intellectual models, they could not be validated by tests against real world situations. Rather, a 'defensible logic' as proffered by Wilson (2001) was used. The underpinning principles of this defensible logic were: was the purposes of each HAS relevant to the real world? This involved a critical evaluation of the usefulness HAS on real world being investigated.

4.5.2.4 Stage 2 Summary

At this stage HAS were formulated, comprising of the RD (what the system is) and CM (what the system must do). Central to each RD was the Transformation (T) elements T and world view (W). The pneumonic CATWOE was used in testing each RD. Each RD was validated on its defensible logic and the CM informed by the RD was formulated. Following Checkland's 4 stage model, the HAS that were formulated, were compared with the real world which is the subject of the next section.

4.5.2.5 Facilitation Role

Given the novelty of SSM to the participants, the facilitation role was critical both in engaging and in controlling the course of the debate. In dealing with multiple world views and critical engagement, facilitation becomes an effective tool in qualitative inquiry (Cundill et al. 2012). Consistent with SSM thinking, I entered the problematic situation not as change champion with prescriptive ideas that will provide a panacea to the problems, but rather, I took a facilitative role. Apart from dealing with highly contested issues, there was need of clarifying and exposing differing frames of reference and mental models. In constructing meaning from the participants a broader scope in the assumptions, norms, beliefs, was a prerequisite.

In the spirit of SSM, the facilitation was conducted to trigger of innovation, debate, alternative frames of reference, collaboration, accommodation, engagement, further inquiry, learning and change, the composition of the group was structured to give balance; principals, teachers, students, and administrators. The idea by Cundill *et al.* (2012) that moving towards a shared understanding requires special efforts, insights, and time is true. Without skilled facilitation and effective stakeholder engagement, the emergent outcomes would not be possible. Once more, the challenges of group think, personal biases, and breaking existing social norms would go unchecked.

4.5.3 Stage 3: Comparison Phase

Following the construction of the human activity systems, the next stage was comparison. At this stage, the HAS models were compared with the real world following Checkland's model. HAS comprises the RD and CM which were identified as intellectual models (IM) that were generated to improve the teaching of EL. These IM were systemically done divorced from the current practices in order to come up with idea models for change.

For each purposeful activity model, a chart matrix was formulated. The chart matrix used is shown in section 5.7 in the following chapter. The purpose of the matrix was to link the activity elements of the models implementation questions. The columns of the matrix are as listed below:

1. Does the model exist?
2. Present mechanism
3. Measures of performance
4. Recommendations
5. Comments

As can be noted, SSM first permitted the intellectualising of EL in learning, then subsequently the comparison of the intellectual models with the real world of teaching and learning. The objective of the comparison was to make recommendations to improve the teaching and learning process. As suggested by Reynolds and Holwell (2010), the structured discussion or debate culminated in the generation of transformative action points which will be the subject of discussion of the next section.

4.5.4 Stage 4: Action

Changes in improving the teaching and learning of EL involved looking at the existing structures; the process of teaching and learning; and finally any attitude changes that were deemed fit. The aim of this phase was seeking accommodation between divergent world views (Reynolds and Holwell 2010). The scope of this study was restricted only to recommendation of actions. Implementation and post implementation evaluation are recommended for further studies.

4.6 Ethical considerations

Before embarking on the fieldwork, the first step involved compliance to the ethical considerations. First, the research only commenced after ethical clearance from the Institution and the Ministry of Primary and Secondary Education of Zimbabwe (See Appendix 8, and 9). Second, this study involved students with ages ranging between 15-21years. In Zimbabwe, the legal age of majority is 18 years, this implies that the target population involved working with a vulnerable group of those that were in the minority category. Although there were some who were above the majority age, because they were still under the guardianship of their parents, they were technically categorised in the vulnerable group as well. For this group, letters of authorisation to seek consent were sent. The aims of the research were clearly explained to every participant before consent was sought. Having obtained consent, the research was conducted in compliance with such issues as integrity; confidentiality; participants' informed consent; mitigation of risks of impairment of participants' self-esteem and dignity; transparency in the recruitment process; undue influence of research sponsors; and demonstration of deemed benefits of participation in the research process. Participants were fully informed of the nature, procedures and processes of the research, and it was made clear to them that their participation was voluntary and was not financially rewarded.

In studies involving improving pedagogy, the contributions of students is very valuable. Having obtained permission from the MoPSE, access was obtained from Hilbright Science College management (Appendix 9). Focus groups, which are discussed in the following section were conducted in a child friendly manner, and students were informed that they were at liberty to opt out of the research. These focus groups were done outside the timetabled learning time in order to enhance the independence in presenting issues, and also not to prejudice the learners of their learning time.

4.7 Use of Focus Groups

The population relevant to the study comprised students aged between 15-21 years at Hilbright Science Colleges (three in Harare - Avondale, Eastlea, and Marlborough, one in Mutare), and officials from the Ministry of Primary and Secondary Education (MoPSE). Although the dominant research methodology was Soft Systems Methodology, focus groups were used to inform the chosen methodology.

4.7.1 Sampling Strategy and Group Size

The main objective of the study was to gain insight into improving pedagogy for Entrepreneurial leadership. It was important to obtain these insights from multiple and different worldviews. Heterogeneous groups were the most appropriate for this purpose in order to change these diverse world views. Key participants included Learners, Teachers, School Principals and Ministry officials. Participants were selected keeping in mind that focus groups were different from quantitative surveys. In essence, criterion based strategy based on pre-determined characteristics and rationale was used in choosing the participants of the focus groups. The rationale for the selecting of the key informants mentioned above was that they shared common experiences regarding pedagogy, and the curriculum.

Research suggest that group sizes should range between 5 and 12 (Winlow *et al.* 2013). Group dynamics such as participation, management, data quality, and the richness of the discussions have a correlation with group size. With this in mind, the maximum ceiling of focus groups was set at 12. In this study, different focus groups from different locations were used (see Table 4.4). Table 4.4 shows the stakeholders, their designation, location, and method of selection.

Table 4.4: Schedule of Focus group Workshops

Location	Number of focus groups	Selection Criteria
Marlborough	3	Criterion based
Avondale	2	Criterion based
Eastlea	2	Criterion based
Mutare	2	Criterion based

Source: Author

4.7.2 Focus Group Design

Studies show that the quality of the data is influenced on how the questions used in the discussion are designed and administered. In this study, the discussions were guided by the research aims and objectives as proposed by Bryman and Bell (2015). Questions guiding the research questions were carefully planned and sequenced in order to encourage debate and discussion. Key questions used in the discussions are summarised in Table 4.5.

Table 4.5: Focus Group Guide

Process or Stage	**Topic or Question**	**Focus or Goals of discussion**
Opening and Ice breaking	• Briefing of the research objectives, • laying the ground rules, • organising note taking, • Ensuring that all learners were at liberty to make valuable representations.	Orientation
Main Discussion	Question 1: Why is it so? List the reasons that causes the problem.	Brainstorming and listing of problems focusing on why learners lack EL skills.
	Question 2: How are the challenges related?	Implications and significance of the problem elements.
	Represent them in (a) spray diagram b) Rich picture format as per briefing. After seeing the interrelated of issues what lessons did you learn? Question 3: Do you thinking seeing issues and how they are related is an important skill to be taught to students (Give advantages)	Reflection and learning
	Question 4: How can we can we make entrepreneurship and leadership core skills in teaching and learning. List the possible changes that must be done in order to achieve this entrepreneurial thinking?	Exploring intervention ideas and options.
Closure and Evaluation	• Evaluation of the focus group exercise.	Feedback and vote of thanks.

	• Suggestions for improvements. • Closing remarks	

Source: Author

To overcome the challenges of participation, facilitators were oriented on the techniques which encourage participation. Besides, being Teachers, such skills are very common and expected because of their training in pedagogy. Students were selected from the most keen and capable and those that could both understand the issues at hand and be able to make valuable representations. The focus group sessions lasted for 40 minutes to an hour, and they were conducted at the learners usual venues, which also did not create anxiety or any distress related with change. In order to encourage interaction and engagement, the furniture was arranged in a circular format, demystifying issues related to positional power. Furthermore this encouraged face to face communication of members allowing the secretary to select some of the non-verbal cues that were necessary for group management.

In relation to power issues, as mentioned above, Teachers were used as Facilitators based on their group work management skills. The issue of encouraging students to participate, and to give equitable chances was highly emphasised in the pre-session briefings. Another issue that neutralised the power imbalance was that the idea of Entrepreneurial Leadership was not part of the mainstream subjects and therefore it was rather neutral ground.

4.7.3 Recording, Transcription and Data Analysis

Each focus group assigned a secretary, who was responsible for taking notes of the focus group discussions. An audio recording was done which was later used in data analysis. The data collected from the focus groups was transcribed, and cross checked against the original recordings. All transcribed data and responses from the participants were anonymised in keeping with the ethical requirements. Themes were manually generated, and the transcriptions including the audio recordings aided in the process of triangulation. The final themes were also discussed in a workshop using a knowledge café approach.

4.8 Pretesting

In order to come up with a defensible model, all research instruments were pretested. Each research instrument was firstly discussed with my supervisor, and secondly I did a pilot study on my peers who were on the same cohort. Questions that lacked clarity, and that were long were adjusted accordingly. While it is difficult to pretest focus groups, in order to have robust outcomes, a plan for each focus group meeting was followed. Facilitation of each focus group was done with the conscious critical reflection in mind. Keeping in mind that SSM esteems the emerging issues, debate was encouraged.

4.9 Delimitations/scope

As was outlined in Chapter One, this study took a specific focus of the broader theme of EL. It is indeed undisputed that EL as a discipline is rather broad, and thus the restriction to the chosen field was to give depth. The scope of this study was limited to EL in teaching and learning, more specifically at secondary school set up. Although the application of EL was applied at a secondary school, I assume that it can be applied at Universities and other institutions of learning. I did not place emphasis of the attributes of EL, as in finding out the most ideal for students at high school. My focus was on improving for these EL attributes. As will be noted, the models that were proposed for implementation were not applied and evaluated, this is proposed for further study.

There are various systems thinking methodologies, which are outlined in the literature review section 3.3. It is beyond the scope of this study to critique each methodology. Only justifications for the methodologies used and their limitations are given. If another methodology was applied, the results as presented would have taken a different trajectory.

The research was conducted in Harare and Mutare. The field of study included four institutions of Hilbright Science College (HSC), three are Located in Harare and one is located in Mutare. HSC is a college which specialises in the teaching of science education in Zimbabwe. Each campus is an autonomous unit run by a Principal who reports to the head office headed by the Chief Executive Officer. Major informants, and players in the education sector included representative participants of students (15-21yrs), parents, teachers and administrators were drawn from Hilbright Science College (HSC)'s four centres. Entrepreneurs, Employers and MoPSE representatives were conveniently selected from Harare.

4.10 Limitations

No research is without limitations. A study of a larger sample including institutions from the 10 Provinces of Zimbabwe would have yielded better results, however, this was feasible both financially and in terms of time. Future studies can be done with larger geographical scales. The word system has generally been loosely used. This brings much confusion when it has to have a specific meaning and application as it is regarded by systems practitioners. Many a time I would have to explain the difference of being systemic and systematic in the focus groups. The researcher was self-funded and given the current economic conditions, financial constrains were inevitable. Lastly, I cannot avoid the lens that shaped my world view, experience, and context. I do not doubt that further studies on the same issue can yield totally different results.

4.11 Anonymity and confidentiality

Anonymity is important so as to protect the participant from any negativity or harm that might come as a result of the research (Saunders 2011; Bryman and Bell 2015). It fosters honesty and openness in participants' contributions in the confidence that their views will not be used to the detriment of their person or standing within the communities in which they reside. To this end, the reporting on the research process and participants' contributions will use a system of annotation that protects the identities of participants and contributors. Refer to Appendix 1-4 for requesting letters.

4.12 Chapter summary

The creation and critical evaluation of a uniquely designed application of Systems Thinking research in order to inform my research project, namely Soft Systems Methodology was discussed in this chapter. The purpose of this chapter was to outline the research process and the activities that were critical in gathering the data that

would inform the research process. Soft Systems Methodology is a unique qualitative methodology, and has a processes that slightly differs with other orthodox qualitative techniques. Through the use of focus groups, data was recorded and transcribed. This chapter informs the next chapter which will discusses the application and analysis of the data that was collected in this chapter.

CHAPTER FIVE - APPLICATION OF SSM

5.1 Introduction

This chapter builds on the data collection process as discussed in the previous chapter. The purpose of this chapter is to present the results and findings from the focus group activities, interviews, and observations. As argued in the methodology section, the results are presented in the format of the Soft System Methodology. The format takes a different format from other qualitative research formats. Although it would have been ideal to first discuss the findings, the results are presented and also compared with literature in the same chapter. This has been done to avoid a repetition of the content in critiquing the results. The chapter begins with finding out, the first stage of SSM. The purpose of this stage was to gain a deeper understanding of the problem and furthermore to have a rich representation of the problematic situation. The first workshops were designed to discuss the problem elements, players, and coming up with a rich picture representing the problem situation. After the rich picture, human activity systems comprising of root definitions and conceptual models were constructed. The conceptual models informed comparison stage where the conceptual models were compared with the current practices on the ground. From this comparison, a roadmap was proposed providing the guidelines of how the proposed changes could be implemented. In outlining the proposed changes, this chapter also discusses the Feedback loops of the underlying structures affecting the proposed changes. The chapter concludes with an evaluation of the research approach and research process.

5.2 Preliminary Settings

The purpose of the preliminary session was getting insight into the context, and coming up with the richest possible representation of the problems related to the challenge of EL in learning. Focus groups were conducted in tandem with the research objective of seeking improvement in teaching and learning so as to embrace EL.

First, I met with the top management in order to seek permission and to explain the objective of the study. Another important aspect was the introduction of theoretical framework and SSM, the methodology that would be used. Having obtained permission, and ground rules, I proceeded with the research beginning at one of the Harare campuses situated in Marlborough.

Following the meeting with senior management, the first series focus group workshop were held at Marlborough Campus in Harare on Wednesday, 20 October 2019. Marlborough campus has an enrolment of 64 students,

comprising of forms one to six. The preliminary stages of the first focus group session involved meeting with 3 of the staff members who were going to act as focus group facilitators. The objective was to seek their permission as participants in the focus groups. Having obtained their consent, I proceeded to the next step.

Second, I explained the research problem, objectives, and the research process. I paid particular attention to how they were going to conduct the focus groups, mainly on how the knowledge café exercise would enrich the problem articulation stage. Third, I emphasised the need for democratic groups and active engagement of all the participants. I briefed them of the aspect of systems thinking of embracing multiple views and opinions. Fourth, I explained the questions that would guide the focus groups, and the outcomes of the first exercise.

5.2.1 Forming the groups

After meeting with focus group team leaders, I addressed the chosen participants of 27 students, and six selected staff members, three whom were senior management, and the other three teachers. Table 5.1 summarises the group composition.

Table 5.1: Group composition

	Group 1	**Group 2**	**Group 3**
Breakdown of Participants	2 staff members, 10 students.	2 teachers, 9 students.	2 teachers, 8 students.

Source: Author

Although it is common practice to have smaller groups in order to have adequate participation of all participants, this is normally where the participants have richness and depth. The group size was therefore slightly increased in order to cater for any deficiencies or lack of depth and knowledge in the learners. Also, learners in that category work best in moderate groups, and the nature of their responses are brief and precise. Learners were selected on criterion basis, in consultation with the team of teachers who were anchors of focus groups. The criterion included:

1. Their ability to understand the discussions and make meaningful contributions;
2. Their aptitude, which was not necessarily class performance;
3. The level of studies and gender, as there was need to have balanced groups.

5.2.2 Stage 1: Finding out

Stage 1 rolled out the inquiry process which would in turn inform the other phases. The objective of the first stage was to have a comprehensive overview of the problematic situation relating to EL. The first stage in finding out began with the application of the stream of cultural analysis – Analysis one, two, and three.

5.2.3 Analysis one

Analysis one involved exploring the intervention context, the methodology, clients, problem owners and problem solvers. The purpose of this phase was to have a deeper understanding of the players involved in the problem context. This would inform the different world views of the problem. A preliminary brain storming exercise was done with the participants, and an initial list of those related to the problem, involved, and affected was drawn up. The list included among them: learners, parents, the society, industry, schools, tertiary institutions, and the government. Problem solvers included among others: teachers, school administration, parents, the society, schools, universities, industry and the ministry of primary education (MoPSE) representing the government. Problem owners were the government, policy makers, curriculum developers, teachers, schools principals and everyone linked to the teaching and learning process.

5.2.3 Analysis two

In Analysis two, the roles, norms and values were identified. First, the role holders in entrepreneurial leadership in learning included: the government, MoPSE, tertiary institutions, teachers, school principals, students, parents, industry and employers and tertiary institutions. Second, pertaining to the norms, the MoPSE has oversight over the formulation of the curricula, implementation and administration. It was noted that the Ministry of Higher and Tertiary Education had the oversight of both training teachers and the formulation of the teacher training curriculum. Students are examined by Zimbabwe Schools Examination Council (ZIMSEC) in accordance with the curricula as set by the MoPSE. Third, the values in teaching and learning for teachers were: completion of set objectives of the syllabi, preparation of external exams, preparing exam heroes, achieving the set results target for both individual teachers and the institution. For learners, the values included: certification, passing with good grades, and graduation.

5.2.3 Analysis three

Analysis three looked at the power dynamics affecting the politics in the education system, and the Hilbright Science College case in particular. Nationally, power in teaching and learning is vested with the MoPSE minister. At the institution under investigation, the CEO, has the final say on administrative issues. At each centre, the principal is the centre of power. Decisions are subjected to a management committee comprising the CEO, the finance director, and the three principals. Recommendations of this management committee are presented to the board of directors before being implemented. For academic issues, more specifically, teaching and learning is the purview of the head of academics who reports to the principal at each centre. Generally teachers are rewarded on merit or performance, the chief criteria being results, and syllabi completion. While teachers who achieve will be recognised, in the same vein, teachers who fail are reprimanded or sanctioned.

Analysis one-three constituted the stream of cultural analysis and formed the first part of the finding out phase. Problem owners, actors, roles, norms, values and the issue of power dynamics were discussed. The next section discusses the second part of finding out, and it gives the results of focus group discussions on the second objective: what is the prevailing situation regarding EL in schools, and how are the problem issues linked? Results from the first focus group were followed with a thematic map of the related issues and a rich picture of the situation.

5.3 Summary of Focus group statements

Using the three groups as discussed in section 5.2, the first task of the focus groups were to identify the prevailing challenges regarding Entrepreneurship and leadership in learning. Each group comprised a team leader and a scribe. The team leader was the anchor of the group, who remained when other group members rotated on the first part where the knowledge café exercise was used. The group composition was designed for balance and also to encourage discussion and interaction as indicated in Figure 5.1.

Figure 5.1: Focus Group at one of the Centres

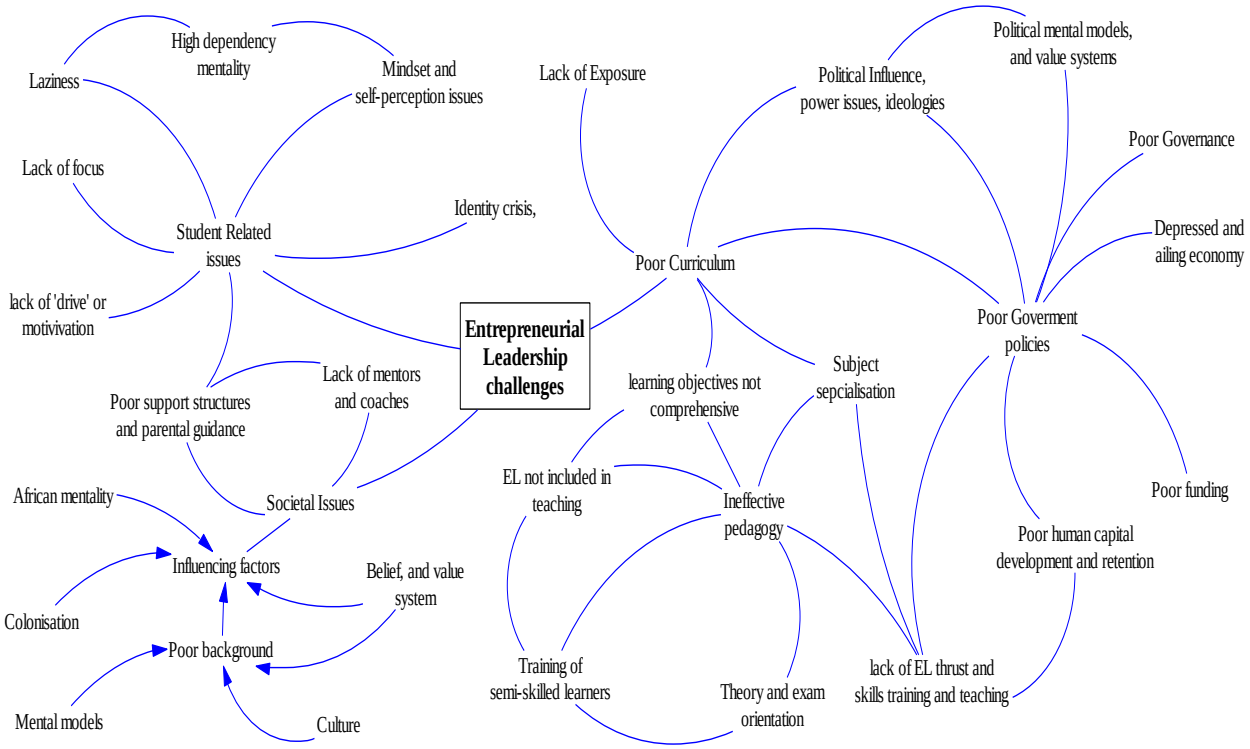
Source: Picture taken by Author

Findings were as follows: This section discusses the results of the first focus group session. This phase was designed mainly to brainstorm the reasons or justifications of the challenges. Using knowledge café, students and other teachers were rotated after 20 minutes of the brainstorming session. The summary of the results for each focus group are summarised below:

5.4 Thematic presentation of results

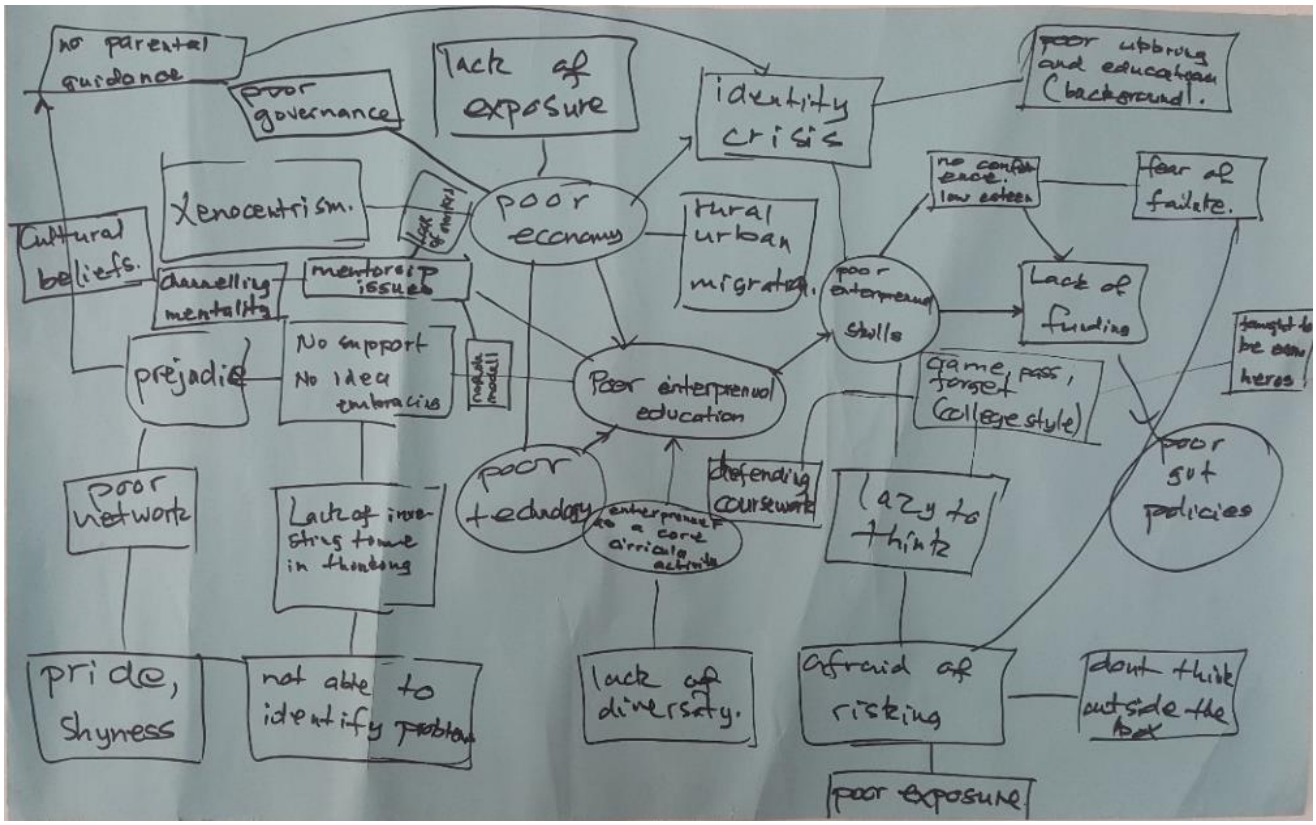
Data collected from the focus groups was analysed applying content analysis. Content analysis helped in the systematic classification of the text into themes. Firstly, after outlining the challenges, each focus group had a preliminary outline of the themes that emerged from their data. The unit of analysis in this preliminary phase was a single word or a group of related words that summed up a theme. After going through the list of all the challenges, a thematic code was assigned for each challenge. No special software was used, the group members agreed through discussion and debate. After the first preliminary session of the focus groups, the practitioner had a further analysis applying again the content analysis. Further reclassification of the themes was informed by the preliminary thematic selection that was done by the focus groups in the other centres. This helped in shaping and consolidating the thematic issues. Figure 5.2 summarises the themes that emerged from the focus groups.

Figure 5.2: Spray Diagram of Emerging themes showing how they are networked



Source: redrawn by Author from Annotated notes of Focus Groups

Figure 5.3: Annotation of emerging themes



Source: Focus group

According to Figure 5.3, four thematic issues emerged: student related challenges; Poor curricular; government and policy related issues; and societal related challenges. The themes are now discussed.

5.4.1 Student related challenges

Student related challenges involved aspects such as their paradigm of self, motivation, background, peer influence, and choices.

5.4.2 Self- Concept

An interesting theme that emerged in all the focus groups and annotated interview scripts were student related issues. One key issue that was common in all focus groups was the issue with self-image and self-perception of the students. One of the participants in focus group 1 (FG1) commented:

"…students had fear of failure and were thus timid to try new things." Focus group 1, Transcript1, p1).

It appeared that this was a common challenge cited in all focus groups. In the second focus group, one participant added an interesting perspective to fear. He said *"…fear may be related to failure, and failure can either be perceived failure, observed failure, or actual failure.*" In my opinion, this was an interesting exhibition of the application of observation and analytical skills by the student. This shaded more light on the fear factor.

Still on fear, one participant raised the point *"….most people are risk averse FG2.*" The fear of loss, either of status, prestige and economic loss were cited as some of the predisposing factors influencing risk taking.

One theme that emerged was lack of self-confidence and low self-esteem in students. Participants' discussions highlighted that an assertive personality was closely linked to entrepreneurial orientation and subsequently entrepreneurial success. As one student commented; "*one cannot be a good leader when they are shy FG3*." It seemed that all groups noted that business start-ups where linked to a good self-image. On the contrary, in focus group number 3, one participant cited that pride was also a constraint to entrepreneurial inclination. She commented "…*some students were not prepared to swallow the humility involved in start-ups.*" FG1. Another student added that *"…lack of grit and resilience contributed to low self-esteem.*"

5.4.3 Lack of motivation or drive

Another point that was raised pertained to motivation. One participant noted "…students were not educated enough to be motivated for entrepreneurship FG1." In another group, one teacher said "…students showed that they lacked sufficient education in entrepreneurship and leadership skills FG3." Another point linked to motivation that created lighter moments in one group was the lack of drive. In describing the point the student said, "… inert laziness in some students was the major cause of lack of creativity and innovation required in entrepreneurial thinking FG2".

5.4.4 Poor background

A point that was enlightening was the issue of personal background and mental models. One participant put it this way "…the African mentality is deeply embedded in our thinking process." (FG2). This idea prompted a lot of discussion in that group. It was interesting to note how the participants' particularly the students linked the aspect of identity crisis with colonisation. Shedding more light to the colonisation issue one participant said,

"… actually people are colonised while still young to believe certain things in spite of the historical colonisation being over, most people's actions were still influenced by this colonial mentality." She highlighted that certain beliefs and cultural influence even prejudice contributed to the low entrepreneurial uptake FG3.

5.4.5 Peer related issues

A theme that sums issues related to self-esteem was peer related influence. One participant noted "…*there was destructive competition among students, and professions*." Expanding that point he said,

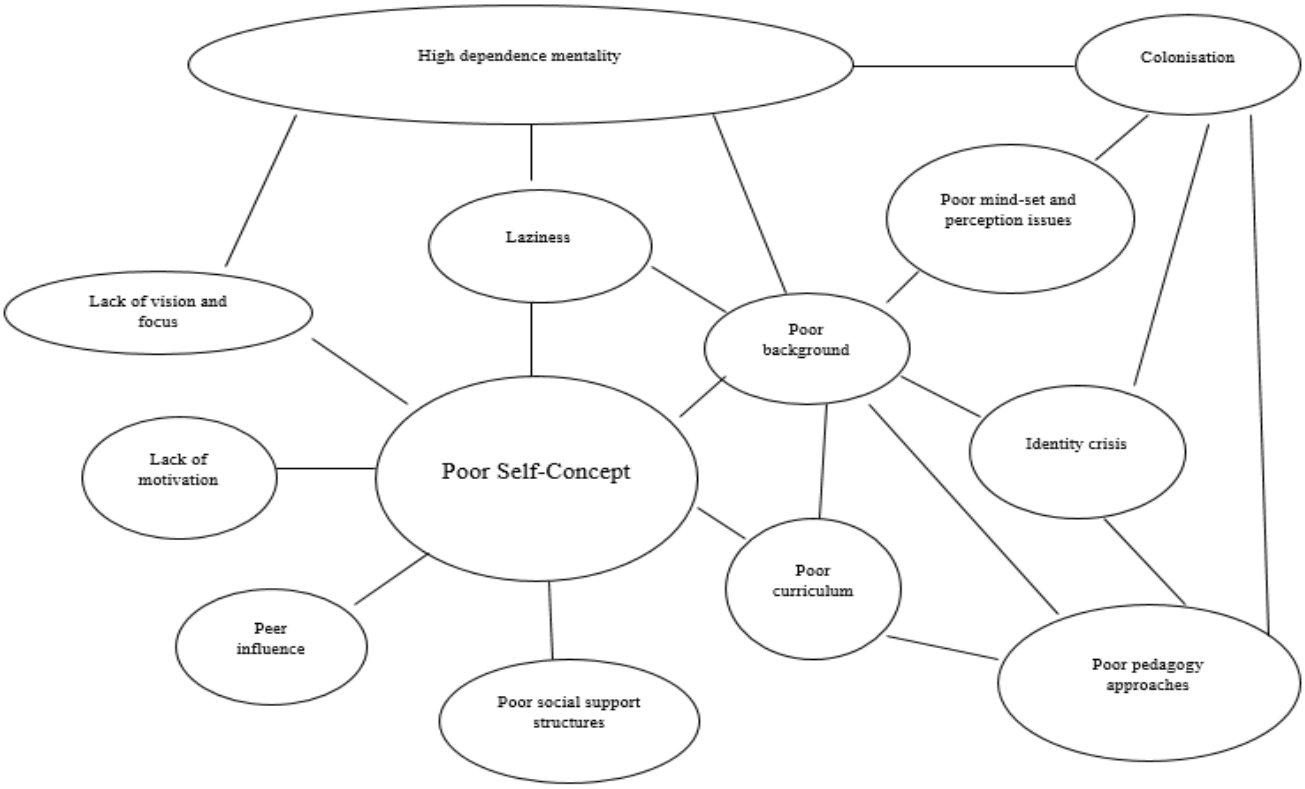
"…students studying science subjects see themselves better than those studying commercials and arts subjects. And in professions, there are certain professions that are perceived as better than others." In another group the same problem was referred to as "negative peer pressure." On a positive side, one student stressed the need for good networking even among students. He cited that "…students lacked socialisation and networking due to a packed timetable." Expounding he said, "…entrepreneurs are people of meetings and networking", and thus the need to simulate meetings at early stages of their learning process.

5.4.6 Choice

Another significant aspect that had influence on entrepreneurship is individual choices. In one focus group the issue of choice, preference and inclinations was raised. One of the participants said, "*Some students were educated to study, work, and live abroad*." Participants were clear on the influence of choice, "*the other reason is poor career path planning*," said one of the participants. Another participant in support also said, "*fore-sight, vision and planning lacked in students.*" There was general consensus that in as much as entrepreneurship may be promoted, the student had the final career path choice.

The student related issues can thus be summarised in Figure 5.4.

Figure 5.4: Student Related Issues



Source: Redrawn from focus group annotation

Having discussed the student related issues, I will now turn to issues relating to poor curriculum.

5.4.7 Poor Curriculum

Curriculum issues in this context covered all issues related to learning. Closely linked to the self-image were teaching related issues. In one group, one participant frankly said, "*The curricula promoted students to work for other people fg1*." This observation was highlighted again by one participant who highlighted "*there is stereo-typing in teaching, certain professions are perceived to be, and esteemed over others.*"

This problem was also cited as emerging from parental pressure, "*Students are forced to take up certain careers that have societal prestige*", said one of the participants. In support, one student said, "*We end up being channelled into professions.*"

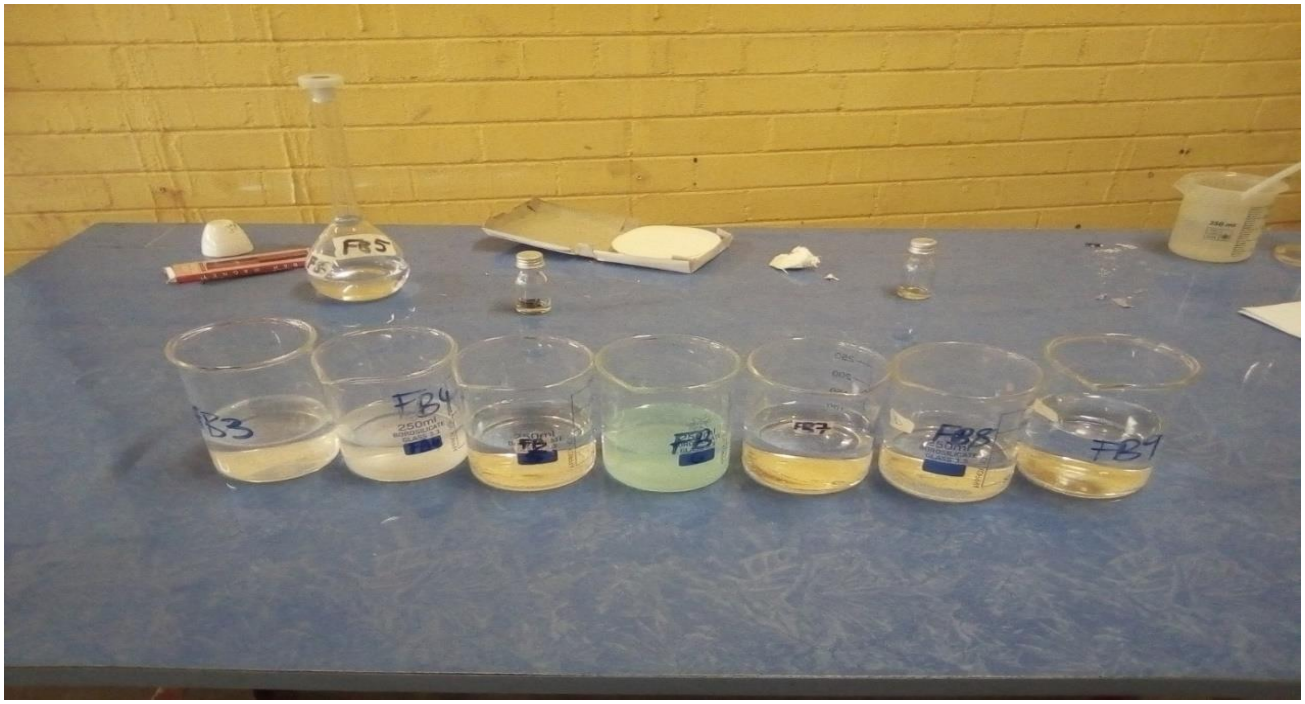
One important point that was raised in one of the focus groups, was subject specialisation. "*There is too much specialised learning, and the subjects are separated and disjointed*," said one of the participants. Another participant supported, "*I thought EL was taught only to students pursuing commercial subjects*."

In a post focus group interview, one respondent said, "*this workshop to me was an eye opener, I think lack of EL thrust in our curricula is another contributor*." The same point was raised differently in one focus group by one who said, "*no one talks about leadership in class, unless discussing hot political issues*."

5.4.8 Teaching and Learning process

With respect to the teaching and learning process, FG1 highlighted that the learning was too theoretical. One senior teacher gave an interesting contribution "*students must be taught for psychomotor skills.*" In explaining his point he highlighted that "*why waste a lot reagents in a titration that will not fit into a psychomotor project*." This comment related to how the science practical experiments were done which had much emphasis in identifying unknown elements in reagents which were later thrown down the sink after the practical experiments. Figure 5.5 shows a set-up of 'unknown' reagents meant for a chemistry titration practical.

Figure 5.5: Picture showing labelling of unknown reagents for a Chemistry Practical

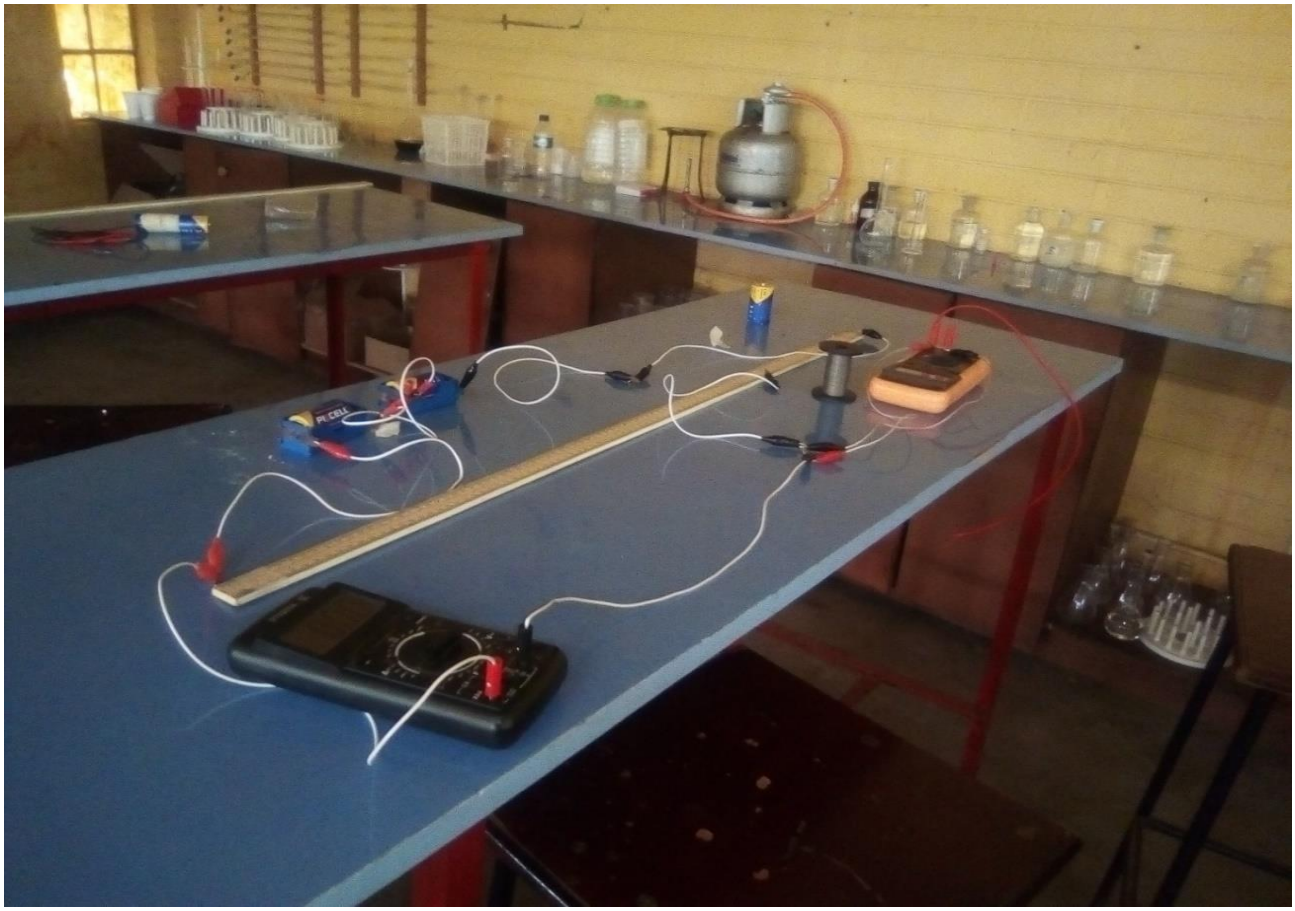


Source: Taken by Author at one of the centres

In further clarifying his point, he said "… *why not test say the concentration of sulphuric acid that fits into a project-based learning of making battery acid, a product that has social relevance and value.*"

Another interesting point that was raised by one student: *"... it seems some of these experiments are an end in themselves. What is the use of measuring the resistance in wires and not apply practically.*" Figure 5.6 shows a set-up of apparatus to measure resistance in wires which the students referred to.

Figure 5.6: Picture showing a practical to test wire resistance



Source: Taken by Author

In support, one of the teachers heighted that "some of the basics taught in the school laboratory are out-dated." Another said *"they are generations behind." Th*ey sighted one experiment on oscillation as shown in Figure 5.7.

Figure 5.7: A practical for Oscillations

Source: Author

5.4.9 Lack of exposure

Regarding curriculum issues, Lack of exposure was another factor which was raised. Given that students were confined to the classes, and no time was allocated for them to interact with the practical world as part of learning. "*There must be collaboration between industry and high schools*" said one of the participants. In support, another participant said, "*Our time tables should be flexible and include slots for such exposure.*"

On the related issue, one responded to an interview said, "*this disconnect with the practical world is one that causes students not to identify problems, let alone to turn them to business models*." Another participant said "*why not teach our students to tackle problems within our context, it will create a culture of providing bankable business models to our children.*"

5.4.10 Government, and policy related issues

Heavy political involvement was cited as a hindrance to entrepreneurship. Although the MoPSE adopted the competence based curricula proposed by the Nziramasanga Commission report of 1999, findings indicate that

very little has been done for its implementation. Regarding the MoPSE CF which was implemented in 2017, one participant said "… *we have no information as to how to implement this curricula*." Another one commented, *"… I am aware of the changes, but how to implement, I do not know*."

Another interesting observation was that while the MoPSE was responsible with the formulation of the curricula in schools, the ministry of tertiary education was the one that was in charge with the formulation of the teachers training courses. It was noted that while the MoPSE had changed its curricula to a competence-based approach, there have been no changes in the curricula in the training of the teachers. "*This presents a serious disconnect between policy and practice*," said one respondent.

Apart from this disconnect, "*there was no wider consultation with industry players, worse still with the teaching fraternity*." Respondents from industry indicated that they were not consulted. One respondent said "*… you are referring to Dokora's thing*." Dokora was the minister of MoPSE responsible for implementing the proposed new curricula.

5.4.11 Societal related issues

Some challenges related to lack of EL up take from people in the society. Emerging themes included: lack of support structures, poor background, perception, culture, and value system.

5.4 12 Lack of support structures

The role of the Family was cited as having significant influence on the child's future career. It was noted that "*some parents looked down upon entrepreneurial skills FG2*." One participant said, "*Students end up with closed minds which focused on the careers that had parental support FG1*." Generally lack of parental guidance was noted. One participant said, "*Parents lacked nurturing skills and abilities as a result natural entrepreneurial talents were not passed to generations FG1.*" Another participant said, "Parents take long to embrace some of these new ideas (FG3)."

5.4.13 Perception

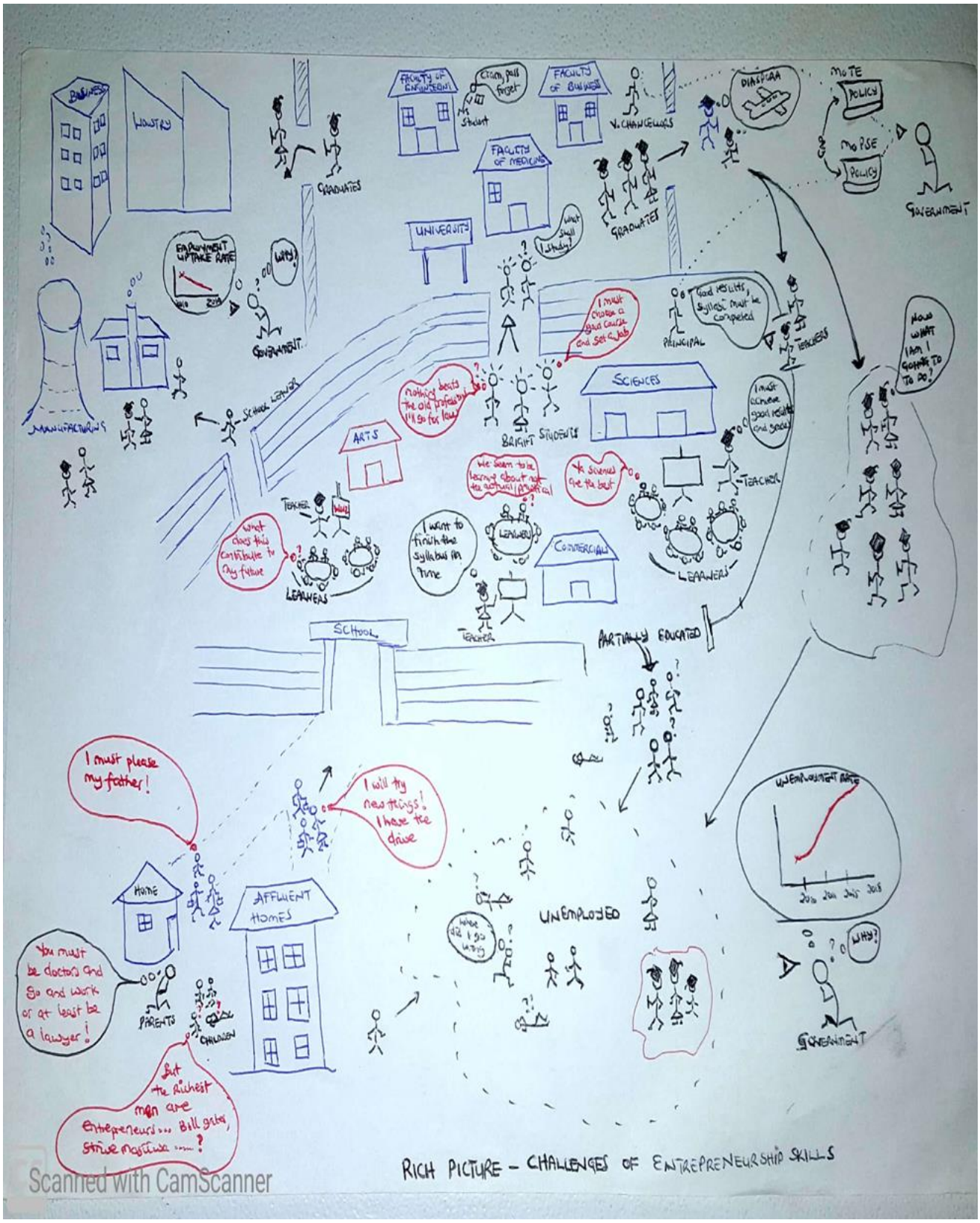
One participant in FG1 said *"… Financiers perceive young people to be playful, and take project from them as jokes.*" Another participant cited "… *lack of capital, and tedious processes including collateral to obtain funding* FG2." Lack of resources FG2.

This section reviewed the thematic issues related to the study, a summary of the themes was provided in Figure 5.2. Equipped with the focus group thematic results, and the spray diagrams, the next thing was the rich picture which is the subject of the next section.

5.5 Rich Picture

The second session of focus group workshops was designed to: come up with a rich picture. First, I gave a RP draft of the problem issues. The purpose of the draft was to introduce a RP by way of an example. Using this draft, the focus groups were tasked to critic and draw their RPs. The final RP summarising all focus group representation is shown in Figure 5.8.

Figure 5.8: Rich Picture presentation of the problematic situation



Source: Focus Group Annotations

5.5.1 Discussion on the Rich Picture - Figure 5.8

Figure 5.8 is the RP representation of the problem contest as seen by the participants who took part in the drawing. According, to Bell, Berg and Morse (2019), generally, RP are by nature difficult to interpret, but it was a useful tool in capturing the thoughts of the participants. In that light, a brief description of Figure 5.8 is provided.

From the bottom left corner, Figure 5.8 represents diversity of backgrounds from which learners come from as represented by the two types of homes. The influence of 'significant others' who have power which shapes career choices is symbolised by the counsel of the parent represented. As learners enter the school, inspired by their diverse intentions, they enter into the school, characterised by specialisation as represented by different subjects and teachers. The diversity of teacher interests and goals is represented with their intentions. In a way, this represents the specialisation that is currently prevailing in most schools. The same specialisation is also prevalent in tertiary education as represented by the different faculties. Learners who graduate from university, are represented by three classes - those who leave for the diaspora, followed by those absorbed into the industry including education, and lastly those who will increase the unemployed pool. The government's oversight role as policy makers and policy impact reviewers is also captured, include their concerns of unemployment and lack of new opportunities.

As posited by Bell, Berg and Morse (2019), generally, there are no general fixed rules of coming up with a rich picture. The reason is that RP are meant to capture the richness, complexity and the diversity in how participants conceptualise the area of concern. In this light, this was the approach which was used in this study. The benefits of the RP were quite immense. First, the participants tacitly performed some 'thematic' analysis in grouping visual metaphors that represented the problem situation. In addition, as argued by Wilson (2001a), in the process of clustering the activities, the participants engaged in some form of content analysis. In a way, the RP became a useful tool in structuring the problem in this thesis and it informed the conceptual model formulation stage of the inquiry process.

One limitation of the RP is that it captures the reality as perceived by those engaged in the drawing. Some aspects and links may be omitted that may be deemed to be crucial. Such omissions may create bias which has been referred to as '*apophenia'* by Bell, Berg and Morse (2019). These oversights may be as a result of either limited experience, or a deliberate decision to concentrate on a specific focus area. In order to avoid this shortcoming, the RP was evaluated by the focus group at the other centres in order to ensure that the links and all the issues were captured.

Three issues emerged from the RP:

1. How can we deal with the mental models that have no entrepreneurial thrust?
2. How can we deal with institutional challenges which include among them subject specialisation?
3. How can the learners be prepared for a life of relevance, even outside 'formal' employment?

5.6 Identifying and defining Human activity systems

This stage involved determining the relevant purposeful systems. The purpose of these activities was to come up with descriptions of the transformations that were needed in the form of root definitions and conceptual models. Firstly, using team leaders who were mainly teachers, a preliminary list of the root definitions was drawn up. I used the post focus group interviews and evaluation to list the possible areas of concentration. Secondly, since SSM was fairly new to the participants, the initial draft of the conceptual models to improve the teaching practice was drafted by the practitioner, but later discussed and annotated with the focus group. Each conceptual model was informed by the thematic data analysis as discussed in section 5.4, and again through reflection from literature review Chapter Two and Three. The Root Definitions and the Human activity systems which will be referred to as conceptual models in this thesis, were thus drawn from theory and from the participants' contributions, and personal reflection.

As the reader will note, results approves or disproves any theoretical framework. It is important to highlight that the Conceptual models which are discussed below are informed by Systems Thinking, in particular Soft Systems Methodology and System Dynamics. These conceptual models form part of the bouquet of the 'instrumentation' that was discussed in section 3.3. In that section, it was argued that a paradigm must have such tools and a methodology to offer solutions which are applicable in diverse contexts. The models discussed in the section Table 5.2 summarises the key Human Activity Systems:

Table 5.2: List of Root Definitions

1	A system to promote entrepreneurial thinking.
2	A system to stimulate knowledge creation.
3	A system to help learners to apply systemic thinking.
4	A system to promote a positive self-concept.
5	A system for parental collaboration and awareness.
6	A system to improve students' exposure to the practical world.
7	A system to embrace transdisciplinary teaching and learning.
8	A system to improve formative and summative assessment.
9	A system to improve human capital development in teacher training institution for EL.

Participants of one centre were actively engaged in the formulation of all the HAS, and the HAS were further analysed in other centres in order to have some form of 'triangulation.' I noted that by the second focus group, some form of saturation was reached. Where the model needed corrections, it was reshaped in order to 'accommodate' the different perspectives and interests in the stakeholders. All the nine HAS are taken in this thesis as devices to encourage debate rather than as prescriptions that should be imposed on the problematic situation. The root definitions (RD) and the conceptual models (CM) are discussed in the following sections.

5.6.1 Human activity system 1: A system to promote entrepreneurial thinking

The model illustrates the intention of having a system to promote entrepreneurial thinking in students. This is in line with the third objective of the study, how best can we teach entrepreneurship? The main purpose (root) served by this system is promotion of entrepreneurial thinking. The assumption of the RD was premised on the lack of entrepreneurial learning that was cited in the findings section of the focus group workshops. Figure 5.9 summarises the proposed activities and how they are interconnected.

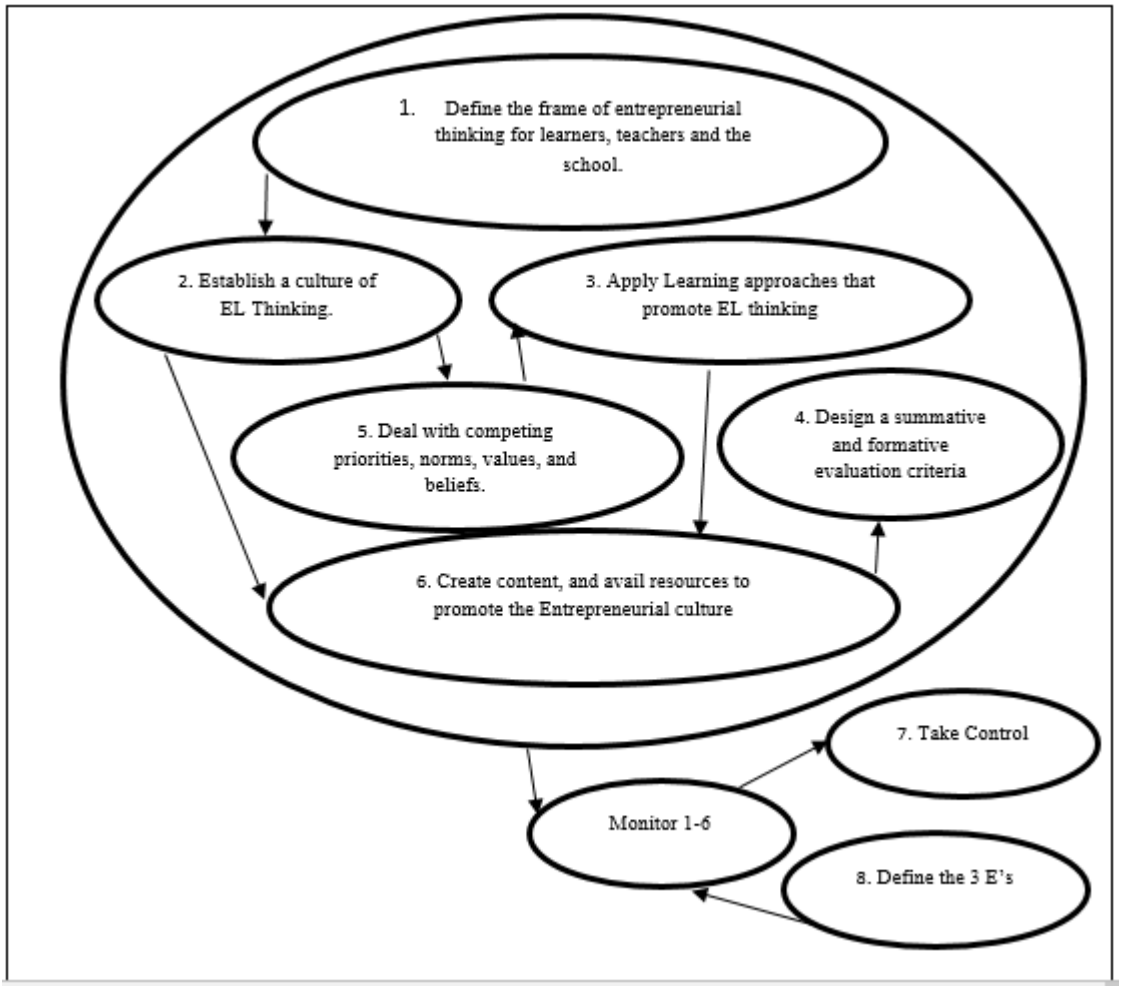
Figure 5.9: Human Activity System 1 - A system run by teachers to promote

Root Definition

A system run by teachers to promote entrepreneurial thinking in learners, in order to help learners to think of entrepreneurially.

C	Students
A	Teachers
T	Promotion of Entrepreneurial thinking and culture.
W	Entrepreneurial thinking will help students unlock creativity and innovation.
O	The school administration
E	Limited resources, expertise, and support structures.

Conceptual Model



Source: Focus Group Annotation

Figure 5.9 describes the root definition, which expresses what the system is, and below it the conceptual model outlines the activities that must be done for the system to be functional. At the core of each CM is the transformation goal (T) and the *Waltenschuung* (W). For this model, entrepreneurial thinking and culture is the intended T, while the W is that entrepreneurial thinking will help the learners to unlock the key attributes which include: innovation, creativity, and enterprising. A culture of enterprise will help them to be flexible, adaptive and relevant.

Figure 5.9 also shows the relevant components and how they are linked. Verbs were used in describing the elements of the system in order to bring clarity on the activities. The following activities which are part of the CM, begins with defining the frame of entrepreneurial thinking for both learners and teachers. This will be a precursor in establishing a culture of entrepreneurial thinking at the school. Related to the school culture, the model proposes the use of learning approaches, and conducive learning environments that foster entrepreneurial thinking. In order for the system to achieve the intended objective, barriers which include among them negative perception of the entrepreneurial notion, competing priorities in the teachers, and poor school cultural practices were supposed to be eliminated or curtailed. Furthermore, the model proposes a summative and formative evaluation criteria that will help evaluate the effectiveness of implementing the recommendations as proposed by this model. The model also include the aspects of monitoring and control, and the assessment criteria anchored on 3 E's of Effectiveness, Efficiency, and Economy.

As mentioned in the literature review, the idea of entrepreneurship are similar to idea of preparing learners was highlighted as a policy agenda in the MoPSE curriculum framework. However, although the agenda for entrepreneurship was mentioned in this framework, as was highlighted in this thesis, that it was omitted in the learning activities. This created a gap between the policy objective and the policy activities. As the reader will note, conceptual models are in essence devices meant to deepen our understanding and learning new ways to improve in problematic situations. I am persuaded that this proposed model represents the system that will set discussion and debate for change.

With respect to the components of the model, the idea of shift from learning about entrepreneurship to multidisciplinary learning 'through' entrepreneurship, and 'for' entrepreneurship is similar to the proposals by Lackéus *et al.* (2016), Kirby (2004), and Raudsaar and Kaseorg (2016). Also, for studies in the Zimbabwean context, there is also a substantial body of literature that advocates for the same (Kanyongo 2005, Nziramasanga 1999).

The idea of an entrepreneurial mentality is broadly in line with those of researchers such as (Gupta, MacMillan and Surie 2004), (Pihie and Bagheri 2010), (Bagheri, Lope Pihie and Krauss 2013) and (Raudsaar and Kaseorg 2016). In these studies synonyms and related terms of entrepreneurial thinking such as entrepreneurial orientation and entrepreneurship perception and intention are used. The proposals of this conceptual model differs from these studies in the following: First, although the choice to focus on EL in high schools was done, the context of my study is unique. The socio-cultural, and the economic conditions that shape the mind-set of learners in Zimbabwe is different from the similar studies in the West and other regions. To cite one related example, most of our learners are influenced by the colonial background characterised by inequalities and prejudices, to the end that the idea of 'emancipation' seems to be common among the learners and policy makers.

Second, improvements in teaching for entrepreneurship using a systems thinking framework is novel to the best of knowledge in Zimbabwe, concentrating on how the softer skills of entrepreneurship, leadership and holistic thinking could be embedded in the teaching process. Third, being immersed in the context of study gave me rich insights than an external would have. Through SSM, participants were actively engaged and the interventions took the form of 'accommodations' from the debate and discussions. This means solutions that meet the needs of the Zimbabwean context emerged. From the multiple players, also emerged interesting and divergent world views. This, coupled with the fact that the participants were immersed in a problem of common interest resulted into rich discussions and findings. To the best of my knowledge very few studies have fused entrepreneurship, leadership, learning and systems thinking especially in high schools in Zimbabwe.

5.6.2 Why has Entrepreneurial Leadership emerged as being so necessary and important?

The fourth objective of this study was to establish the relevance of Entrepreneurial Leadership thinking to Zimbabwe's socio-economic development. What is clear from the global agenda forums and studies is that systemic thinking and an entrepreneurial mind-set are prerequisites of the 21st century learner (OECD 2004; Gillison and Shanks 2013; Gupta et al 2017). According to the OECD report, an entrepreneurial disposition is the vehicle in innovation, creativity, development, and progress. According to Hannon and Gillison (2013), the 21st century is a 'new frontier' which requires independent thinking and problem solving skills. Locally, the recommendations of the Nziramasanga Commission report (1999), and the recent MoPSE competence based CF with a thrust in entrepreneurship, demonstrate clearly the relevance of the thrust of this study.

As proposed by this thesis, given the economic crisis Zimbabwe is currently facing, creating possibilities becomes reasonable. The arguments of Hannon, Gillinson & Shanks (2013) that learners must have flexibility in applying their skills to complex challenges through creating possibilities are therefore plausible. Having a

broader view to reality, and an appreciation of the dynamic complexity of the environment cannot be dismissed. The notion of a ‘systemic’ inquiring mind, coupled with a strong correlation between learning, life and work as argued by this thesis becomes reasonable to assume. If the assumptions of this thesis are true, it becomes reasonable to consider that an enterprising mentality from a systemic paradigm may bring new solutions to unemployment, and poverty, particularly in women and the underprivileged in Africa.

5.6.3 Human Activity System 2: A system to stimulate knowledge creation

The second system proposed in Figure 5.10 relates to a system for transforming the learning process from a knowledge consumption thrust to one of knowledge creation and higher order thinking. At the centre of this model is the idea of linking theory to practice, and the ability to generate experiences that add to the learning curve of the students. The model proposes that a collaborative learning policy should be created. Highlights of the model include: the use of ICT in order to create flexible learning environments that promote sharing and innovation. Such environments will allow students to participate in the creation of their learning spaces and schedules. Another important aspect proposed by the model is the promotion of holistic thinking, and support of multiple perspective in the approach of learning. The model also proposes the establishment of virtual mentors using available media platforms and also mentors that will be within the school. To sum up, the model proposes that the use of problem-based learning approaches, including creation of designs and prototypes to solve contextual challenges will stimulate further creations and new knowledge.

Figure 5.10: Human Activity System 2 - A system to stimulate knowledge creation

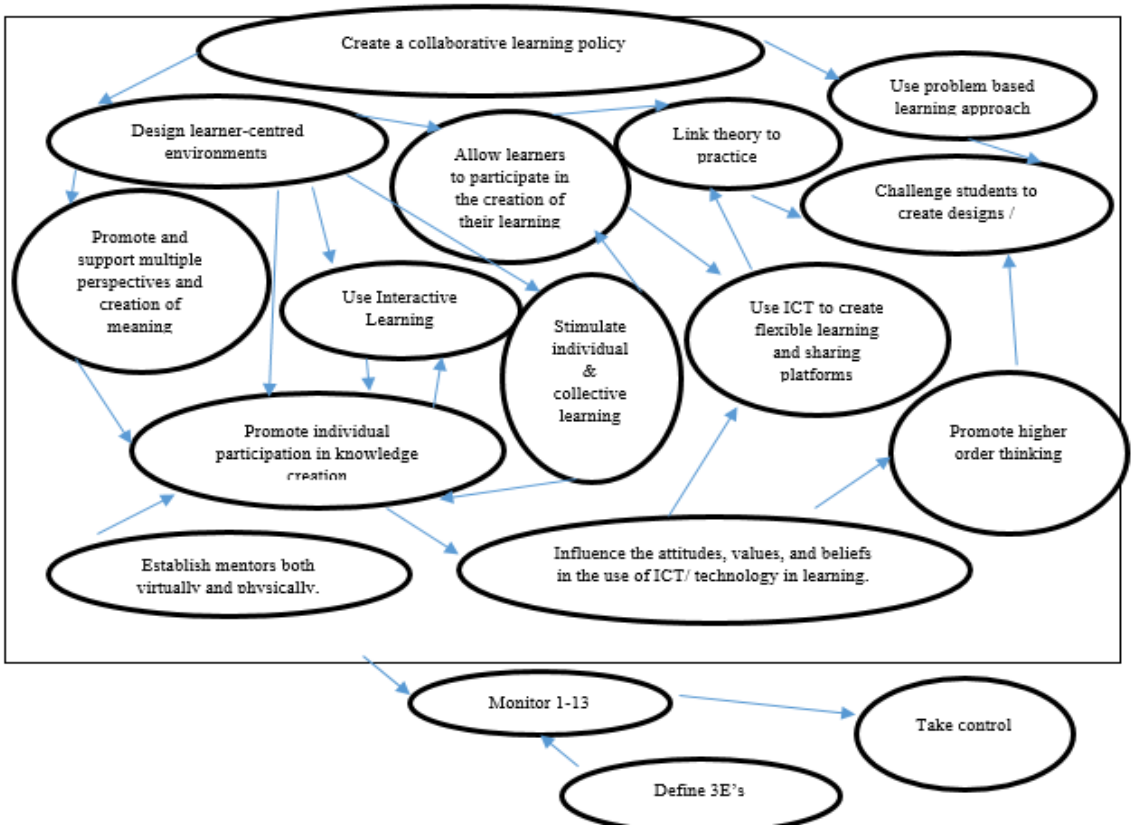
The CM represented by Figure 3.10 is premised on the world view that a culture of knowledge creation and higher order thinking will promote critical attributes of entrepreneurship thinking. This model was premised on the gaps previously discussed in the context chapter. Prior studies have noted the need to transform the teaching

Root Definition

A system owned and managed by teachers and students to shift from a culture of knowledge consumption to knowledge creation.

C	Students
A	Students, Teachers, School principals
T	A shift in teaching approach to promote knowledge creation and higher order thinking.
W	A culture of knowledge creation will enhance creativity and innovation which are critical attributes of an entrepreneurial mind-set.
O	Teachers
E	Constrained timetables, and strict targets for syllabus completion.

Conceptual Model



process to embrace this idea of knowledge creation (Kanyongo 2005). The proposed components in this conceptual model support the observations of Lackéus *et al.* (2016), as discussed in section 3.4. These findings are also echoed in previously reference work of Hannon, Gillinson and Shanks (2013). Regarding the components of the system in the CM, 13 activities are proposed. In order to bring more clarity on the link between these elements, these activities can be further regrouped into four categories using the model by (Abson *et al.* 2017) as described in literature review. Table 5.3 gives this regrouping.

Table 5.3: Regrouping the Activities according to Abson's Model

Level	**Proposed System Activities**
Parameter	• Use problem based learning approaches. • Link theory to practice. • Allow learners to participate in the creation of their own learning. • Challenge learners to create designs and prototypes. • Use ICT to create flexible learning and sharing platform. • Use an assessment criteria based on diversity.
Feedback	• Monitoring and evaluation. • Control.
Design	• Design learner centred environments, and learning approaches. • Embrace multiple perspectives and creation of meaning. • Mainstream higher order thinking skills. • Establish virtual and physical mentors. • Set the assessment criteria based on effectiveness, efficiency, and economy.
Intent or goals.	• Policy mind-set shift • Influencing a paradigm shift in the attitudes, values, and beliefs towards a new pedagogy approach.

Source: Author

Nziramasanga (1999: 249) wrote that "through basic education, pupils are expected to achieve numeracy, literacy, ethical and citizenship knowledge, as well as develop basic scientific and technical skills." It is

interesting to note that the notion of knowledge creation is not clearly spelt out in these underpinning policy objectives for primary school. Furthermore, although the Zimbabwe Curriculum framework mentions knowledge creation aspects such as: learning to learn (p.6); critical thinking and problem solving (p.7); however, like the Nziramasanga report, the curriculum framework did not categorically clarify this aspect of knowledge creation. The contribution of this second CM is that it offers an opportunity to engage in dialogue for improvement in this area. To that end, from this second CM, we can define some questions around this idea:

- Is the concept of knowledge creation in existence in reality?
- What has to be done?
- And how else could it be done?

This means that the culture practices in pedagogy can be challenged as to the structure, procedures, attitudes and mind-set of the teachers. With respect to knowledge creation, the proposed changes as tabulated above are meant to stimulate the idea of creating possibilities and generating solutions through learning as discussed in section 3.3. The next conceptual model which complements this model covers how learners can handle complexity.

5.6.4 Human Activity system 3: A system to help learners to apply systemic thinking principles

This model comes at the backdrop that in Zimbabwe, systems thinking is a totally new phenomena both at secondary education and tertiary education. The transformation (T) at the core of this model is the application of systems thinking principles by learners. Figure 5.11 summarises the root definition and the conceptual model. Figure 5.11 outlines 8 activities constituting the system: These activities are linked in their sequence, and as the reader will note, all changes begin at the deeper level intervention points. In promoting systemic thinking, the model draws from the myriad of beneficial attributes derived from the application of systems thinking which were discussed in section 3.2. The conceptual model as summarised in Figure 5.11 suggests that:

- There must be a shared vision for establishing systems thinking in the stakeholders in learning.
- There should be a buy-in from all centres of influence and authority, followed with a blue print for systems thinking in schools. This implies a change in the curricula and the related pedagogy in order to create the conducive platform. In Zimbabwe there is limited awareness of systems thinking, thus the model proposes a rigorous awareness program, backed by both financial resources and the supporting structures. There is need to draw the attention of all stakeholders to the dynamics of interconnectivity, interrelatedness, feedback loops, causality, complexity and policy resistance issues as discussed in the literature review section.
- The development of a framework for the whole spectrum of learners, beginning even from early childhood development. While this may seem strange, the benefits of contextualising the ideas of cause and effect from childhood are quite great. For example, imagine training a toddler on how their temper has ripple effects say on their siblings, the happiness of the home, how they can affect relations and how people perceive them. Such ‘connected’ thinking if it is mainstreamed in learning will definitely be able to answer some of our issues relating to sustainable use of our depleting resources, and environmental management. The idea of responsible citizenry as enshrined in the MoPSE curriculum framework, will be easily accomplished through this systems thinking framework.
- The creation of assessment or evaluation framework for both the teaching staff and the learners. There must be continuous evaluation of learners which includes the bouquet of formative and summative assessments as proposed in the curriculum framework of MoPSE. This ongoing feedback mechanism must be a source of learning, identifying opportunities, reflection, and further development of contextualised competencies that will fit Zimbabwean demands.

As part of creating social awareness and systems thinking opportunities:

- There must be an infusion of opportunities to learn systems thinking at institutions of higher learning and teacher training institutions in Zimbabwe.
- Infusion of opportunities to apply and use the systems thinking skills in solving social problems. This must be mainstreamed in the learning continuum so that its relevance will not be undermined.
- Reconsideration and restructuring of classroom management techniques and strategies so that learners may be able to learn to think systemically.

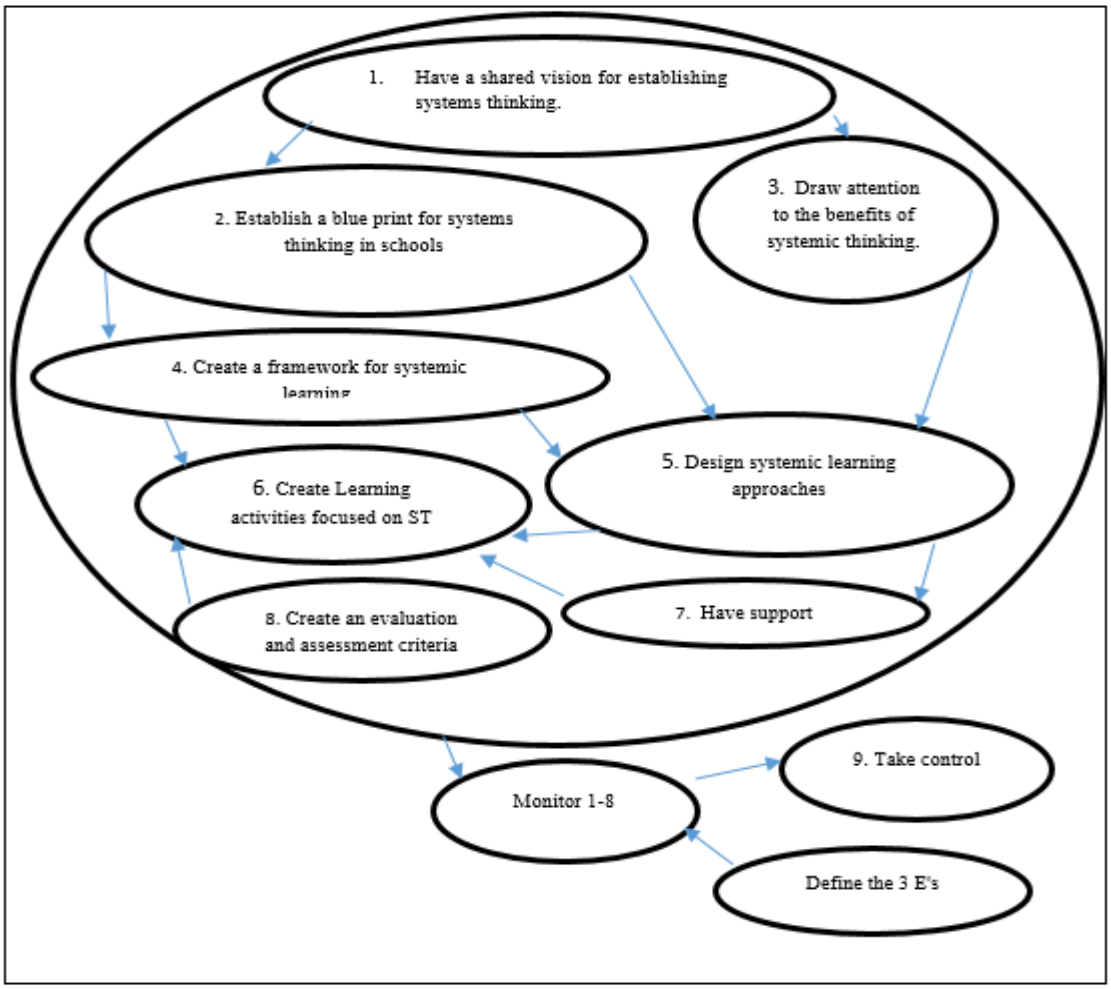
Figure 5.11: HAS 3 - A system to help learners to apply systemic thinking principles

Root Definition

A system run by teachers to help learners to think systemically.

C	Learners
A	Teachers, students, parents, society, government.
T	Seeing the interconnectedness of issues, and feedback thinking.
W	Systems thinking as a critical skill.
O	Learners,
E	Limited knowledge on ST, limited resources, poor policy support.

Conceptual Model



Source: Focus group annotations

The third objective of this study was to explore how systems thinking could inform EL learning. One way that this thesis proposes is to mainstream systems thinking in teaching and learning. Apart from the findings as

suggested in this CM, the benefits of systems thinking as a new way of thinking are discussed in section 3.2. The benefits of students thinking systemically include among others: learners will be able to recognise that the system's structure generates its behaviour and also that the whole is affected by its components. The implications of these findings are that learners should be able to handle complexity, turbulence and highly competitive environments. On the face of it, this would suggest that there must be a transition in pedagogy from a reductionist and simplistic perspective approach to a holistic and systemic perspective.

With reference to systemic thinking, the proposed CM confirms the idea of Davison (2011), that ST is the vehicle for Industry 4.0. The same idea is supported by a growing body of literature see: Calado and Salles (2015); (Cortese 2003; Sweeney and Sterman 2007). There is much work which shows other related benefits to institutions of learning (Peter 1990; Senge 2006; Senge *et al.* 2012). Having discussed the model relating to systemic thinking, I will now move on to discuss the fourth conceptual model.

5.6.5 Human Activity System 4: A System to promote a positive self-concept

Thus far this thesis has argued for three systems: a system to promote entrepreneurial thinking and culture; a system to stimulate knowledge creation, creativity and innovation; and a system to promote and mainstream systemic thinking in learners. As the reader will note, all systems proposed so far, centre on the development of the learner, which is the subject of the fourth conceptual model.

The transformation objective advocated by the fourth model relates to promoting a positive self-image in the learners. The aim being to equip students with the soft skills of self-mastery skills, assertiveness, and improving self-esteem. This conceptual model is premised on three important pillars:

1. The ultimate goal of learning is the development of a competence individual, who is independent, and who is a thinker;
2. This 'thinker' must also be a leader, beginning with personal leadership, then extending to external influence.
3. The idea of a positive self-concept seems to be omitted in practice and 'sacrificed' for the syllabus objectives.

The worldview of this model is thus underpinned on these three points, which states that a positive self-concept is strongly correlated to an enterprising learner. Figure 5.12 summarises the important tasks of the system, and how they are interconnected. Apart from showing the interconnected activities, the CM outlines the relevant

tasks to be done. To begin, the inclusion of the self-concept in the policy agendas of both the ministry and schools. Secondly, the learning approaches must be learner-friendly, aimed at fostering a positive sense of self-worthiness. The model proposes a change in perception issues, stereotyping, and negative self-evaluation. Thirdly, the model proposes relationship building skills like communication, leadership, and conflict resolution just to mention a few. The model proposes a positive self-evaluation criteria, that results in appreciation of individual uniqueness and also valuing personal diversity and celebrating differences. Figure 5.12 summaries both the Rd and the CM.

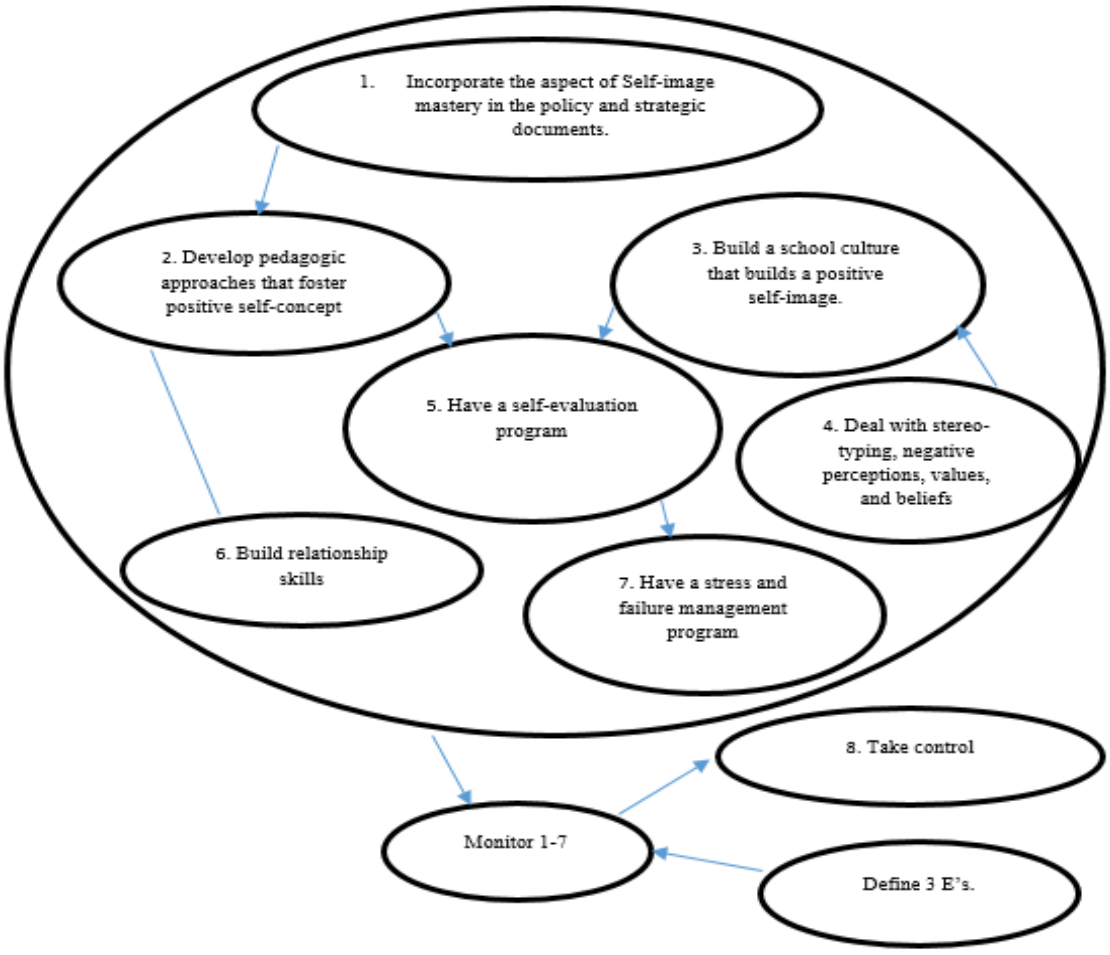
Figure 5.12: Human Activity System 4: A System to promote a positive self-concept.

Root Definition

A system run by teachers to improve self- esteem, self-mastery, and assertiveness in students in order to promote a positive self-concept in students.

C	Students
A	Teachers, Students,
T	An improvement in self-esteem, self-mastery, and assertiveness.
W	A positive self-concept has a strong correlation with EL.
O	Teachers.
E	Little attention given to affective and soft skills.

Conceptual Model



Source: Focus Group Annotations

Another key point to emerge from the results was that a poor self-concept had negative influence on learning of EL. The way in which the focus group participants linked a 'high dependence mentality' to the lack of entrepreneurial drive and other related issues was informative (Figure 5.12). Another point often overlooked which was highlighted by the participants was laziness. According to the participants, lazy people seem to lack creativity and innovation. This observation appears to support the argument that providers of tuition have to deal with this passive mentality. One participant noted that this mentality seemed to be so common among Africans that it seemed to be synonymous with the 'African Mentality.' To that end, a system to improve self-esteem and assertiveness is proposed in this thesis.

With reference to the components proposed in this fourth model:

- As discussed in the literature review, specifically the ideas of Cabrera (2006) and Meadows and Wright (2008) of balanced thinking, an emphasis on the soft aspects which are proposed will help in achieving this objective.
- Previous studies Kanyongo (2005), Nherera (2000), and Napier (2010) have highlighted the challenges and impacts of the curriculum on the learner in general. However, the proposal in the conceptual model seeks to provide specific activities that are focused on improving the learners' self-concept. In addition, this model proposes the aspect of conceptualising of failure as an important aspect of the learning curve together with management of stresses related to failure. This is in line with the notion of balanced thinking which was discussed in the above point.
- While the notion of change in classroom management seems to be over emphasised in previous models (models 1-3), it is interesting to note that such issues as stereotyping especially the 'under performers' has been found to have negative impact on the emotional intelligence of the learners. These proposals broadly supports the work of other studies in this area. For example, the model by Darling-Hammond *et al.* (2020) which supports positive ways of helping learners to overcome adversity comes in handy. This means helping educators in dealing with differences in learners; addressing their learning approaches to provide a safe haven which is both supportive and emotionally encouraging.

5.6.6 HAS 5: Parental collaboration and awareness

Another significant aspect which was proposed in improving for EL leadership was parental involvement and collaboration. The context in which this conceptual model is given is as follows:

- There seems to be very little or rather limited parental involvement in the learning process. To highlight, at HSC, parents are involved in the learning of their children in financing; once a year on consultation day; and 'passively' receiving end of term assessments reports. Passive in the sense that after the report, there is no collaborative engagement between the parent, teacher, and the learner to explore possibilities of improvement.
- My observations as a principal for the past years in education: teachers tend to resent consultation meetings, and because they are too spaced, it will be too brief to give comprehensive feedback and also to deal with the unique demands of each learner in depth.

In this system, we suggest that improving parental collaboration in the teaching and learning process is critical for EL competencies in learners which is summarised in Figure 5.13. This world view is premised on the fact the learning is socially entrenched, and the parent is a critical player in the ecology of learning. The starting point of the model is on creating an awareness and developing of entrepreneurship as an option for students. This is meant to create a buy-in of the parents in the collaborative activities that are proposed by the system. Given the parental challenges highlighted in section 5.4, the model proposes a program of dealing with negative perceptions and longstanding cultural biases. In garnering the support, the roles of parents should be clearly outlined. In like manner, the shared responsibilities and the expectations too. The model proposes formation of activities that are co-created by both the school and parents. Figure 5.13 summarises the RD and the conceptual model.

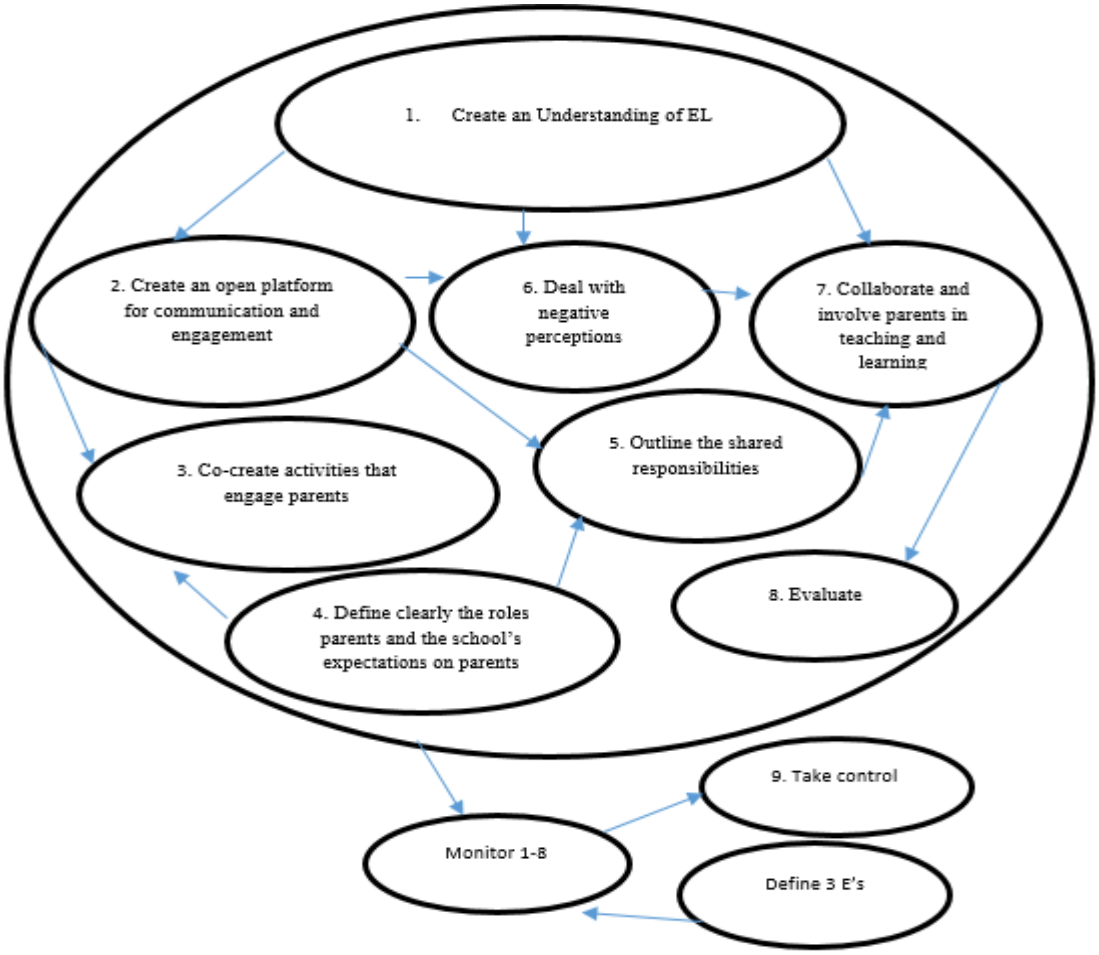
Figure 5.13: HAS 5: Parental collaboration and awareness

Root Definition

A system run by the school to create awareness and garner parental support for EL teaching in schools, so as to improve parental collaboration.

C	Parents, learners
A	School principals, teachers,
T	Create awareness and garner parental support for EL teaching in schools.
W	Parental support and collaboration is critical for EL learning.
O	Parents, teachers and school administrators.
E	Little parental involvement in learning, poor communication systems, divergent expectations between parents and the school.

Conceptual Model



Source: Focus Group Annotations

Although this model reflects much in a way to the work of LaRocque, Kleiman and Darling (2011), this model differs in that it is rather forward looking, and also in this thesis, it is proposed as part of a bouquet of package proposed under a systems approach. This was motivated by the participants who highlighted that there was need for a social support system, including parental guidance in order to foster effective learning of EL. The notion of collaboration is similar to the work of Hill, Witherspoon and Bartz (2018) and Kocayörük (2016). A common thread in these studies is that entrepreneurial learning is socially embedded and can be learned and developed through experience, reflection and observation. The proposed model corroborates the idea that learners need to experience various roles and tasks in entrepreneurial endeavours (Gupta, MacMillan and Surie 2004; Kempster and Cope 2010). In short, the findings align in every respect with the thinking that reality is not theoretical and abstract, but rather practical and socially constructed.

The proposed CM has its downside:

- Not all parents may buy-in the idea, notwithstanding previous findings which have proved that most parents are interested in the affairs of their children. As LaRocque, Kleiman and Darling (2011) explains parental involvement may be influenced by comfort levels, knowledge, parental self-confidence, motivation and assertiveness.
- The attitudes of the teachers and their expertise in mainstreaming parental involvement will have a big impact on the success of this model.

On the other side, if barriers stated above, and those discussed in the literature review section are dealt with, the synergistic potential from this collaboration has far reaching benefits. Some of the benefits that can be derived from this collaboration include:

- Creation of contextualised school cultures that meet the specific needs of the learners and the expectations of the parents.
- For Zimbabwe, this collaboration can provide a base for new learning, and the transmission and development of indigenous knowledge.
- Synergies which include mentorship, role modelling, counselling and exposure to practical reality are also envisioned.
- Lastly, once a culture of parental involvement is embraced, it is mostly likely to have a positive reinforcing loop, thus creating more future synergies.

In summary, this model raises critical questions regarding parental involvement, significantly, what the school needs to do, and address in forging ahead in a complex and dynamic environment.

5.6.7 HAS 6: Improving learners' exposure to the practical world

The previous model discussed the role of collaboration and parental involvement in learning. In summary, it has been shown that the network and ecology of the learning process is rather huge that educators need to look beyond the school walls for comprehensive teaching. In this section, a CM with the underlying transformation of improving learners' exposure to the practical world and reality is discussed.

The system elements for improving learners' exposure included, the creation of a value system that underscores exposure. The model proposes the adoption of a flexible learner-centred approach, and inclusion of exposure time in the planning of time tables. Another important aspect that the model suggests is the engagement of industry players and the use of problem-based learning approaches. The effectiveness of this model will be evaluated on the basis of offering practical information to learners and an opportunity to apply their skills. Figure 5.14 presents this HAS.

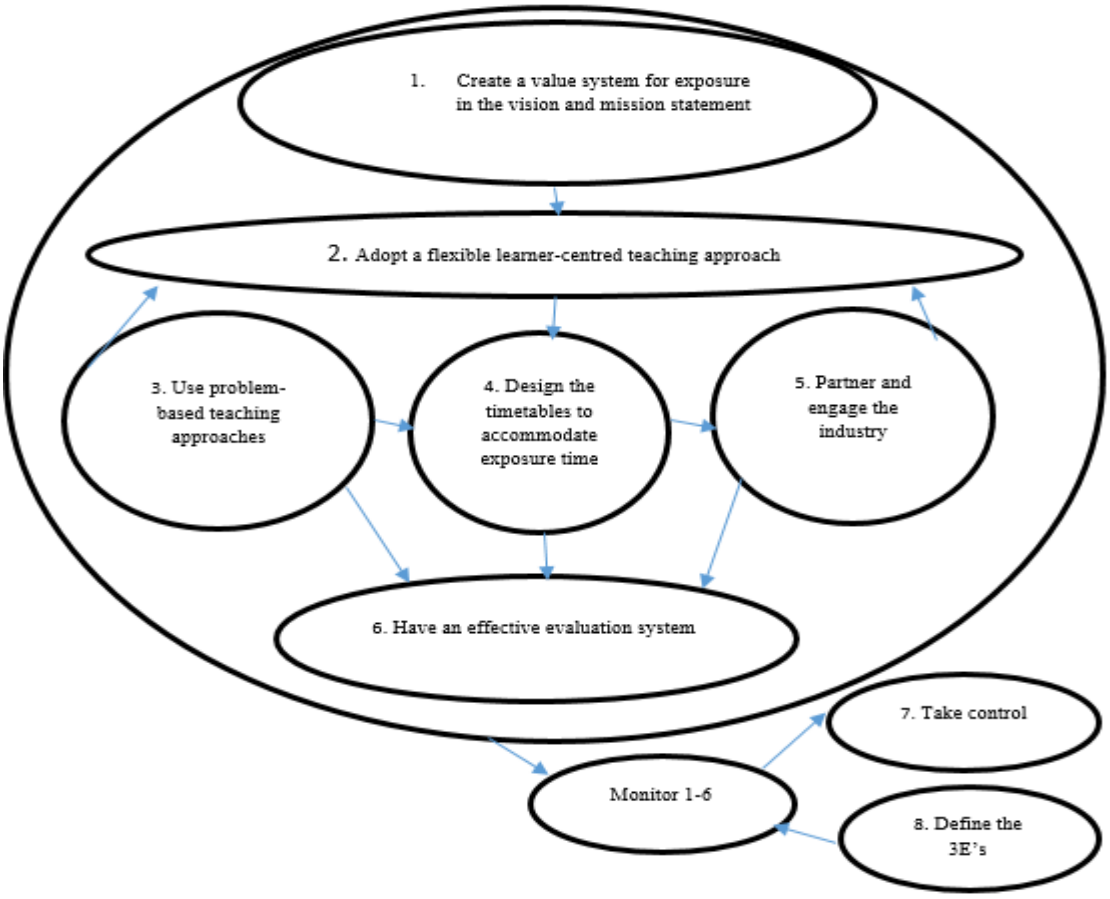
Figure 5.14: HAS 6: Improving learners' exposure to the practical world

Root Definition

A system owned and managed by the teachers to have a learner-centred teaching approach in order to improve students' exposure to the practical world.

C	Learners
A	Principals, teachers, parents
T	Helping students to have practical exposure
W	Student involvement in practice will enhance their learning.
O	Teachers, parents, the school administration.
E	Packed timetables, exam oriented and summative assessments, limited involvement of industry in learning, resistance to change.

Conceptual Model



Source: Focus Group Annotations

This model draws from effective learning approaches discussed in Chapter Three. To emphasise, the results seem to advocate for learning approaches that promote engagement and that are practical. The framework used in this research provides tools for engagement with reality. One such example is simulation. The implications of adopting such a learning tool is that learners will participate in practical real life experiences. In fact, their conceptualisation of reality will not be abstract, but rather practical. This proposal seems to provide insights to challenges in the education system of Zimbabwe as discussed in Chapter Two.

5.6.8 HAS 7: Promoting transdisciplinary learning

Another important component of future oriented education is transdisciplinary learning. The aim of this system is to promote an attitude where students work in teams coming from different backgrounds and different levels of learning to come up with new modes of learning. This will involve teachers also adopting transdisciplinary approaches in their teaching methods. The model proposes a collective approach to problems and learning with the full realisation of the differences of disciplines, perspectives and levels of learning.

The system components include: First, a framework for transdisciplinary learning should be established. This involves outlining the transdisciplinary parameters and expectations. Second, the system advocates for a platform and learning environments that integrate technology, subjects, students, and teachers from different disciplines. In bringing the students together the model seeks to help students in seeing things holistically, again through different lenses. Furthermore, students will be able to make connections across subjects and even with reality. Moreover, learners will learn to collaborate appreciating their differences and this will promote an "international" mindedness in learners. Figure 5.15 shows the important aspects of this model.

Figure 5.15: HAS 7 - Promoting transdisciplinary learning.

Root Definition

A system run the school and managed by teachers to promote transdisciplinary in the practice of teaching.

C	Learners
A	Teachers, principals
T	Embracing transdisciplinary in teaching process.
W	Collaborative learning, and approaches enhances perception.
O	Teachers, school administrators.
E	Discrete and specialised approach to teaching, very little collaboration amongst teachers and students.

Conceptual Model

Source: Focus Group Annotations

In advocating for transdisciplinary learning, this research recognises that single subject specialisation has contributed to poor Entrepreneurial skills. More importantly, the results confirmed that with subject specialisation learners missed the important connections and benefits of interdisciplinary learning. This thesis proposes a shift to transdisciplinary learning through two distinct pillars of entrepreneurship and systemic thinking. Four key points stand out in this model with respect to the Zimbabwean scenario:

- First, a platform where transdisciplinary learning and collaboration will be feasible is proposed.
- Second, ICT platforms should be exploited in integrating both teachers and learners.
- Third, there must be transdisciplinary mentors and champions that will help to smoothen the transition to the TD learning approach.
- Finally, the idea of establishment of an assessment and evaluation criteria for the proposed TD is proffered.

5.6.9 HAS 8: Improving formative and summative evaluation

The model seeks to transform the assessment process in order adopt a holistic evaluation. As highlighted in the findings, the skew towards knowledge acquired in the tests was highlighted. The model suggests the establishment of key assessment areas that include both formative and summative components. It also advocates for assessment of other skills as are demanded by the 21st century challenges. These include: critical thinking skills, ICT, decision making skills, and the practical application of knowledge in real life. Figure 5.16 sums up the model.

Figure 5.16: HAS 8 - Improving formative and summative evaluation

Root Definition

A system owned the government and managed by schools and teachers to improve summative and formative evaluation.

C	Learners
A	Government, Teachers, principals
T	Assessment criteria
W	Soft skills and application must be assessed
O	Teachers, school administrators.
E	Mainly summative assessments, skewed towards theory and core subject objectives, limited use of ICT and needs assessments.

Conceptual Model

Source: Focus group Annotations

5.6.10 HAS 9: Improving human capacity development in teacher training institutions

Having discussed eight CM in the previous sections, we now turn to the last proposed system. In this human development capacity system, the model seeks to transform the teacher training process in order to infuse the aspects of entrepreneurship in teaching and learning. The model proposes a revision of government policies and the teacher training curricular in order to promote the EL aspect. It may not be able to recall all teachers for retraining, but a re-orientation via the use of ICT are proposed. Resistance to change is anticipated, therefore, the model proposes a program which deals with these barriers. Over and above, the provision of leadership, guidance, support structures and financial resources are required.

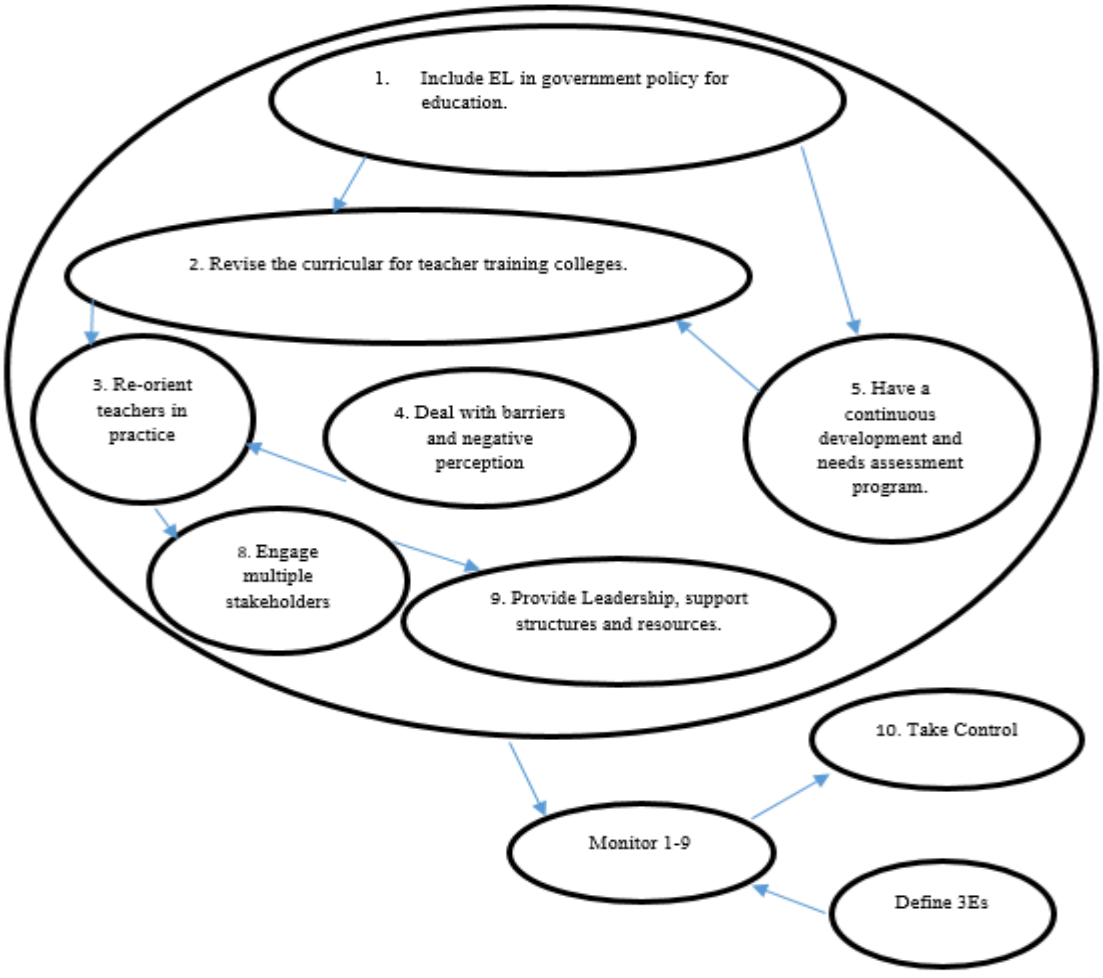
Figure 5.17: HAS 9 - Improving human capacity development in teacher training institutions

Root Definition

A system run by the government to improve human capital development in teacher training institutions to embrace EL in teaching.

C	Teachers, Learners.
A	Government, lectures,
T	EL capacitation
W	A deeper understanding of the relevance of EL will fused down to pedagogy.
O	Ministry of Primary and secondary education.
E	Entrepreneurship taught as a specialised subject, limited needs assessments and continuous professional development in teachers.

Conceptual Model



Source: Focus Group Annotations

5.7 Comparison phase

This stage was designed to compare the main activities in the HAS with the real world, policy, and the process of teaching and learning. The comparison was between the area of concern and the relevant formulated systems. Each activity proposed in the model was evaluated. The activities proposed have been classified into two levels: level one - the major system objective, level two - the sub system activities relevant in sustaining the major system. In this thesis, comparison was only restricted to level one activities. While a full comparison would have been the most ideal, the chosen level of activities tested the major systems that would start inquiry into improvement in the teaching process. The comparison of the major activities are summarised in Table 5.10.

Table 5.4 comprises six columns. The first column is a list of the activities that were outlined in the conceptual models as relevant in achieving each conceptual model. The second column provides information on whether the activity exists or not. The third column, is an inquiry as to whether the mechanism was in existence. The fourth column outlines the measures of performance. Recommendations and comments are outlined in columns five and six respectively.

Table 5.4: Comparing the HAS in the real world of teaching and learning

Activity	Exist or Not	Present Mechanism	Measure of Performance	Recommendations	Comments
1. A clear vision and policy for teaching for EL	no	Current policy is competence based, only entrepreneurship has to be taught as a subject.	A clear policy.	Policy change to adopt and mainstreaming EL in teaching.	
2. Collaborate with parents and industry,	no	Contact with parents limited to academic consultation days. No involvement of industry.	Engagement resulting in student attachments, and parental mentorship.	Have a clear policy for collaboration, and actively engage both parents and industry.	This is possible, there are provisions in government policy.
3. Give students adequate exposure	no	All learning theory-based and ending in the classroom.	Allocated time for student exposure.	Allocate time, and structure the teaching methods to accommodate exposure.	None.
4. Develop teaching staff in ST and EL	no	ST is a new phenomenon, and entrepreneurship is taught as a special area in	A robust staff development policy and program	1. Realign the higher and tertiary education curricula with MoPSE.	Resistance may be expected, and various motivation tools used be

		teachers colleges and universities		2. Mainstream EL in teacher colleges. 3. Adopt a continuous needs assessment program and a continuous staff development program. 4. Adopt transdisciplinary teaching.	adopted as incentives.
5. Improve the assessment criteria to embrace EL	no	Summative assessment only targeting at testing syllabi objectives.	A comprehensive assessment criteria.	Adopt a thrust to assess soft skills to complement the content based assessment.	feasible
6. Provide resources and support structures	partially	Financial resources are limited, and support structures that support the academic system can be reoriented	financial budget for EL, and support structures	Provide financial resources, and reorient the current management structures for EL thrust.	Resources may remain a major constraint given the economic crisis.
7. Apply transdisciplinary learning approaches	no	Subject based teaching, no collaboration among teachers of different subjects.	TD framework, and approach.	Use ICT to create platforms, and create time in the master timetable for TD activities and evaluation.	Teachers can allocate both time to this objective.
8. Mainstream Systems thinking.	no	No knowledge on ST	ST competencies	Train staff and management on ST. Provide literature and other soft resources on ST.	An awareness of the ST and its relevance needed.

Source: Author

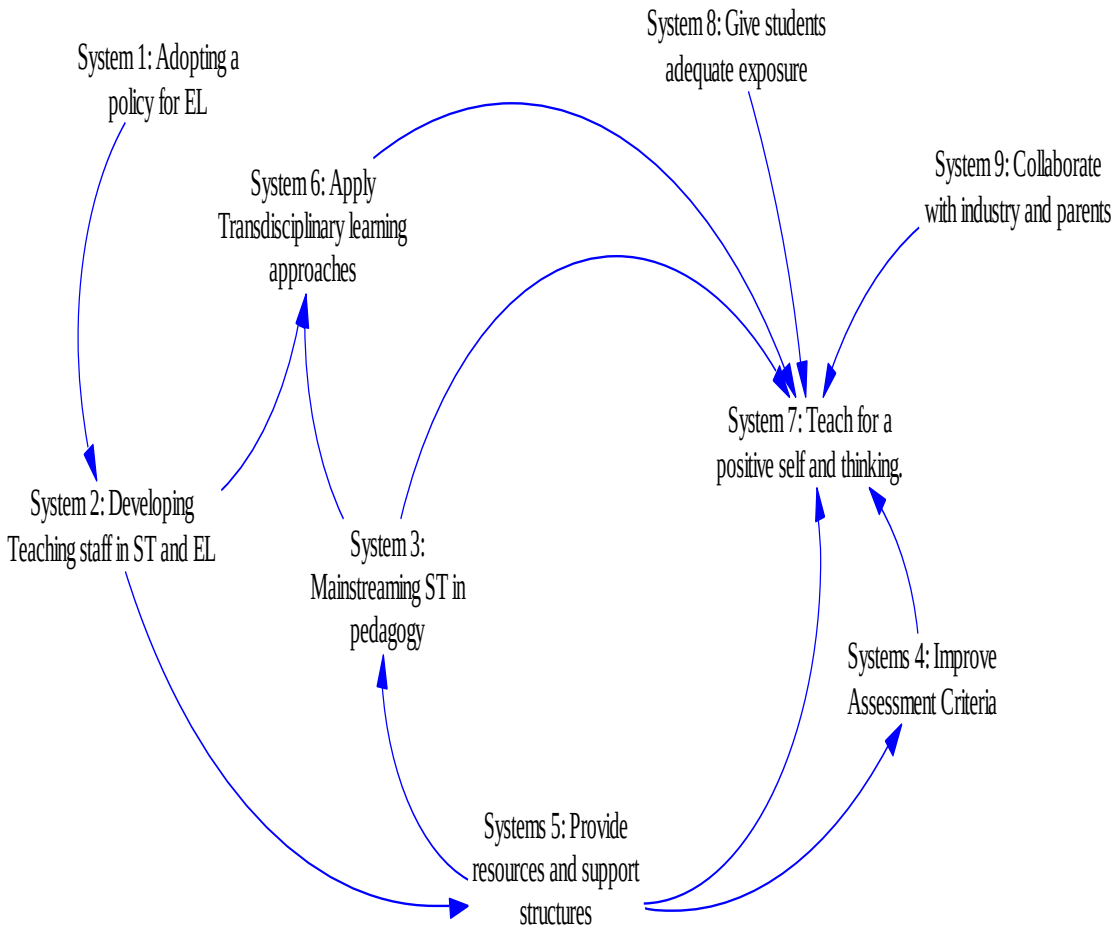
5.8 Summing up all the models into one model

Having discussed the models individually, in this section I will consolidate them into a single model, providing a roadmap on how this model can be implemented. This study set out with the aim of enhancing entrepreneurial leadership in teaching and learning. In particular, the fifth objective of this study was to explore the strategies and mechanisms on how Entrepreneurship Leadership can be embraced as a core competency in learning. This objective was achieved through the use of systems theories in particular Soft System Methodology (SSM) and System Dynamics (SD). In SSM, complex systems are studied through the construction of analytical models. According to (Wilson 2001b), these conceptual models are *not* descriptions of the real world they *are intellectual* descriptions of ways of thinking about the real world. The purpose is to develop an understanding of a situation and its system's constituents, boundaries, connections, interactions and dynamics.

Through the SSM process, nine qualitative models were created: *promoting entrepreneurial thinking, helping learners to think systemically, improving on self-image and self-mastery, parental awareness and collaboration, increasing students' exposure to the practical world, embracing transdisciplinary teaching and learning, psychomotor based teaching, testing and evaluation, human capital development in teacher training institution for EL, improving the curricula for EL, collaborative support structures.* Each model was premised on a particular worldview and each conceptual model aimed to represent a transformation processes including the relationships and influences between the interacting elements.

Figure 5.18 summarises these conceptual models into a single model.

Figure 5.18: Consolidating the nine Human Activity Systems (HAS) into one model



Source: Author

Thus far this thesis has argued for an improvement in teaching learning in order embrace the idea of systemic entrepreneurial leadership in pedagogy. Nine Human Activity Systems, which have been constantly referred to as 'conceptual models' were constructed. These models are diagnostic tools that are used in the inquiry process to create the necessary debate which will stimulate improvement. So far as highlighted in Table 5.4, it has been shown that several areas need improvement. Having discussed the individual models as summarised in Figure 5.18, I now turn to the implementation roadmap.

5.9 Roadmap for change and improvements

In achieving the desired change that is proposed in this thesis, there are several considerations which must be emphasised.

- First, reconceptualise the dynamics of the landscape

This thesis has argued that the world is volatile, uncertain, complex and ambiguous (VUCA), also Industry 4.0 and developments in the ICT are bringing unprecedented redefinition of traditional practices. I have demonstrated that we are in an era of the 'new normal' characterised by an appreciation that change is the normal. To that end, a systems thinking paradigm has been proposed (section 3.2) as the new way of seeing the world.

- Second, restructure the learning culture

As argued in the literature review, from a systems lens, learners who appreciate multiple perspectives, transdisciplinary learning, collaboration, and holistic thinking will obviously make new connections and meaning. It has been argued that where students apply their learning from a multi-dimensional perspective, both theoretically and practically, their perception and judgement is improved. As argued by Lombardi (2007), if learning is intertwined with judgement and exploration, then authentic learning emerges. Systemic thinking moves away from a 'single correct answer' mentality to multiple interpretations and outcomes which is congruent with complexity thinking. To that end, this thesis proposes that learners should be given a platform to stretch their minds, appreciate diverse competing outcomes and diverse meaning and interpretations.

- Learners must embrace emergent thinking. Emergent thinking in learning is understood more in terms of ongoing renegotiations of the perceived boundary between personal knowing and collective knowledge. Emergent thinking in pedagogy, challenges us to think about education in terms of complex organizations that are 'vuca' whose volatility arise from of the dynamics interactions of autonomous, somewhat randomly behaving elements. Emergent thinking is somewhat antithetical to pedagogy approaches that are predictive and hierarchical in nature. In Chapter Three, I highlighted that systems thinkers perceive problems and boundaries differently. From a systems perspective; problems are ill-defined, boundaries are undefined and open, and the problem elements are interconnected. This study therefore proposes a thinking that is echoed by systems thinkers that learners must be able to seek for connections. They must be able to make new meaning by perceiving the problems from the 'networked' and connected perspective.

- From a systems thinking view point, learners should be able to view problems holistically, also seeing the web of relationships of the constituent parts of the problem. As presented in the literature review of this thesis, learners should understand a system as a whole, and how it relates to larger relationships with others systems in which it is nested.
- This thesis demonstrated that there is need to reconsider traditional instructional methods. Students must be confronted with ambiguity, uncertainty, complexity, and multiple conflicting perspectives. Learners must have the requisite variety of skills to handle the messiness of real-life decision making.
- In reconsidering the learning environment, the issue of a student based learning environment cannot be ignored. The learning environment should be similar to some real world application or discipline. It must go beyond content. Multiple disciplines, multiple perspectives, collaboration, and complexity thinking, must intentionally be infused in the teaching process.

- Third, expand the scope of the learning goals:

In expanding the learners scope, I borrow from the ideas of Cabrera (2006) and (Meadows and Wright 2008) in suggesting that learners must be able to have a balanced thinking. They must think beyond and span between the local demands and the global demands, they must balance analytical thinking with synthesis. In addition, I also add the idea of (Heifetz and Laurie 1997) who propose the new dimension of getting to the 'balcony' in order to have a helicopter view of things. But obviously one cannot lead from the top, he also must feel the temperature of what is happening on the ground. All-in-all there must be a balance in both horizontal and the vertical scope of leadership thinking in the learners.

As argued in section 3.3, there is need to promote soft skills: Judgement, critical reasoning, problem solving, adaptation, and flexibility.

An important point in expanding the learning goals is the need to move from individual geniuses to collective intelligences and competences. In fact, it is not just a case of collectivity versus individuality, but a situation of collective possibilities arising in the conjointly specifying activities of self-governing individuals.

Another issue, is the recalibrating achievement; there is need to move from learning to know as discussed in section 5.6 to learning to know and create. In addition, success should be considered in softer aspects such as improvement in the quality of life than the quantitative measure of gross domestic product (GDP). How this relates to learning, is that success will be considered in the context of sustainability, and other related issues and

never in isolation. As discussed also in section 3.6, such holistic consideration of success will help us to escape the errors of structuring problems.

Perhaps the last and most interesting point in this section, but none-the-less, not least, is the idea of 'going forward by looking backwards.' By this I mean we must be able to consider the application of the latest technology in unlocking value in indigenous knowledge and practices. There are new possibilities in this area, from medicine, leadership, and the list is endless. To shed light, there is a rich heritage in our Shona idioms with regards to systems thinking and collaboration. For example: *rume rimwe harikombe churu (one man will never encircle a mountain)*; *chara chimwe hachipwanyi inda (fingers do not work in isolation)*; and it takes a village to raise a child, the list is endless. For me, there is untapped leadership nuances from our background, which has great potential to unlock potential in our contextualised settings. In light of Covid-19, where there was restriction in movement, the idea of localised ingenuity that is proposed in this thesis becomes handy. Creativity implies that learners must not only import knowledge, but also inform the body of knowledge with new possibilities from their context. To that end, I cannot overemphasise the need to adjusting or redefining the values, assumptions, and beliefs shaping the learning goals and learning outcomes.

- **Forth, reconceptualising the learning environment**

While schools in remote parts of Zimbabwe face the challenge access of technologies of learning, learning ICTs are now available and being used in most urban schools in Zimbabwe. In fact, the challenge of urban schools that may be worth considering is the full utilisation of such technologies. Systems thinking offers various tools that can create the 'real-world' learning environment that is proposed in this thesis. One such handy tool, is simulation-based learning (SBL). The advantages of SBL are numerous. First, it gives exposure to students of real life practical problems. Second, learners are immersed into the complexity of real life and thus can apply their cognitive skills practically. Third, a wide variety of problem contexts are available in SBL. In fact, both teachers and learners can customise learning environments that will suit their learning needs. Fourth, another key point that was stressed in this thesis was collaboration. SBL offers an option for students to collaborate with various stakeholders; students, mentors, teachers, and even industry specialists. Fifth, teachers can design problem-based teaching thus move away from theory-based teaching.

5.10 Why is a culture of entrepreneurial thinking important for Zimbabwe?

The fourth objective of this study was to establish the relevance of Entrepreneurial Leadership thinking to Zimbabwe's socio-economic development. As argued in the literature review chapter, boundaries of learning

have been redefined. The issue of globalisation cannot be ignored. Similarly, the use of technology, more specifically artificial intelligences, the internet of things, and robots have changed the learning landscape. If the classification of industrial eras as proposed by Davison (2011) is anything to go by, then it implies that Zimbabwe needs a serious leapfrog from the agrarian mode that is advocated by its policies to the fourth industrial revolution. This calls for a shift in thinking to match the demands of the fourth industrial generation. Another important point to note is that technological improvement and social invention are highly dependent. In fact through their interdependence, they shape each other. Moreover, if rightly conceived, they have synergistic opportunities that will create more possibilities in each phenomena. As argued by researchers, social invention will result in educational entrepreneurship. This will not only transform people to think entrepreneurially, but new product, new markets, and new ways of leadership and working will be realised.

What has also become clear is that the youths must manage themselves and resources. In fact, they must be able to make most or optimise the use of each resource. Secondly, they must be constant learners, learning from each other. Moreover, they must be able to learn to handle change and even influence it. This requires them to think off the cuffs entrepreneurially, and to better use their adaptive skills in order be relevant. They must not be limited in thinking to stop just at survival. They must be able to leverage opportunities, reframe the future and create new possibilities. This means that there will be a possibility for new innovations and inventions if entrepreneurial thinking is embraced.

Another important aspect to consider for Zimbabwe is progress, more specifically improving the quality of life of each citizen. With an ordinary citizen living on average on less that one United States Dollar a day, improvement in the quality of life must be an intentional option for the GoZ. It is clear that there are two extremes with the economy; the very rich and the too poor. The middle class has thinned away. A closer look at successful economies show that much business revolves around cars, the social media, entertainment, and food. If Zimbabwe has to rebounce on the quality of life, then it must reconsider recreating the middle class. While there is much talking about agriculture and mining in Zimbabwe, the reality is that global trends have created a new normal. There must be much innovation centring on services that created by new technologies, and this obviously justifies entrepreneurial thinking which is at the heart of this study.

5.11 Innovative Collaboration

The last objective of this study seeks to answer the question - What are the initial conditions that you have to work with and what are the strategic conversations you need to engage in? The underlying objective of the study is to investigate the possibility of improvement. However, this objective will not go without red tape. In that light, a few glitches can be envisaged:

Firstly, there would be a tendency to reject foreign institutions in spite of their contribution to progress. The 20th Century, has been characterised by an emphasis on decolonisation, black empowerment, and indigenisation laws. This notion ignores the support and contribution of these foreign institutions in the development process. One thing to remember is that the world has become global, and as such, the support of the global partners is also important.

Secondly, there may be a lack of impetus to change. In Davison's view, Zimbabweans must believe that progress and prosperity is real. Furthermore, in order to leapfrog to creativity and innovation, predictive data which defies the entrepreneurial era must be rejected. Of course, we cannot ignore the robust frameworks and institutions provided in literature and foreign institutions. Empirical evidence shows that some of these frameworks are useful. One cannot therefore ignore that these foreign ideas provide relevant tools for effective EL development.

Collaboration of all stakeholders cannot be ignored in the innovation equation. The contribution of EL to psychomotor competencies, self-identity, independent complex thinking and adaptability is beyond reproach. The notion of innovative collaboration underpinned by a strong equilibrium of academic and practitioner leadership, remains an exploration agenda. To that effect, collaboration from all stakeholders and building mutually beneficial partnerships with business is emphasised. The idea of Innovation hubs as enshrined the HTE agenda for its 2030 vision must be cascaded downwards to grass root level. Ideas can be customised to meet the learners' level. Over and above that, there are possibilities of synergies between learners at HTE with junior learners. In addition, the idea of mass displays by the MoPSE where sports and culture are the main items, innovations creativity should be included.

5.12 Leveraging change from a System Dynamics perspective.

As discuss in the literature chapter, intervening in messy situations requires a deeper understanding of the leverage points. In this section, I will use the ideas of Meadows of leverage points to summarise the proposed changes, also I draw from feedback loop thinking and system archetypes from SD to look at possibilities using the same data as discussed in this chapter.

Leveraging for Change

In light of the Iceberg Model as discussed in section 3.8, and Meadow's leverage point model the following points of intervention are summarised in Table 5.5.

Table 5.5: Summary of intervention points according to Meadows model

Level of intervention	**Characteristics of the System**	**Proposed Interventions**
Parameters	Relatively mechanistic characteristics typically targeted by policy makers	• Implement learning approaches that support SEL. • assessments for SEL.
Feedbacks	The interactions between the elements within a system of interest that drive internal dynamics	• Create a TD team that assesses the KPR. • Monitor the KPI for SEL.
Design	The social structures and institutions that manage feedbacks and parameters	• Design a policy for SEL. • Provide support structures, from policy makers, to the MoSEAC, and in schools for the proposed systems as discussed in the findings chapter. • Provide adequate training and funding for SEL.
Intent	The underpinning values, goals, and world views of actors that shape the emergent direction to which a system is oriented	• Reframe the world view of learning to include in the curriculum a systemic entrepreneurial leadership world view. • Focus not on students creative and innovative abilities. • Have a strategic intent for assessing for SEL.

Source: Author

5.13 System Dynamics Feedback loops, and Archetypes

As discussed in literature, archetypes are the underlying systems that drive the behaviour of the system. This idea was drawn from the work of Peter (1990). Four feedback loops are discussed which were created as reflections of the underlying systems that drive the idea of EL in learning: Influence of systemic entrepreneurial leadership teaching; policy intervention loop; improved learning goals; and entrepreneurial leaders stock and flow diagram.

5.13.1 Influence of systemic entrepreneurial leadership teaching feedback loop

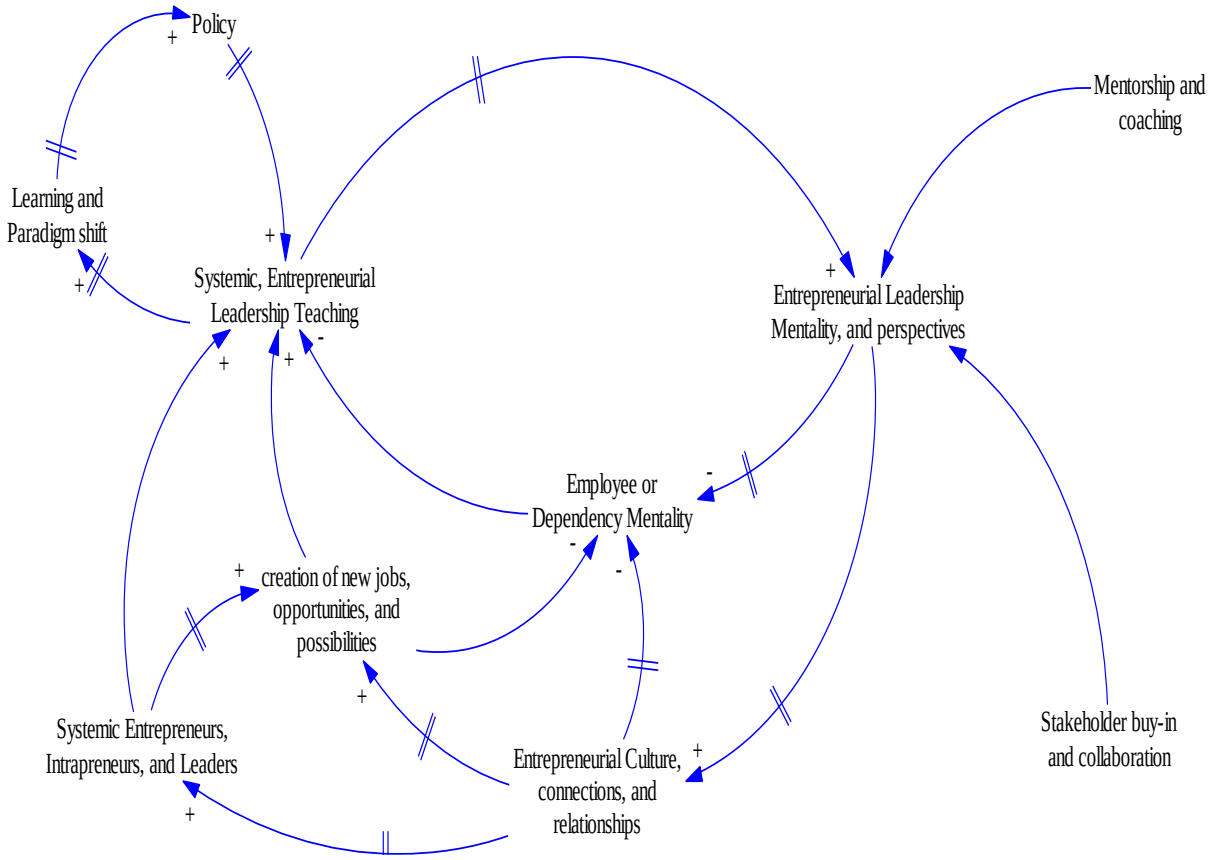
Figure 5.19 shows the impact or effects of Systemic Entrepreneurial Leadership teaching. According to the model represented by Figure 5.19:

- The first loop to the left, shows that SEL teaching is influenced by policy interventions. This means that a paradigm shift in policy that supports the teaching of SEL, have a reinforcing effect on future policy interventions. Future policy interventions will benefit from the learning curve effects of implementing this program.

- Other loops then are all linked to the teaching of SEL, and they show that the teaching of SEL will improve Entrepreneurial leadership mentality and world view of the learners. The thesis as argued in the section 5.6 posit that once learners are able to think entrepreneurially, making and seeing the connections of their thinking to other variables, then a culture of entrepreneurship will develop and subsequently improve. This implies that on one hand, the dependency mentality can be curtailed, while on the other, the pool of entrepreneurs who will create new jobs and possibilities increases.

- Two key variables that have influence on SEL teaching are mentorship and coaching; and stakeholder buy-in and collaboration. These will help in shaping the thinking skill of the learners. These are not the only variables that have such influence, but they have been restricted to two for brevity of the model so that it can be well clarified and conceptualised.

Figure 5.19: Influence of systemic entrepreneurial leadership teaching feedback loop



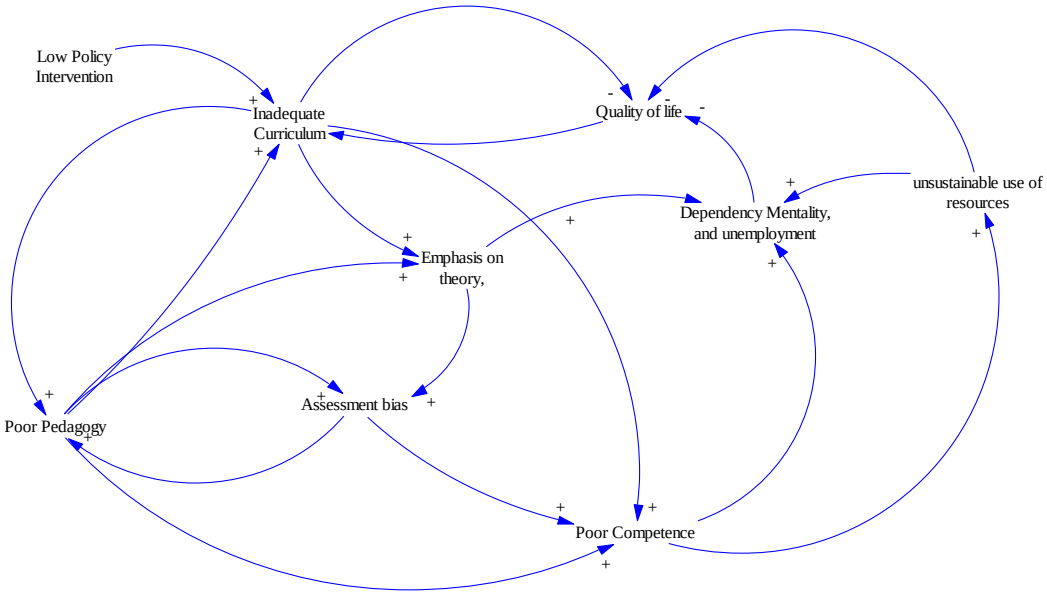
Source: Author

In essence, Figure 5.19 shows that the variable in the teaching process are not linear, they have circular feedback loops implying that any change has to be thought through from a holistic perspective.

5.13.2 Policy intervention loop

The next feedback loop shows low policy intervention feedback loop.

Figure 5.19: Policy intervention loop



Source: Author

As depicted in the model in Figure 5.20, if there is poor policy intervention, it leads to poor pedagogy, and this results in teaching which is skewed towards theory, and an assessment bias towards this theoretical teaching. This means that learners' competencies are compromised. Once the competency of learners is affected, it implies that the skills mismatch between what industries requires and what the learning institutions will be providing, will increase. Such warped pedagogy will also produce dependency thinking in learners.

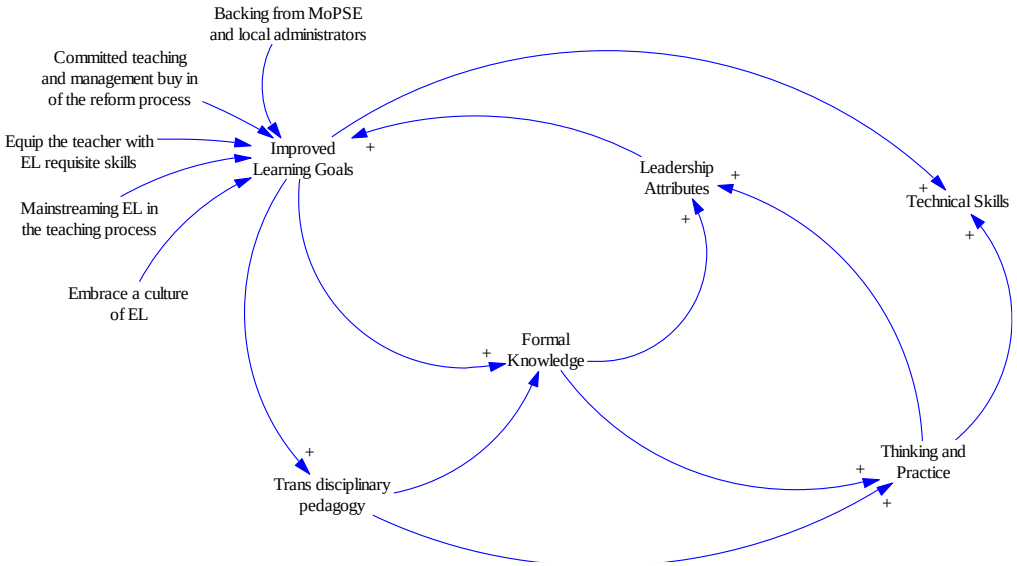
From Figure 5.20, incompetent learners will have a dependency mentality and will use resources in unsustainably. This inefficient use of resources and energy will result in poor quality of life. The implications of this model is that unsustainable use of resources have negative impacts to global warming and climate change. Although this thesis has nothing to do with climate issues, it is interesting to note how such issues emerge from a systemic worldview. What this means is that the impacts of poor policies should never be under estimated. This model seems to inform some possible discussions around poverty challenges for Zimbabwe in the context of improvement in the quality of life. In summary, there are significant benefits of connected, feedback loop thinking.

5.13.3 Improved learning goals feedback Loop

The third model regards improvement in the learning goals (LG). This thesis argues that one of the major culprits in learners exit profiles are poor learning goals. As represented in Figure 5.21, there are various factors that influence these learning goals, which include among them: Support from the higher offices and hierarchy; committed teachers and management; supply of resources; improvement of the teaching process and

mainstreaming critical skills; and embracing a critical cultures. From Figure 5.21, improved learning goals will result in the increase in the quality of knowledge, this will in turn help learners to apply such knowledge in their practice and thinking process. This also reinforces technical skills and leadership competencies. For both teachers and learners, other benefits are derived from improved learning goals which may include transdisciplinary learning.

Figure 5.20: Improved learning goals feedback Loop

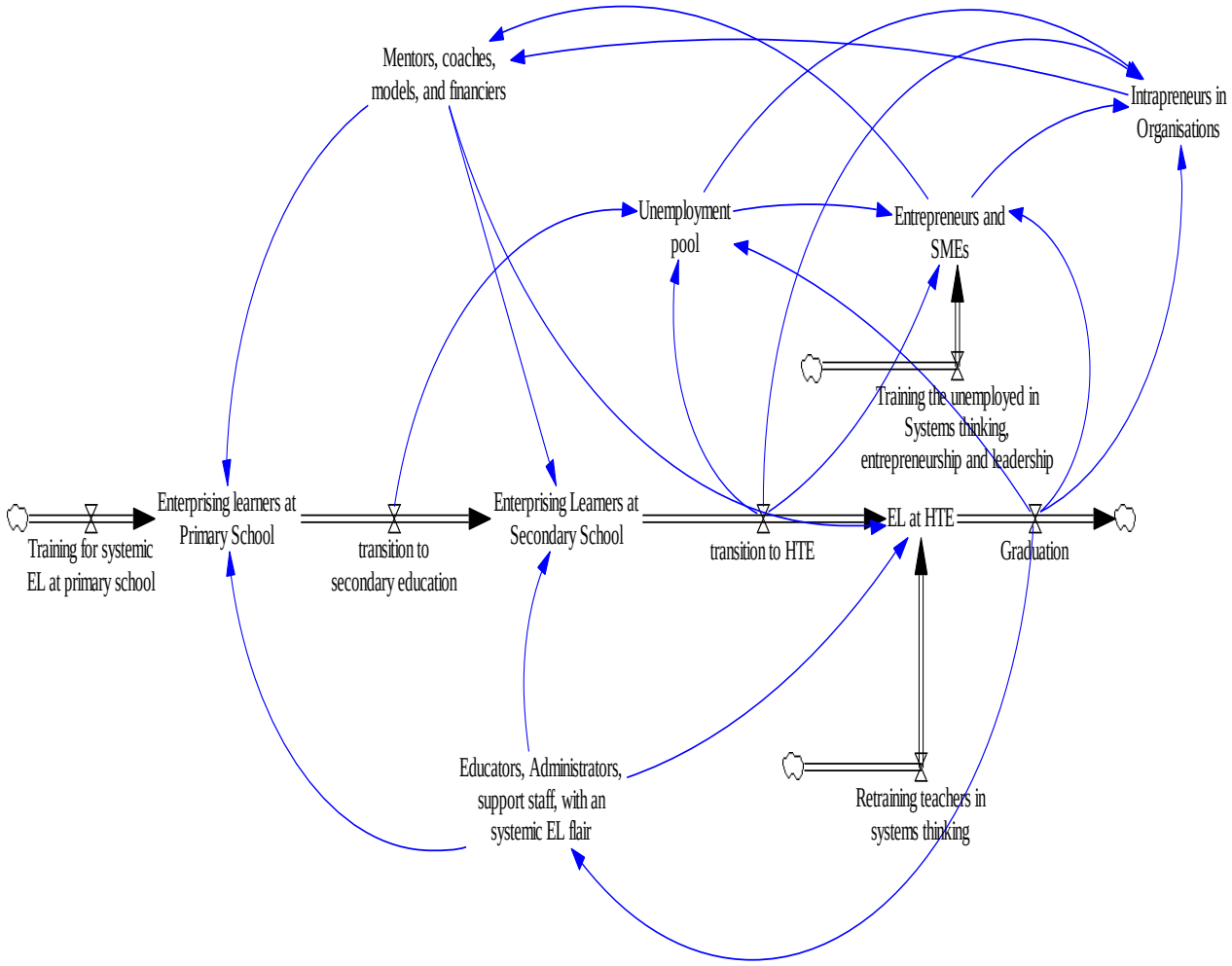


Source: Author

5.13.4 Entrepreneurial leaders stock and flow diagram

Figure 5.22 summarises why systemic entrepreneurial leadership must be taught, which has been the main focus of this thesis. Represented in this model are stock and flows. Four stocks (pools) are represented in this diagram: Enterprising learners at primary school; high school; tertiary; and the last pool is that of entrepreneurs and intrapreneurs. These stocks are affected by the rates which include the concerted teaching efforts towards EL. This will improve the pool of entrepreneurial thinkers across the learning continuum. Those who missed the training opportunity can be included through continuous development programs which will equip them with the requisite skills in entrepreneurial teaching.

Figure 5.21: Entrepreneurial leaders stock and flow diagram



Source: Author

5.14 Evaluating SSM as a framework

The concepts underpinning SSM were relevant to the inquiry process. First, as argued by Cabrera (2016: 156) systems thinking affords 'new thinking' in approaching problems. In thinking differently, SSM provided a deeper understanding of the variables in the system of learning. Its inquiry process unearthed the deep relationships and the interactions of variables. Through discussion and the use of metaphors, particularly the Iceberg metaphor, participants were able to see that events, behaviours and structures were influenced by deeper structures. These deeper structures include mental models, or intents (Meadows 2002, Abson et al 2017). Through SSM, participants appreciated that Learning Systems (LS) were complex systems, and non-linear. Moreover, in reviewing why certain policies were 'stubborn' to policy initiatives, SSM helped the participants to understand how change was embedded in deeper leverage points.

Second, in the finding out stage as outlined in section 5.2.2, another positive of SSM was the collaboration of people of different minds, and divergent views in focus groups. Through engagement and debate in problem solving, rich contributions emerged. Stakeholders appreciated that actions to any improvements required accommodations of differing worldviews. Besides, SSM provided a platform where meaning could be constructed and interpreted in relation to the problem.

Third, it provided a platform through its conceptual model to explore the problem from a strategic intellectual view point. The cultural stream of analysis (section 5.2), the rich picture (section 5.5), and the conceptual models (section 5.6), were used in aiding interventions and subsequently implementation. These models were useful in exploring the interconnections and interactions of the subsystems in the broader scale of the education system that was under investigation. To that end, SSM gave a structured way of looking at the problem. In comparing the conceptual models to the real world, it became apparent that SSM connected theory to practice.

Fourth, SSM constitutes a continual learning process. The acronym LUMAS meaning a learner by user assisted methodology as explained by Howell facilitated learning in the participants. Participants were able to iterate and reflect on the problem through engaging them in more than one workshop, and the use of the knowledge café approach. Apart from the proposed improvements that culminated from the focus group sessions, it cannot be refuted that the iteration between the approach, users, and the methodology also 'constituted' an improvement. Participants were able to appreciate that systems involving humans were open systems and could evolve through purposeful actions, reflection, learning and interpretation of meaning from information from the system.

Fifth, another important debate in research is the validity of the findings. As argued by Wilson (2004), the robustness of a qualitative approach can only be measured on the defensibleness of the assertions. In my case, the trail of defensibility can be traced to the use of SSM tools of: the rich picture (section 5.5); root definitions (section 5.6); CATWOE analysis for each root definition; conceptual models, and the comparison (section 5.7). Arguably, such a robust process answers the question of validity.

Finally, the experiences that were created through the workshops and the participation of junior students with seniors provided rich insights for future collaborative learning. One cannot discount the effects of the interdisciplinary discussions, and how they will influence future innovations.

5.15 Evaluating System Dynamics as a framework

As argued in Chapter 3, SD has been a useful framework in showing us the underlying system that drive systems. The theoretical framework informed the processes of this study. Furthermore the formulation of four models in the form of feedback loops was an eye opener to the participants and myself.

5.16 Focus group evaluation

Subsequent to the focus group sessions, I conducted evaluation interviews in order to learn from the participants' experiences. The thrusts of the evaluation were: the lessons they had learnt from the focus group; the successes of the focus groups; observations and reflections; and any changes in future focus group activities. The results are as follows: First, some students exhibited limited knowledge of EL as this was an idea that was not commonly discussed or taught. Second, it was noted that education played a significant role in shaping the career of students.

The following were positive remarks regarding the focus groups: To begin, there was active student engagement, some were open to change and embraced the ideal of EL. Students actively worked together in groups and in teams learning from each other and from different levels of stages of learning. As the focus group proceeded, there was increase in interest, cooperation, fun, and engagement. Moreover, students enjoyed the focus groups, and were keen on having such groups in future. They registered that they had learned and benefitted from the discussions.

An evaluation of the conceptual models shows that it informed the participants of the dynamics of the interacting variables, the interdependencies, feedback systems within a system and the deep leverage points that were most likely to produce desirable change. In addition, participants appreciated the idea of system structures, particularly the sub-systems that were nested with bigger systems, thus applying a holistic worldview. It became easy again for participants to realise why certain changes of policy yielded results that were negative from the intended objectives.

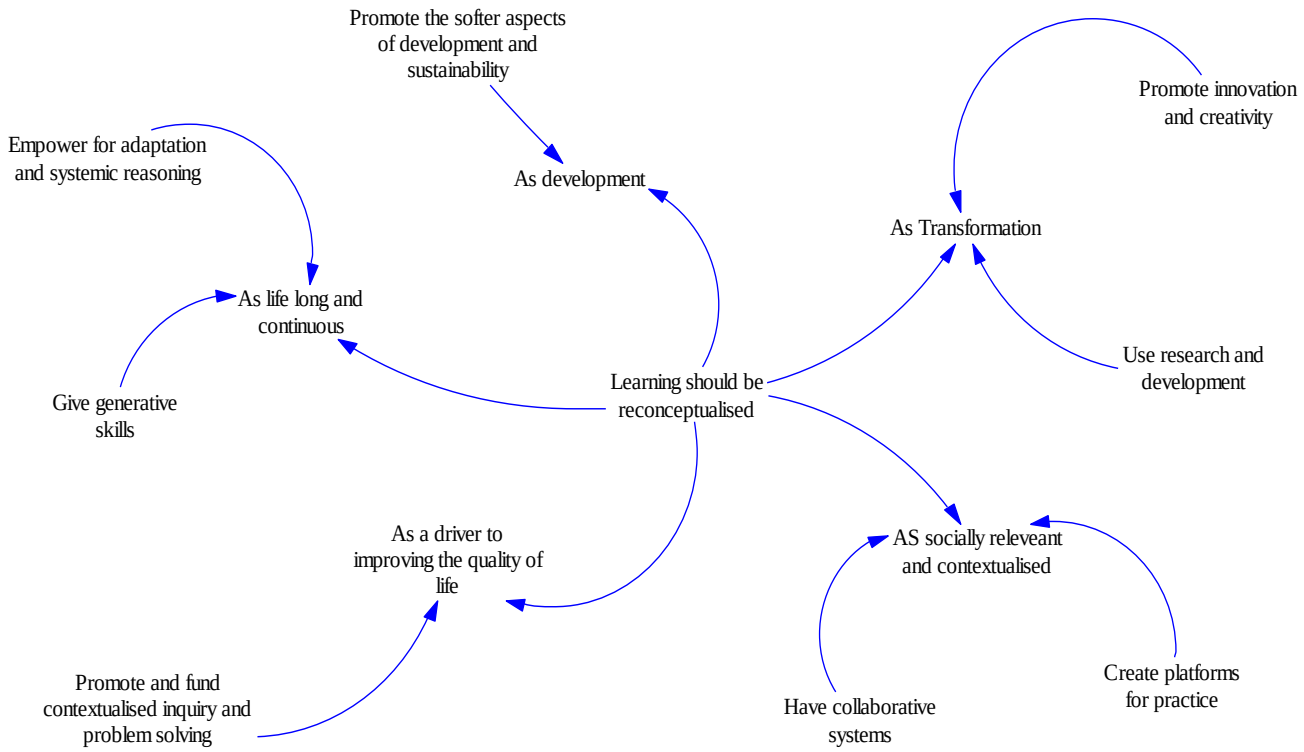
It is also important to note that the debate and the negotiations in the process of coming up with the conceptual models, participants challenged their mental models. According to Bell and Morse (2013) SSM provides a platform for the group to discuss, negotiate, share, and hopefully to arrive at a consensus. Systems thinkers argue that challenging the assumptions, beliefs and values will influence perspectives and ultimately actions. Moreover, the process of formulating conceptual models allowed participants to discuss, solve problems and review their own issues and concerns. The use of diagrams, more specifically the rich pictures, provided a platform to allow groups to explore their subconscious assumptions and conflicting world views.

Encouragements included the following; more time was needed in future, students felt that engagement for 45minutes was not ample enough for them to express their views.

5.17 How can students' best learn entrepreneurship?

If entrepreneurship is to be core, the findings as discussed in section 5.3, seem to suggest a reconceptualisation of learning. This transformation focuses on a new look at learning that places learning as the hub of sustainable development, and Figure 5.23 sums the idea.

Figure 5.22: Reconceptualisation of learning



Source: Author

A closer look at Figure 5.23, shows that learning is an anchor to sustainable development, and is also socially embedded. From the findings, five focus areas are suggested: reconceptualising learning as development; as a vehicle for transformation; as socially relevant; as a driver for improving the quality of life; and as lifelong and continuous. Drawing from Meadows work on leverage points (section 3.6), this thesis proposes a strategic intent aimed at mainstreaming entrepreneurial learning in all learning approaches.

As highlighted in section 5.6.1, this study showed that there was need to create a system for an awareness of entrepreneurial thinking in learning. The conceptual model outlining the activities are discussed in (section 5.6.1). Central to this proposed CM, was the idea of creating a new culture of entrepreneurial thinking. Such culture should be mainstreamed in the learning environment and learning approaches. To complement improvements in the learning environment, a shift from knowledge consumption to knowledge creation was suggested (section 5.6.2). In this model, the learning environment must be learner-centred, promoting both individual and collective participation in knowledge creation. Results indicated that there must be a wide application of ICTs in creating flexible learning spaces. One important factor that is emphasised in this thesis is complexity thinking and its implications in learning is discussed in the next section.

5.18 Chapter summary

The chapter presented the results of the application of SSM at HSC with the aim of improving the teaching and learning process for EL. The results indicate that not much is known about EL in teaching and learning. There is virtually no attempt by the teachers to embed EL in their teaching approaches. It was also noted that barriers to change in implementing changes in the curriculum included negative perceptions, cultural bias, and strong preference towards theory based achievement. Evidence show that there was little effort in aligning the curricula towards entrepreneurship. Moreover, results show that there was very little involvement of industry, and parents in the process of curriculum change, the learning process, and evaluation. Themes emerging were presented in rich pictures, and concept maps, as well as a description of these emerging themes was discussed.

Given these challenges, this chapter presented 9 models in the form of human activity systems that were aimed at transforming the curricula and the teaching process to embrace EL. Feedback loops using System Dynamics were discussed. All models were critiqued and compared to literature. The activities constituting the conceptual model were validated and compared with the prevailing context. The results of this comparison phase was presented in this chapter.

The next chapter provides the concluding remarks.

CHAPTER SIX – CONCLUSIONS AND RECOMMENDATIONS

6.1. Introduction

This research used the Soft Systems Methodology to explore ways in which improvements can be made in the teaching and learning process in order to enhance entrepreneurial leadership skills. The study was conducted at Hilbright Science College in Harare, Zimbabwe. This chapter first outlines the conclusions drawn from this study, and recommendations for future research. Second, the limitations of this study are highlighted. Finally, the concluding remarks and a condensed overview of the study is provided.

In order to explore the transformation agenda in pedagogy in Zimbabwe, it was important to follow eight objectives in this study. The first objective was to establish the relevance of entrepreneurial leadership thinking to Zimbabwe's socio-economic development. This was important in that it justified and tested the relevance of the intentions which underpinned this research. A review of literature demonstrated the shortcomings in the education system (Chapter Two), some of which were embedded in the architecture of the curriculum. Literature demonstrated that globally education systems are evolving to match the trending demands of learners. Literature demonstrated that the socio-economic challenges – high unemployment, complexity of the environment, and uncertain futures justified the need for a learner who was entrepreneurially-oriented.

In light of the challenges presented by the context which was described as being volatile, uncertain, complex and ambiguous, it became necessary in the second objective to explore how Systems Thinking would inform Entrepreneurial Leadership in learning. Various tools were provided - holistic thinking, feedback loop thinking, interrelatedness of system elements, and how systems were resistant to change were discussed (Chapter Three). Most importantly, among the Systems thinking approaches, Soft Systems Methodology (SSM) provided a scaffolding of the research design. The findings as discussed in Chapter Five follow the qualitative approaches as specified by this methodology.

The third objective was to establish the systemic forces that existed in the existing education system and to establish the kind of education which was appropriate for the emergent age. Using a Systems Thinking framework (Chapter Three), these underlying challenges were mapped. Results from the focus group workshops (Chapter Five) culminated into a thematic mapping of the challenges and a representation of the problems in the form of a Rich Picture (section 5.5). The Systems Thinking framework provided a useful conceptual lens of these systemic challenges and it also equipped me with a 'consciousness' of how systems behave in relationship

to the broader systems in which they were embedded. In addition, through the methodological tools of the Rich Picture, the problem situation and the nuances were elaborately outlined. The last two objectives sought to investigate the leverage points that would provide the most effective interventions, and to explore the mechanisms that the education system could employ in order to ensure that the systemic entrepreneurial leadership was embraced. Using the focus group workshops, nine Human Activity Systems were proposed (Chapter Five), and triangulated in these workshops. These change interventions were proposed with a systemic consciousness, in order to make accommodations of the diverse world views and to balance the power dynamics in the change process. In order to demonstrate the impact of the proposed changes both on the education system and the other elements in Zimbabwe, four causal loop diagrams (feedback loops) are discussed in Chapter Five. Overall, the findings of these objectives had a role in informing why a culture of entrepreneurial thinking was important for Zimbabwe, exploring the initial conditions needed for a successful implementation of EL in learning.

6.2 Summary of main findings

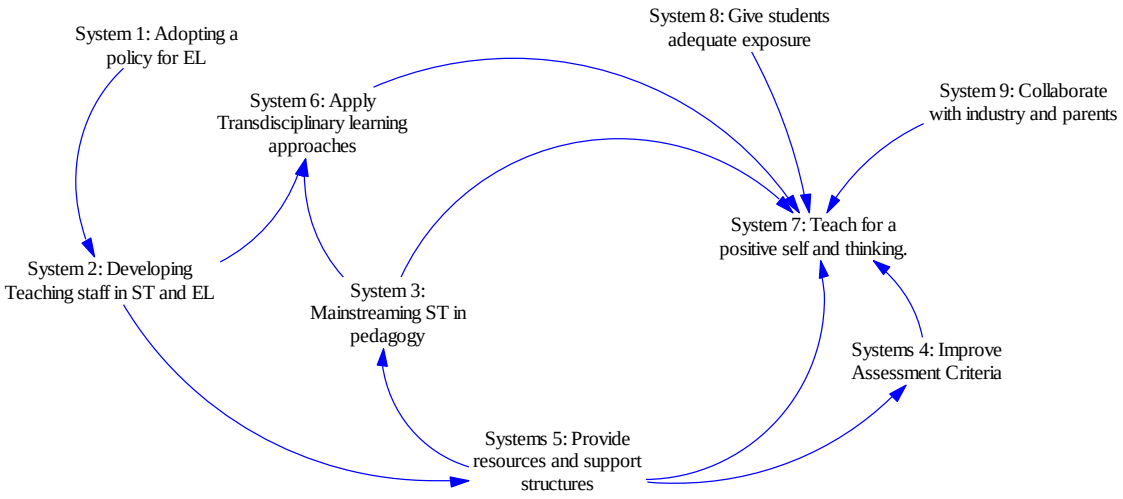
The literature review (Chapter Two and Three) informed the study on Systems Thinking approaches, and more specifically Soft Systems Methodology and System Dynamics. Using four SSM stages, this thesis conducted a systemic inquiry into challenges of EL in learning as discussed in Chapter Four, application of SSM and discussion of the results in Chapter Five. The first stage of the study was "founding out" and a comprehensive representation of the problem situation was represented in a thematic map (section 5.4) and a rich picture (section 5.5). The rich picture formed the basis for identifying the relevant human activity systems (HAS) needed for improvement (section 5.6). The HAS comprises of a root definition specifying the main purpose of each system that was proposed, and a conceptual model outlining how the system would be achieved. Nine HAS were constructed (section 5.6). In order to validate these conceptual models, two workshops with senior teachers, management, and education officers was facilitated. The other objective of the workshop was to discuss the proposed interventions and to balance the power, cultural and feasibility issues. The nine HAS developed include: Promoting Entrepreneurial thinking; Stimulating knowledge creation; Helping learners to apply systemic thinking; Promoting positive self-concept; Parental collaboration and awareness; Improving students exposure to practical realities; Embracing transdisciplinary teaching and learning; Formative and summative assessments; and Human capacity development in teacher training institutions. Incoming up with these conceptual models (HAS), the worldview of an adopting a systemic approach in enhancing entrepreneurial leadership in learning was adopted. Each conceptual model was aimed at representing a transformation process together with the relationships and influences between teaching and learning systems' components.

The key finding from the evaluation of the conceptual models was their capacity to illustrate and make aware to others the landscape function dynamics and potential points of intervention for landscape practitioners

6.3 Contributions

This study provides a model of intervention in pedagogy to equip both learners and teachers with systemic entrepreneurial leadership skills that will help them to cope with the complexity of the ever-changing socio-economic landscape. To the best of my knowledge, there is limited literature involving systems thinking, entrepreneurial leadership in Zimbabwe. Firstly, nine human activity systems were proposed as summarised in Figure 6.1, and 6.2 redrawn from Chapter Five.

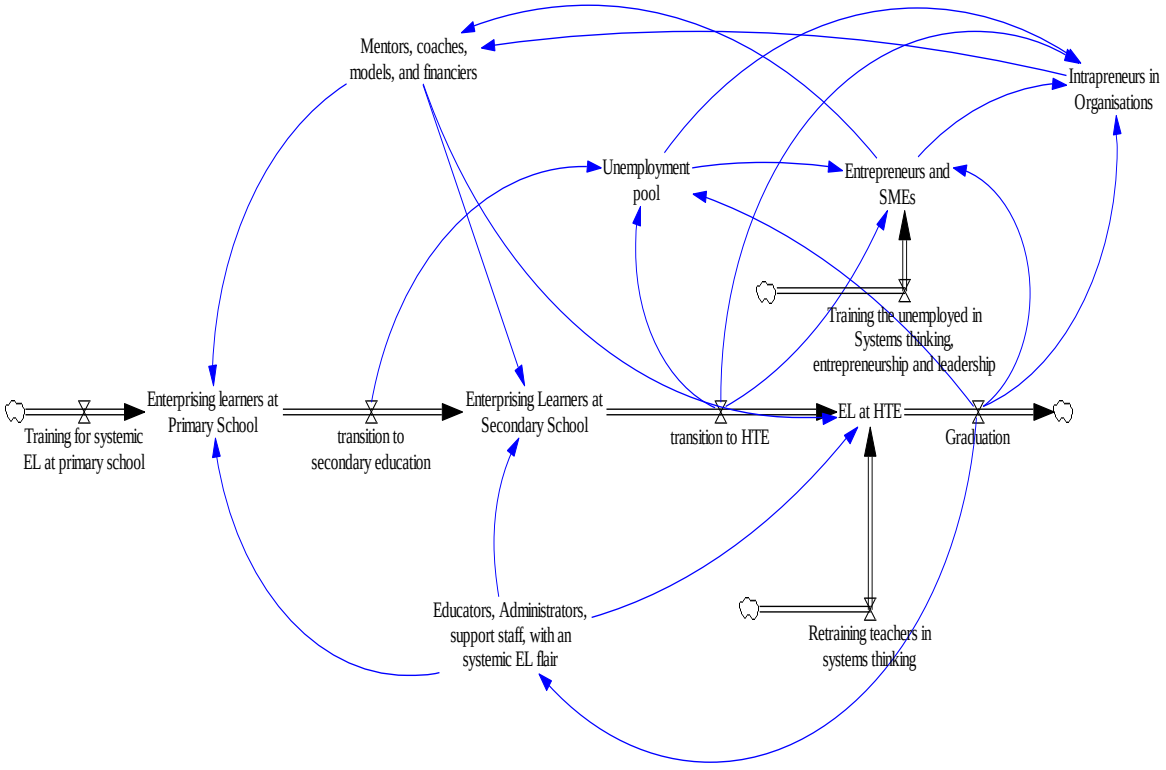
Figure 6.1: Summary of the main activities in the HAS (redrawn from Chapter Five)



The conceptual model summarised in Figure 6.1 is a good starting point for debate around a conceptual framework for changes in curriculum and change implementation in learning. It provides key considerations - change in thinking; holistic approach to problems; problem structuring approaches; problem representation; model formulation; simulation and debate. Moreover, the idea of equipping learners with an understanding of systemic thinking - an appreciation of systems in the context of the whole, is indeed a priceless principle. This study has demonstrated that this is a requisite competence for an environment that is volatile, uncertain, complex and ambiguous. This study has demonstrated that Entrepreneurial Leadership is now a topical consideration (Chapter Three), and suggests that the marginalised poor in Zimbabwe who live barely below a dollar a day, should consider changing their mental models from dependency to self-sufficiency. The models provided in this thesis become a possible heuristic and intervention for both emancipation and learning.

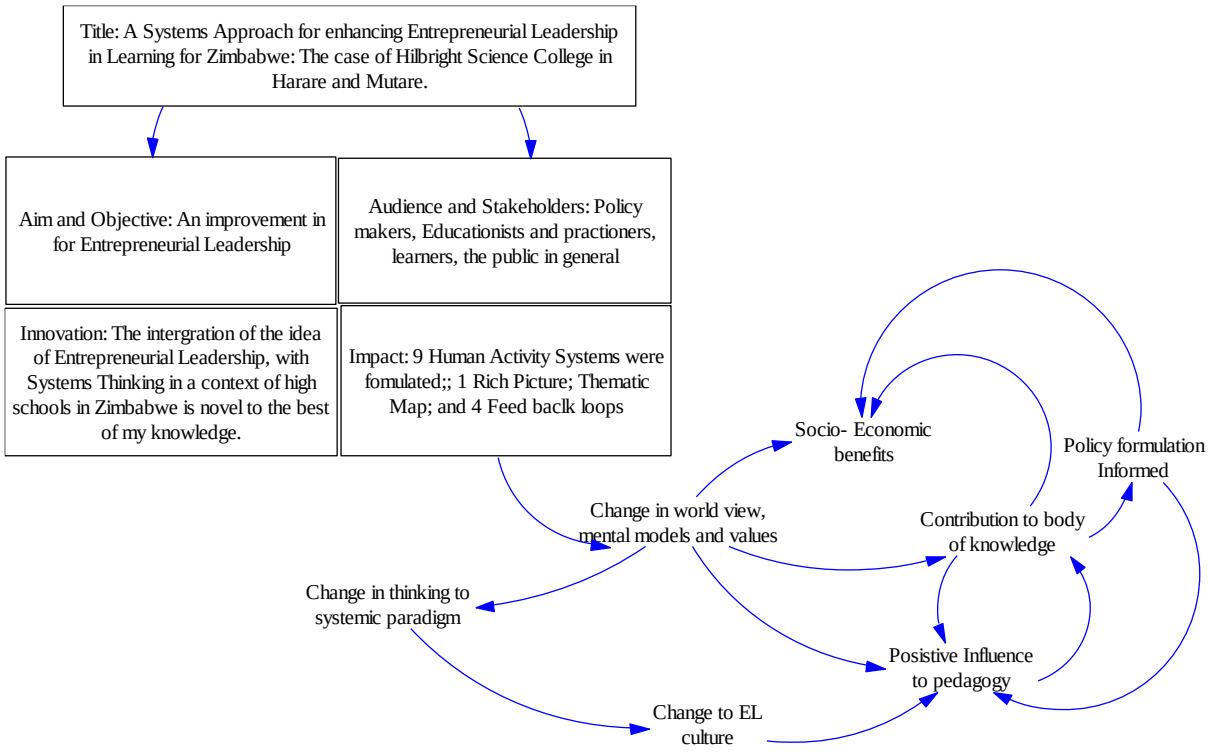
The use of feedback loop thinking as represented in Figure 6.2 is potentially useful in informing literature in Zimbabwe around systemic forces that impede change initiatives. This thesis has proposed leverage points which must be tweaked for change and the potential outcomes and benefits. In essence, I argue that the proposed models, including their simulation will aid leaders, education practitioners, and leadership scenario planning, adaptation and strategy.

Figure 6.2: Stock and flow diagram of EL pools emerging from the teaching exercise (Redrawn from Chapter Five)



In order to present a simple summary of my study, I have drawn a quadrant chart, summarising the study, the aims, the audience, stakeholders, innovation and the impact of the study as shown in Figure 6.3.

Figure 6.3: Quadrant chart summarising the study, the aims, the audience, stakeholders, innovation and the impact



Source: Author

6.4 Recommendations

Over and above the proposals as discussed fully in Chapter Five, the following recommendations are proffered:

- This study showed that in order to improve the curricula for EL, there must be a clear vision and policy for teaching for systemic EL. Such a view must be transcended of the mere transmission of facts ‘about’ EL and rather must embrace the ideas of teaching ‘for’ and ‘through’ EL as discussed in this thesis. Once the policy framework is formulated, it must be effectively implemented, mainstreaming EL in the teaching process.
- In order to close the gap and the mismatch between skills demanded and actual skills acquired, a policy to engage the learners in real life problem situations through parental and industry collaboration is proposed. The benefits of such collaboration is to provide the learner with adequate practical exposure to move from a theory-based learning approach to a practice-based pedagogy.
- Results indicate that systems thinking is a fairly new phenomenon in Zimbabwe. To that end, there is need to introduce ST in institutions of higher and tertiary learning, teacher training colleges, as well as in primary and secondary schools. This study noted that while the MoPSE was in charge of the teaching in primary and

secondary schools, the mandate of training teachers rested with the Ministry of Higher and Tertiary Education. I therefore propose a realignment of this training function so that the curricula demands of the MoPSE are met.

- Apart from policy issues, the study also showed that the pedagogy process needed a relook. I recommend the adoption of a thrust in soft skills that will complement the competence based curricula which is the current thrust of the MoPSE, related to pedagogy, and transdisciplinary learning approaches are proposed. Such a move should be possible given the increase in access to information communication technologies (ICT) in learning. These ICT platforms are potential hubs for the proposed transdisciplinary learning.
- Lastly, no change will be effective without buy-in. First, from leadership at all levels, teachers, students, parents and the general public. A distributed leadership strategy is proposed. This means that leaders and problem owners at different management strata in the pedagogy system should be empowered. They must have the power of execution, and implementation.
- Other changes specific to learner changes are discussed in Chapter Five.

6.5 Limitations

First, as argued by Sterman (2002), all models are wrong. This mean that all models have their downsides. Ideally, no one has a universal view, because our conception of reality is influenced by, and limited to the context of the researcher. This implies that observations and interpretation of reality becomes value-laden and subjective to these contextual boundaries and lens. The models presented in this thesis represent conceptual tools which are meant to incite discussion for improvement and change. The possibility of omissions of critical factors that may be considered important is probable. This may be due to lack of exposure, expertise, experience and or omissions. As the reader will appreciate, with growth, such deficiencies may be rectified.

Secondly, as they say, it takes a village to raise a child, these models have not been implemented and simulated. This requires a lot of funding and input from others who will help in adding value to the foundation laid in this thesis.

Third, this thesis was done through a part-time study program. With my university and supervisor resident in South Africa, this means that a lot travelling was required to meet my supervisor in South Africa for mentorship and guidance. The competing demands of study, work and family presented a serious challenge. The quality demands demanded in these spheres came on a platter of much hard work and sacrifice. This obviously called for strict time management in order to provide the adequate attention for transcription, analysis, and

interpretation of data. I must admit that picking up the thread of momentum after breaks from study was often times a real challenge. Albeit, these breaks provided a breather and time to reflect. It was from such breaks that some flickers of new insights emerged.

Fourth, when doing a research in your work area, the possibility of bias cannot be eliminated. Some of the participants that formed part of my focus groups were from my campus, while the remnant were from the other campuses. The possibilities of familiarity barriers and issues of power were possible. However, I made sure that they gave their objective and honest opinions during the facilitation process and some also being professionals, were not restricted by the familiarity barrier.

Fifth, the research tools of the rich picture appeared novel and funny to others. Choosing the appropriate symbols to represent the problematic situation a challenge. It is true that the richness of pictures is the multiple interpretations and meanings that may be attached to it. Certainly, ascribing a symbol to mental models, attitudes, and the other softer aspects of the study method never reached a consensus and it was also not possible to include every detail in the picture. To that end, it is possible for similar studies to produce a different representation altogether. This does not discount the confirmability of the results, but attests to the diversity of world views and interpretation.

6.6 Areas of further research

Several areas for future study emerged from this study. The areas of further research pertain to Complexity thinking in higher education; the use of SSM in learning; and application of systemic reforms in the curriculum. The items are discussed below:

6.6.1 Linking the United Nations Strategic Development Goals (SDGs) to Entrepreneurial Leadership and Systems Thinking.

From the study revealed it can be argued that quality education is key to the economic development of any nation. Further study linking SDG number 4- (Quality Education), SDG number 8- (Decent work and economic growth), and SDG number 11- (Sustainable cities and communities), with Entrepreneurial leadership and Systems Thinking promises interactive outcomes and possibilities. Further study could focus on:

- Using entrepreneurial leadership thinking to understand quality education.
- Thinking entrepreneurially to achieve sustainable cities and communities.
- Likely influence of entrepreneurial leadership on industry innovation/ infrastructural development.

6.6.2 Complexity thinking in higher education

The study indicated that there is need to embrace complexity thinking in the teaching process and further study should focus on:

- Examining the effectiveness of implementing complexity in teaching in high schools and primary schools.
- Investigating the opportunities for mainstreaming complexity thinking in the teaching process.
- Exploring ways in which complexity skills can be evaluated in all levels of the education system.
- Investigating how best the soft skills can be mainstreamed in pedagogy.

6.6.3 SSM and Entrepreneurial thinking

Future research should focus on:

- Embracing soft systems thinking in entrepreneurial teaching.
- Application of holistic thinking.

6.6.3 Application of curriculum reforms

This study has shown that there is a need for curricula reforms and that there is need for restructuring systems in the teaching process in order to effectively implement the reforms. Further, the thesis identified that there is need for retraining and reforms in the Teachers Colleges for entrepreneurial thinking to be embraced. To that end, the following areas are suggested for future study:

- Explore ways to cement collaborations in the teaching and learning process.
- Provide concrete experiences and practical representations of abstract concepts and principles.
- Investigate ways of facilitating learning in order to align with the objectives of future oriented education. In particular, innovation, creativity, discovery learning, life-long learning, just to mention a few.

6.7 Autobiographical reflection

I gained invaluable deep learning experiences and insights from undertaking this research. I have gained some understanding of action research and how problems can be solved. I now appreciate that the nature of research is holistic, iterative, sometimes messy, and complex. The complex nature of the research process provided me

with rich insights and timeless lessons that will help me in future research endeavours. I have learned, for example, that things do not fit neatly into categories and that research can be often times frustrating and sometimes tedious, yet immensely rewarding and even exhilarating. The rigor required reading, note taking, writing, editing and compilation of this study, undoubtedly has left me with indelible skills of excellence and rigor. This research study has also provided some key ideas which have helped me examine my own professional values, and guidelines for possible changes to my own future practice. Action research (AR) helped me to identify new innovations and initiatives which were more appropriate, and pertinent to the Zimbabwean learning landscape. While the challenges that are highlighted in this study may be generalised to different contexts, I learnt to deal with issues that affect the Zimbabwean people's lives in their own specific learning and social context. Furthermore, AR provided more in-depth research and analysis that is contextually relevant and practical.

As highlighted in the literature review section, SSM is a practical research methodology. To share an experience - the systemic mind-set of seeing the parts in relationship to the whole, the interconnectedness of variables, the diversity of players and world views, causality, feedback loops, and the effect of time delays were concepts confusing to me at first. Yet, with time, my appreciation grew, and thanks to my supervisor for the guidance and the leadership. Now, they stand out to be timeless principles engrained in me and have become part of the skills for intervening in problematic contexts. Undoubtedly, the research tools of the rich picture, the focus group interactions, and the debates, enlarged my view to effective facilitation and learning.

It may be important to highlight the lessons specific to SSM: Firstly, SSM helped me to handle complex systems and problems. Secondly, SSM provided a framework for structuring and sharing of knowledge in ever changing and dynamic contexts. Fourthly, SSM created a learning environment and through its iterative process, a structured reflection of learned lessons emerged.

Unlike conventional research, I found the process of action research as both demanding and exciting. On one hand, the notion of taking on responsibility for change along with research was energy draining. While on the other hand, the richness, depth, nuances, context, multi-dimensionality and complexity brought by qualitative research aims were eye opening and exciting. Another brighter side was that I was immersed in the study area and thus was not taken away from my normal business activities. The increase in the learning curve experiences were just enormous and I am persuaded that this thesis has direct relevance to both theory and practice.

6.8 To sum it up

This thesis has shown that the landscape in the social world is volatile, uncertain, complex and ambiguous. In addition, progress in the digital media and technology, demands a critical relook at learning in order to make it more relevant, and to bridge the skills gap between industry expectations and education. In view of the twenty-first century demands in learning, this thesis argued that it is critical to embrace systems thinking as a vehicle for curriculum development and pedagogy. The findings pointed to practical and conceptual implications for the school curriculum in this dynamic age. Nine Human activity systems were developed that will assist in shaping the future of the Curriculum and learning. Using SSM and SD, this study has shown how curriculum innovations can possibly inform policy, pedagogy, evaluation and school practice.

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Appendices

Appendix 1 - Letter of Information to School Children

LETTER OF INFORMATION
ASSENT FROM SCHOOL CHILDREN

Title of the Research Study: *A Systems Approach for enhancing Entrepreneurial Leadership in Learning: A case for Hilbright Science College in Harare and Mutare in Zimbabwe*.

Principal Investigator/s/researcher: Blessing Machona (MBA. ACIS)
Supervisor/s: (DBA)

Brief Introduction and Purpose of the Study:
Thank you for participating in my study.

I am a PhD student registered with the Durban University of Technology. The title of my research is ***A Systems Approach for enhancing Entrepreneurial Leadership in Learning: A case for Hilbright Science College in Harare and Mutare in Zimbabwe.*** The aim of the study is to explore a deeper understanding of Entrepreneurship, Leadership and System Methodologies in learning and how entrepreneurial competencies can be enhanced.

Procedures: I will be collecting information by means of semi structured interviews from you which will range between 15 to a maximum of 30minutes depending on issues that might want to be probed further. The interviews will be conducted at school at a time that will be convenient to you.

Risks or Discomforts: You are unlikely to experience any physical, psychological, or social risks, however should you feel uncomfortable or experience any problems due to your participation in this research, you may withdraw anytime without prejudice.

Benefits: There may be no direct benefits to you through your participation in this project. However, the outcome of this study might be of benefit to future students, yourself, and both the business and academic communities. It is also important to point out that there will be no benefits for the researcher beyond the gratification of completing the research for academic purposes.

Reason/s why the Participant May Be Withdrawn from the Study: You are free to withdraw from the study in the case of illness or adverse reactions. There will be no consequences for their withdrawal.

Remuneration: You will not receive any type of remuneration from participating in the research.

Costs of the Study: You will not incur any costs due to the study.

Confidentiality: Participation in this study is confidential and all information will be written in such a manner that you will not be identified. All research material will be kept under the control of the researcher in accordance with the dictates of DUT institutional Research Ethics committee.

Research-related Injury: The research will not involve any procedures which may lead to injury.

Persons to Contact in the Event of Any Problems or Queries:
(Supervisor and details) or Please contact the researcher or the Institutional Research Ethics administrator on 031 373 2375. Complaints can be reported to the Acting Director: Research and Postgraduate Support- Prof E. Napier. Contact number 031 373 2576 or carinn@dut.ac.za

Appendix 2 - Letter of Consent

CONSENT

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number: _____,
- I have also received, read and understood the above written information (Participant Letter of Information) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

_____ _____ _____

Full Name of Participant **Date** **Time** **Signature/**

I, Blessing Machona herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

_____ _____ _____

Full Name of Researcher **Date** **Signature**

_____ _____ _____

Full Name of Witness (If applicable) **Date** **Signature**

_____ _____ _____

Full Name of Legal Guardian **Date** **Signature**

Appendix 3- Letter of Information to Parents

LETTER OF INFORMATION

LETTER OF PARENTAL CONSENT FOR STUDENT ASSENT

Title of the Research Study: *A Systems Approach for enhancing Entrepreneurial Leadership in Learning: A case for Hilbright Science College in Harare and Mutare in Zimbabwe*.

Principal Investigator/s/researcher: – Blessing Machona (MBA. ACIS)
Supervisor/s: (DBA)

Brief Introduction and Purpose of the Study:

Thank you for providing with the opportunity to discuss my research with you.

I am a PhD student registered with the Durban University of Technology. The title of my research is ***A Systems Approach for enhancing Entrepreneurial Leadership in Learning: A case for Hilbright Science College in Harare and Mutare in Zimbabwe.*** The aim of the study is to explore a deeper understanding of Entrepreneurship, Leadership and System Methodologies in learning and how entrepreneurial competencies can be enhanced.

Procedures: I will be recruiting your son/daughter for interviews which will range between 15 to a maximum of 30minutes depending on issues that might want to be probed further. The interviews will be conducted at school at a time that will be convenient to them and the school authorities.

Risks or Discomforts: Your child will unlikely to experience any physical, psychological, or social risks, however should you feel uncomfortable or experience any problems due to your participation in this research, you may withdraw anytime without prejudice.

Benefits: There may be no direct benefits to your child through their participation in this project. However, the outcome of this study might be of benefit to future students, yourself, and both the business and academic communities. It is also important to point out that there will be no benefits for the researcher beyond the gratification of completing the research for academic purposes.
Reason/s why the Participant May Be Withdrawn from the Study: Your child is free to withdraw from the study in the case of illness or adverse reactions. There will be no consequences for their withdrawal.

Remuneration: Your child will not receive any type of remuneration from participating in the research.

Costs of the Study: You will not incur any costs due to the study.

Confidentiality: Participation in this study is confidential and all information will be written in such a manner that your child will not be identified. All research material will be kept under the control of the researcher in accordance with the dictates of DUT institutional Research Ethics committee.

Research-related Injury: The research will not involve any procedures which may lead to injury.

Persons to Contact in the Event of Any Problems or Queries:
(Supervisor and details) or Please contact the researcher, or the Institutional Research Ethics administrator on 031 373 2375. Complaints can be reported to the Acting Director: Research and Postgraduate Support- Prof E. Napier. Contact number 031 373 2576 or carinn@dut.ac.za

Appendix 4 - Letter of Information to Administrators/Teachers/ Entrepreneurs/Ministry

LETTER OF INFORMATION

Title of the Research Study: *A Systems Approach for enhancing Entrepreneurial Leadership in Learning: A case for Hilbright Science College in Harare and Mutare in Zimbabwe*.

Principal Investigator/s/researcher: Blessing Machona (MBA. ACIS)

Supervisor/s: Dr. Stan Hardman (DBA)

Brief Introduction and Purpose of the Study:
Thank you for providing with the opportunity to discuss my research with you.

I am a PhD student registered with the Durban University of Technology. The title of my research is *A Systems Approach for enhancing Entrepreneurial Leadership in Learning: A case for Hilbright Science College in Harare and Mutare in Zimbabwe."* The aim of the study is to explore a deeper understanding of Entrepreneurship, Leadership and System Methodologies in learning and how entrepreneurial competencies can be enhanced.

Procedures: I will be collecting information by means of semi structured interviews from you which will range between 15 to a maximum of 30minutes depending on issues that might want to be probed further. The interviews will be conducted at your work place at a time that will be convenient to you.

Risks or Discomforts: You will unlikely to experience any physical, psychological, or social risks, however should you feel uncomfortable or experience any problems due to your participation in this research, you may withdraw anytime without prejudice.

Benefits: There may be no direct benefits to you through your participation in this project. However, the outcome of this study might be of benefit to future students, yourself, and both the business and academic communities. It is also important to point out that there will be no benefits for the researcher beyond the gratification of completing the research for academic purposes.

Reason/s why the Participant May Be Withdrawn from the Study: You are free to withdraw from the study in the case of illness or adverse reactions. There will be no consequences for their withdrawal.

Remuneration: You will not receive any type of remuneration from participating in the research.

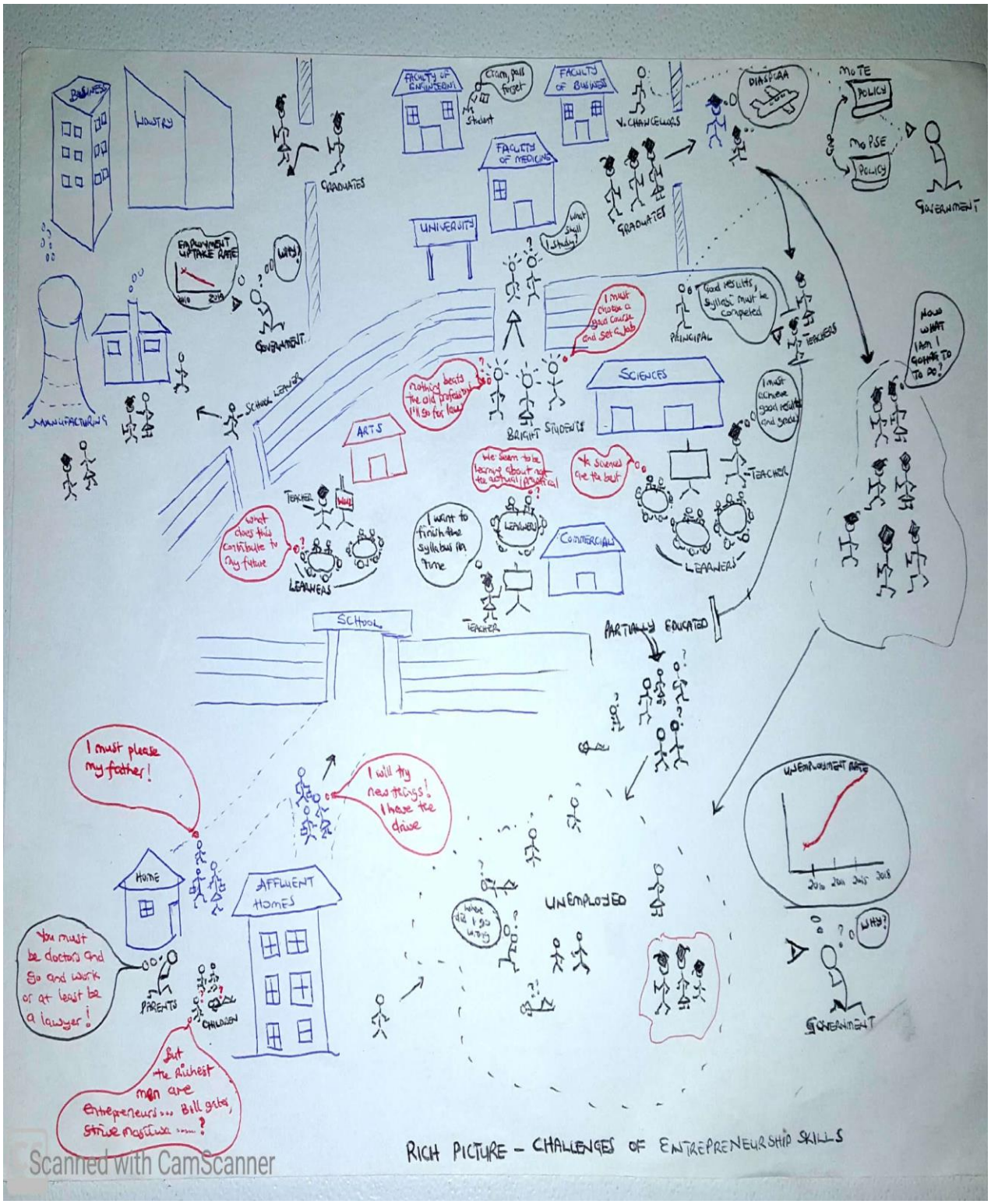
Costs of the Study: You will not incur any costs due to the study.

Confidentiality: Participation in this study is confidential and all information will be written in such a manner that you will not be identified. All research material will be kept under the control of the researcher in accordance with the dictates of DUT institutional Research Ethics committee.

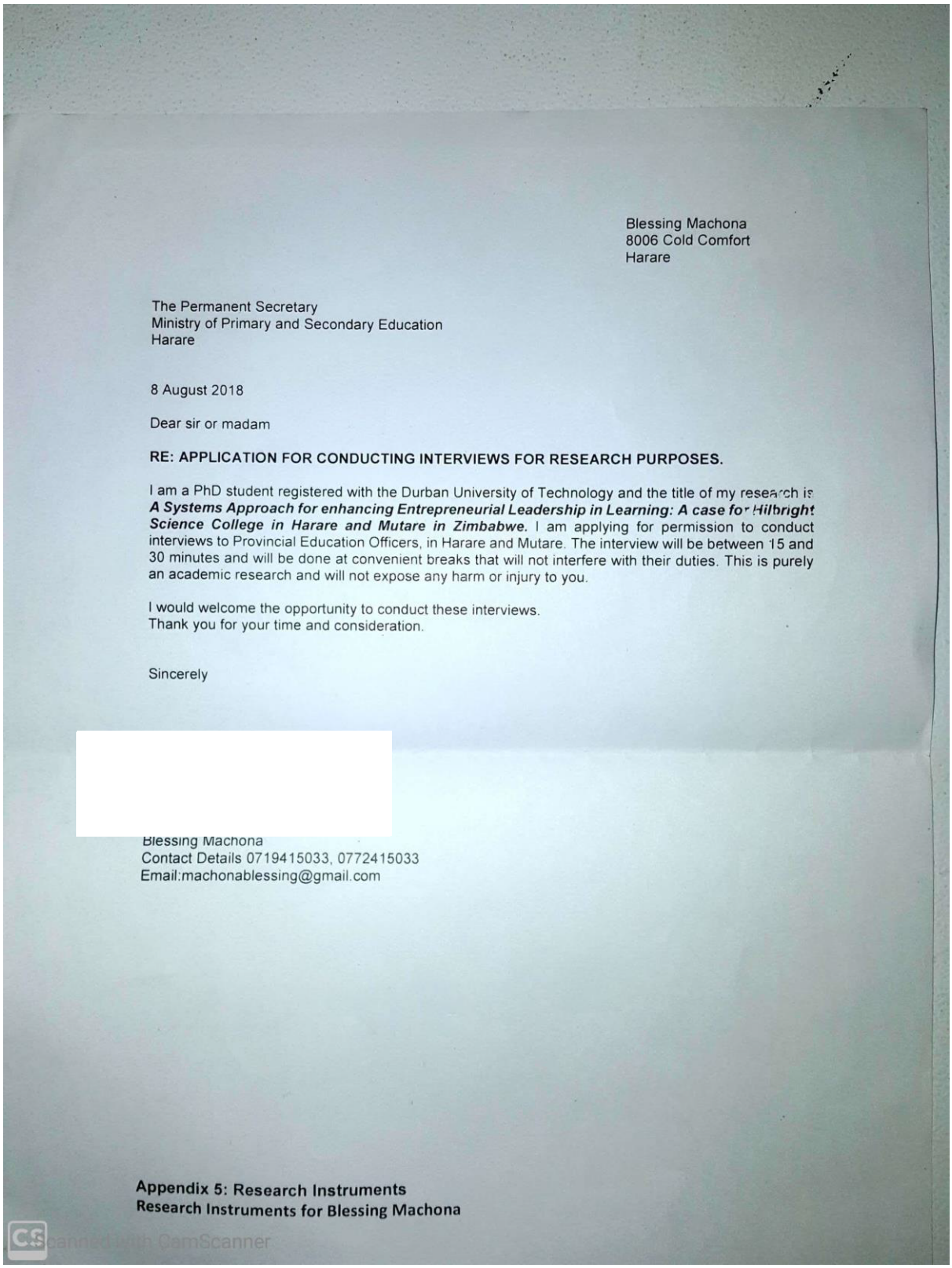
Research-related Injury: The research will not involve any procedures which may lead to injury.

Persons to Contact in the Event of Any Problems or Queries:
(Supervisor and details) or Please contact the researcher), or the Institutional Research Ethics administrator on 031 373 2375. Complaints can be reported to the Acting Director: Research and Postgraduate Support- Prof E. Napier. Contact number 031 373 2576 or carinn@dut.ac.za

Appendix 5 - Rich Picture



Appendix 6 - Application for authorisation of study



Blessing Machona
8006 Cold Comfort
Harare

The Permanent Secretary
Ministry of Primary and Secondary Education
Harare

8 August 2018

Dear sir or madam

RE: APPLICATION FOR CONDUCTING INTERVIEWS FOR RESEARCH PURPOSES.

I am a PhD student registered with the Durban University of Technology and the title of my research is ***A Systems Approach for enhancing Entrepreneurial Leadership in Learning: A case for Hilbright Science College in Harare and Mutare in Zimbabwe.*** I am applying for permission to conduct interviews to Provincial Education Officers, in Harare and Mutare. The interview will be between 15 and 30 minutes and will be done at convenient breaks that will not interfere with their duties. This is purely an academic research and will not expose any harm or injury to you.

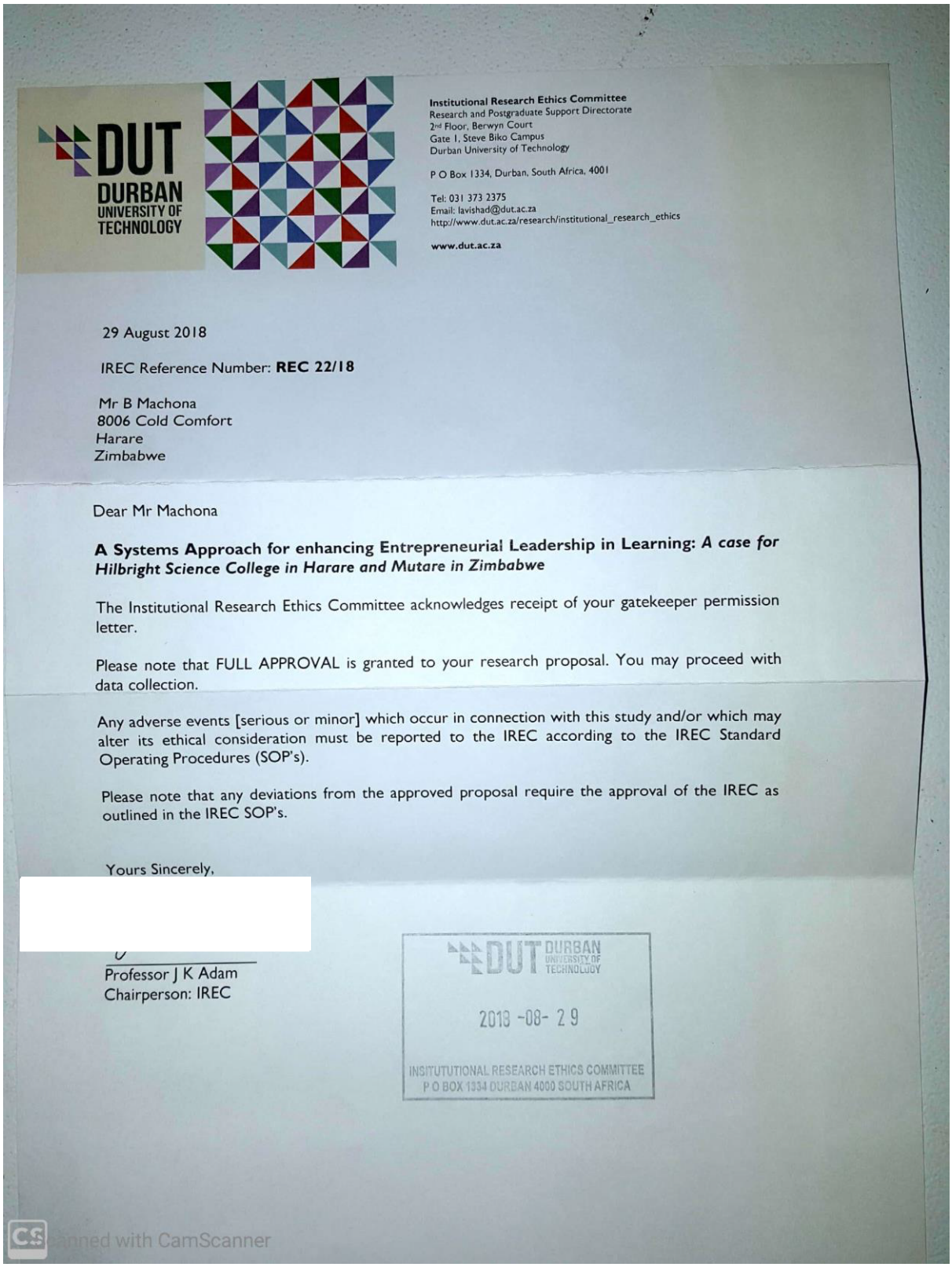
I would welcome the opportunity to conduct these interviews.
Thank you for your time and consideration.

Sincerely

Blessing Machona
Contact Details 0719415033, 0772415033
Email:machonablessing@gmail.com

Appendix 5: Research Instruments
Research Instruments for Blessing Machona

Appendix 7 - Ethical Clearance letter



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DURBAN UNIVERSITY OF TECHNOLOGY

Institutional Research Ethics Committee
Research and Postgraduate Support Directorate
2nd Floor, Berwyn Court
Gate 1, Steve Biko Campus
Durban University of Technology

P O Box 1334, Durban, South Africa, 4001

Tel: 031 373 2375
Email: lavishad@dut.ac.za
http://www.dut.ac.za/research/institutional_research_ethics

www.dut.ac.za

29 August 2018

IREC Reference Number: **REC 22/18**

Mr B Machona
8006 Cold Comfort
Harare
Zimbabwe

Dear Mr Machona

A Systems Approach for enhancing Entrepreneurial Leadership in Learning: *A case for Hilbright Science College in Harare and Mutare in Zimbabwe*

The Institutional Research Ethics Committee acknowledges receipt of your gatekeeper permission letter.

Please note that FULL APPROVAL is granted to your research proposal. You may proceed with data collection.

Any adverse events [serious or minor] which occur in connection with this study and/or which may alter its ethical consideration must be reported to the IREC according to the IREC Standard Operating Procedures (SOP's).

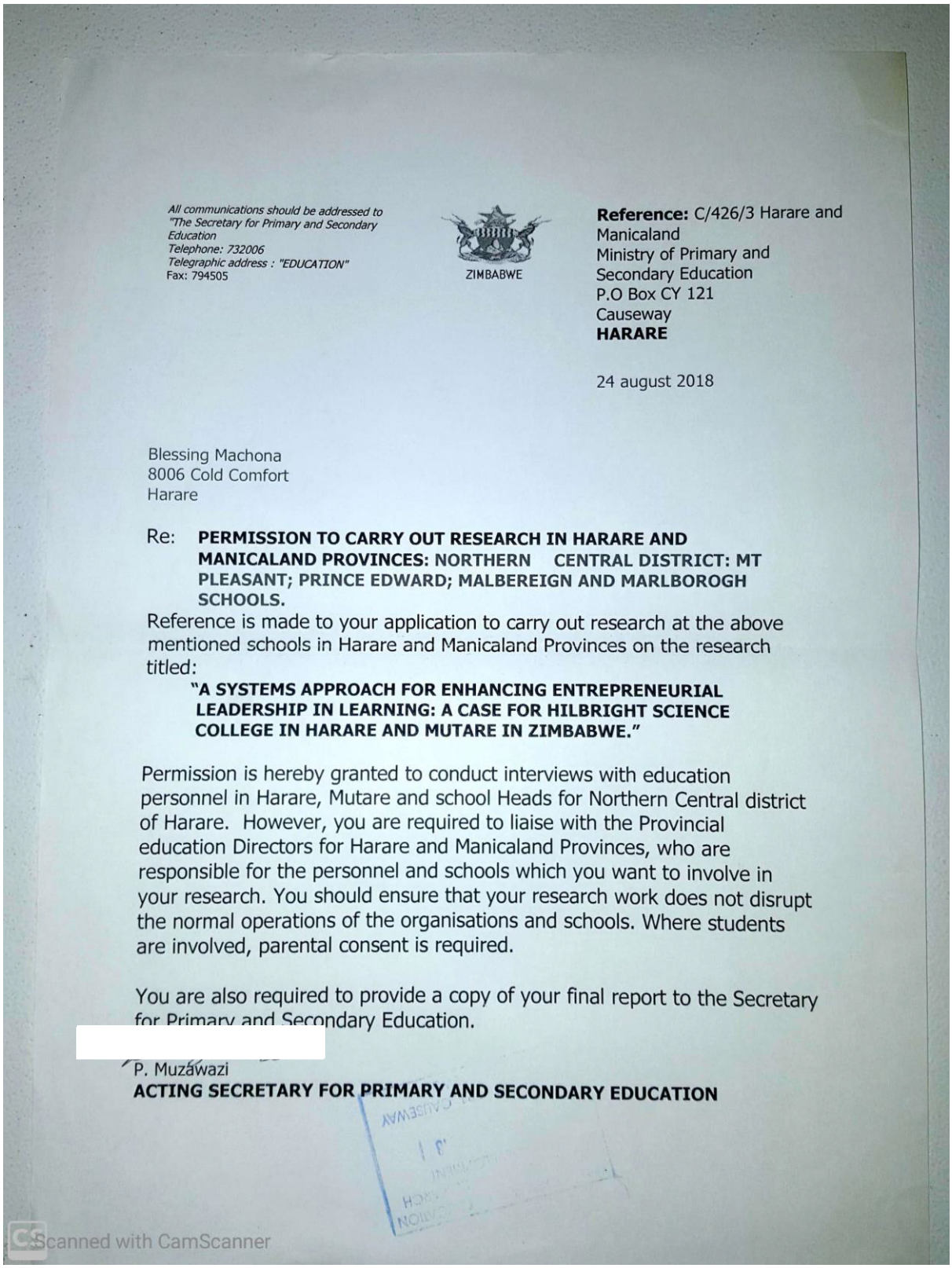
Please note that any deviations from the approved proposal require the approval of the IREC as outlined in the IREC SOP's.

Yours Sincerely,

Professor J K Adam
Chairperson: IREC

DUT DURBAN UNIVERSITY OF TECHNOLOGY
2013 -08- 29
INSITUTUTIONAL RESEARCH ETHICS COMMITTEE
P O BOX 1334 DURBAN 4000 SOUTH AFRICA

Appendix 8 - Gate keepers' letter- Ministry of Primary and Secondary Education



All communications should be addressed to "The Secretary for Primary and Secondary Education
Telephone: 732006
Telegraphic address : "EDUCATION"
Fax: 794505

ZIMBABWE

Reference: C/426/3 Harare and Manicaland
Ministry of Primary and Secondary Education
P.O Box CY 121
Causeway
HARARE

24 august 2018

Blessing Machona
8006 Cold Comfort
Harare

Re: **PERMISSION TO CARRY OUT RESEARCH IN HARARE AND MANICALAND PROVINCES: NORTHERN CENTRAL DISTRICT: MT PLEASANT; PRINCE EDWARD; MALBEREIGN AND MARLBOROGH SCHOOLS.**

Reference is made to your application to carry out research at the above mentioned schools in Harare and Manicaland Provinces on the research titled:

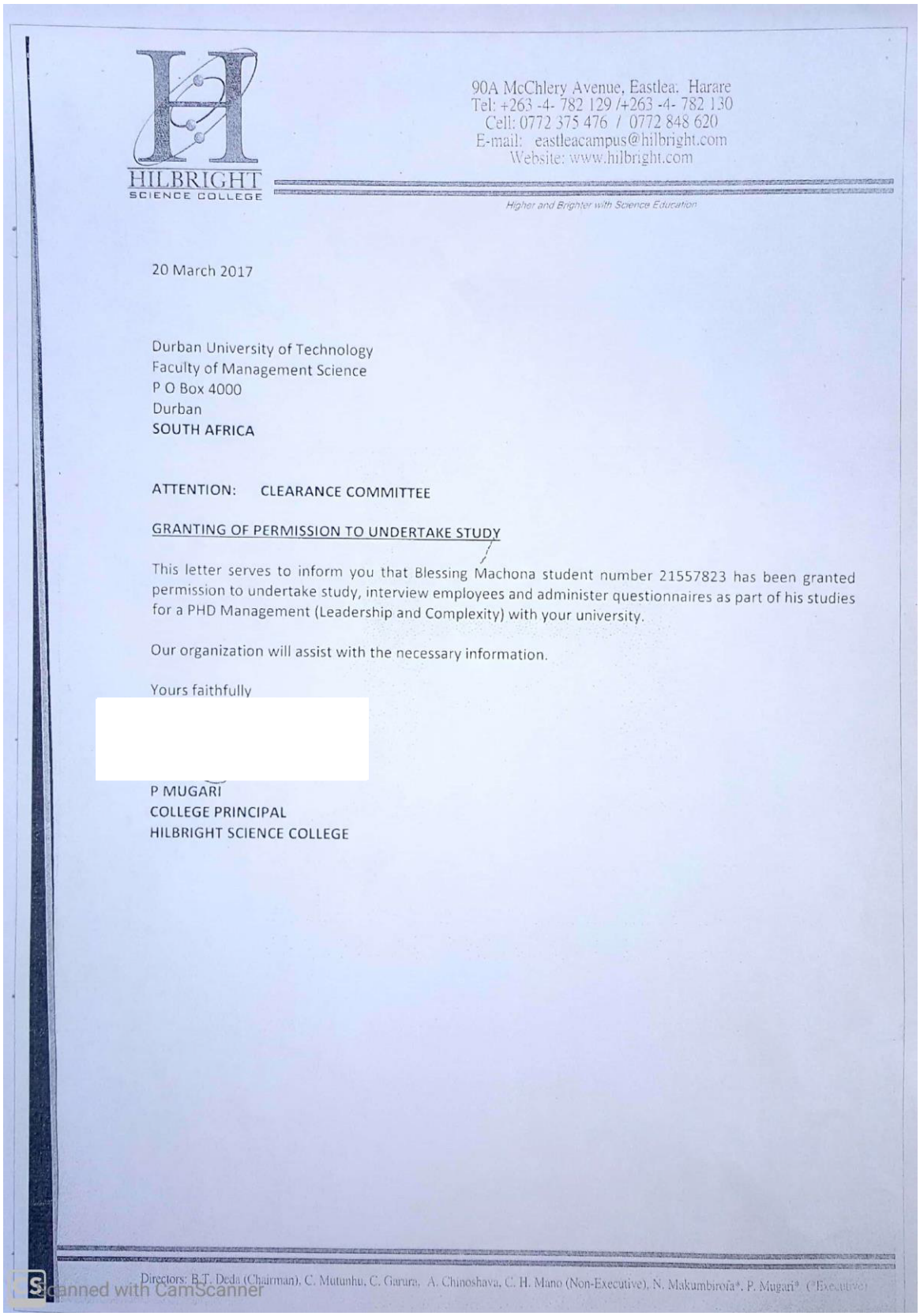
"A SYSTEMS APPROACH FOR ENHANCING ENTREPRENEURIAL LEADERSHIP IN LEARNING: A CASE FOR HILBRIGHT SCIENCE COLLEGE IN HARARE AND MUTARE IN ZIMBABWE."

Permission is hereby granted to conduct interviews with education personnel in Harare, Mutare and school Heads for Northern Central district of Harare. However, you are required to liaise with the Provincial education Directors for Harare and Manicaland Provinces, who are responsible for the personnel and schools which you want to involve in your research. You should ensure that your research work does not disrupt the normal operations of the organisations and schools. Where students are involved, parental consent is required.

You are also required to provide a copy of your final report to the Secretary for Primary and Secondary Education.

P. Muzawazi
ACTING SECRETARY FOR PRIMARY AND SECONDARY EDUCATION

Appendix 9 - Gate keepers' letter- Hilbright Science College



HILBRIGHT
SCIENCE COLLEGE

90A McChlery Avenue, Eastlea. Harare
Tel: +263 -4- 782 129 /+263 -4- 782 130
Cell: 0772 375 476 / 0772 848 620
E-mail: eastleacampus@hilbright.com
Website: www.hilbright.com

Higher and Brighter with Science Education

20 March 2017

Durban University of Technology
Faculty of Management Science
P O Box 4000
Durban
SOUTH AFRICA

ATTENTION: CLEARANCE COMMITTEE

GRANTING OF PERMISSION TO UNDERTAKE STUDY

This letter serves to inform you that Blessing Machona student number 21557823 has been granted permission to undertake study, interview employees and administer questionnaires as part of his studies for a PHD Management (Leadership and Complexity) with your university.

Our organization will assist with the necessary information.

Yours faithfully

P MUGARI
COLLEGE PRINCIPAL
HILBRIGHT SCIENCE COLLEGE

Appendix 10 - Knowledge Café Guide

Problem statement

Students who graduate or leave school seem to be ill prepared for life in an ever changing world. They seem to lack both entrepreneurial and leadership skills.

Question 1: Why is it so? List the reasons that causes the problem.

Question 2: How are the challenges related?

Represent them in (a) spray diagram

b) Rich picture format as per briefing.

After seeing the interrelated of issues what lessons did you learn?

Question 3: Do you thinking seeing issues and how they are related is an important skill to be taught to students (Give advantages)

Question 4: How can we can we make entrepreneurship and leadership core skills in teaching and learning. List the possible changes that must be done in order to achieve this entrepreneurial thinking?

Possible areas of transformation may include the following areas:

1. Policy and curricula.
2. Internal dynamics in the education systems.
3. Rules in education system.
4. Teaching and learning process.
5. World views or mental models
6. Beliefs
7. Culture
8. Values
9. Goals.
10. Other related areas

Question 5: For a school like Hilbright that specializes in Sciences and seem to neglect Entrepreneurial thinking what are your recommendations?

Question 6: Discuss the conditions that you think will be necessary in improving this entrepreneurial leadership thinking and skills?

Activity 2:

If you were asked to create systems to promote entrepreneurial leadership skills in a school set up what systems would you propose?

Guide

System 1

A system to do (the transformation intended)

……
……..……..

Through

(How)……
……..

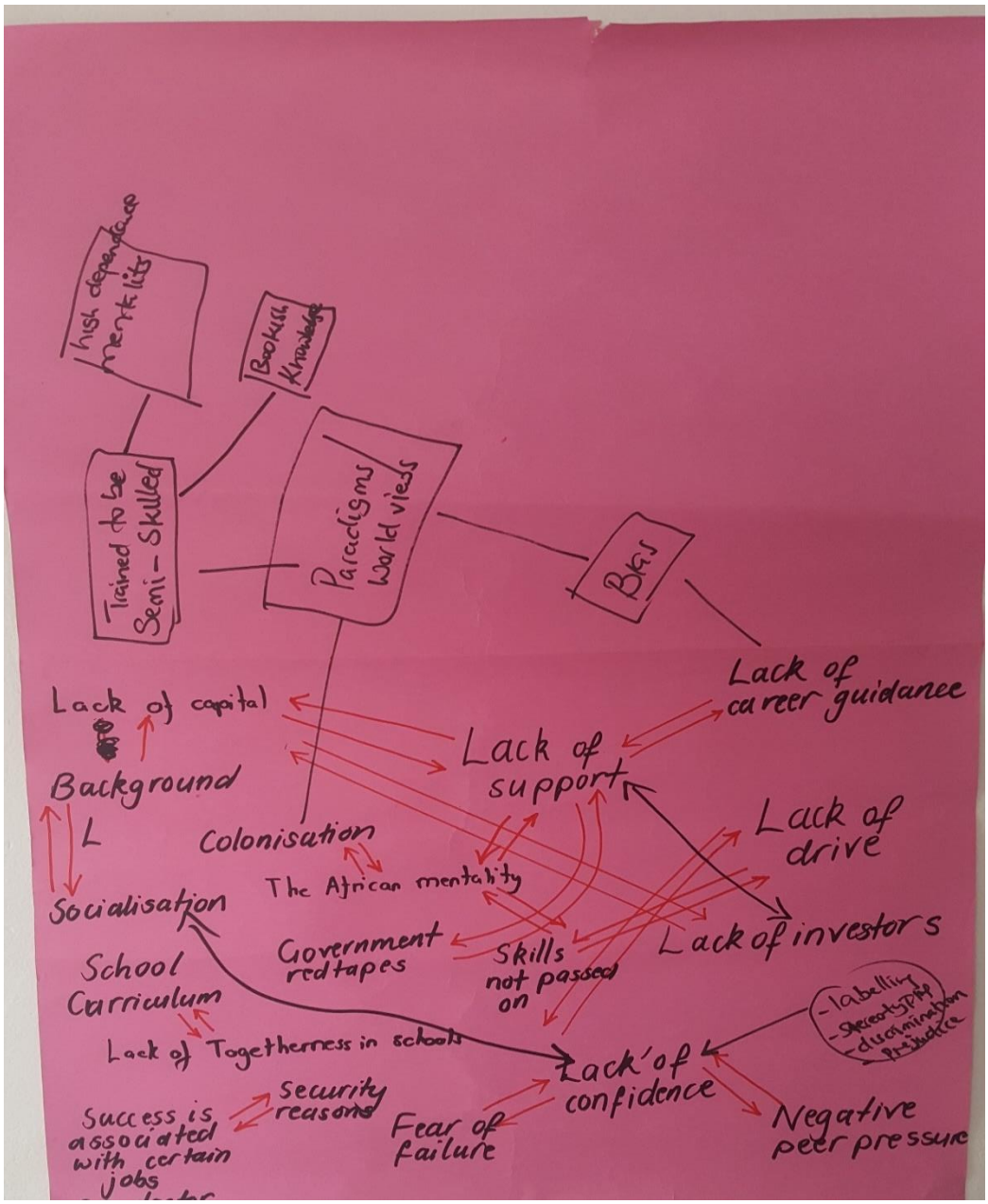
In order to

……
…….

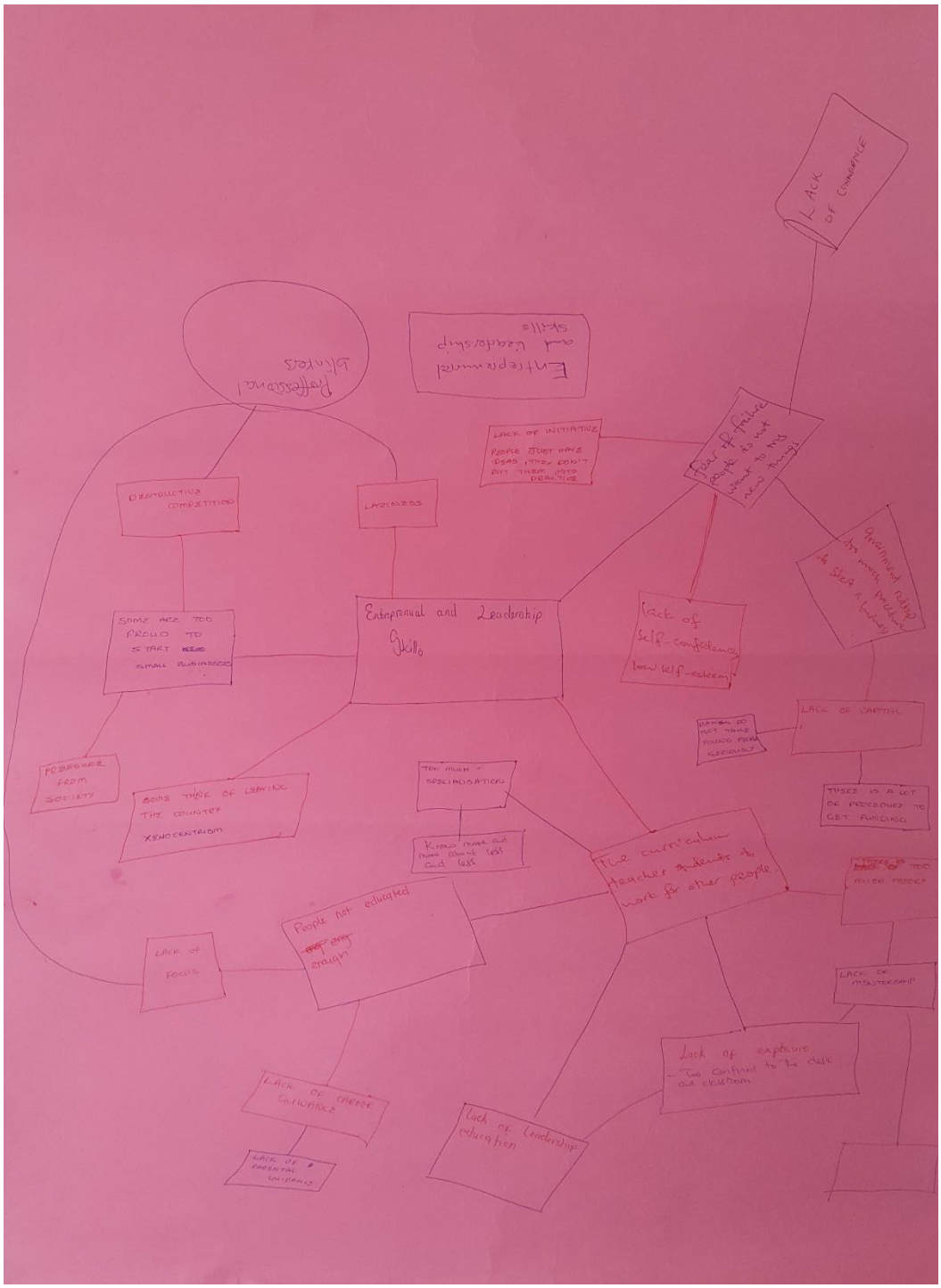
Related Activities in order to achieve the system

……
……
……
……
……
……

Appendix 11 - Thematic sketches of focus groups



Appendix 12 - Focus group Annotation



A SYSTEMS APPROACH FOR ENHANCING ENTREPRENEURIAL LEADERSHIP IN LEARNING FOR ZIMBABWE:THE CASE FOR HILBRIGHT SCIENCE COLLEGE IN HARARE AND MUTARE

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