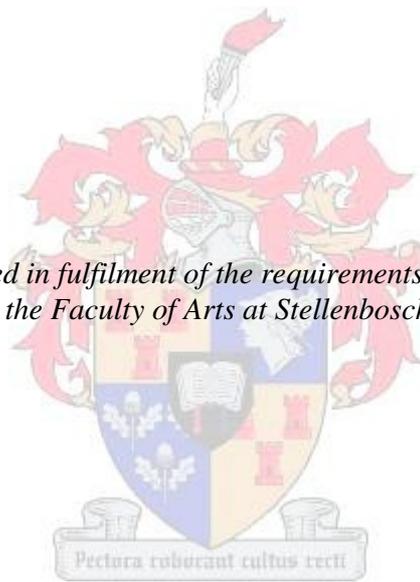


Identity formation: a key to transforming teaching and learning

by
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Declaration

By submitting this thesis, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

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Abstract

This paper proposes a possible solution to the current state of education in South African public schools, notably the underperforming schools. It uses various international studies, namely the Progress in International Reading Literacy Study (PIRLS), the 2003 Third International Maths and Science Study (TIMSS), the Southern and Eastern African Consortium for Monitoring Education Quality (SACMEQ), as well as the matriculation results to explore the reality of the education crisis as a poverty trap. I then explore possible reasons for the failure of the basic education system by means of the 'Four As' of the International Committee for Economic, Social and Cultural rights as a starting point to measure basic education. The 'Four As' (Woolman and Bishop, 2012:57-19 to 57-32) are *Availability/Adequacy*, *Accessibility*, *Acceptability* and *Adaptability*. I propose identity formation within a framework of complexity thinking as an approach to the problems in the underperforming system, especially the problems arising from education not meeting the criteria of the 'Four As', and in particular because education is a determining factor in social justice. Complexity thinking is inseparable from the ethics of complexity, just as identity formation cannot be separated from the ethics and politics of identity. Finally, the insights are applied to the purpose of teaching and learning, in terms of complexity thinking and identity formation, and in terms of the National Development Plan. The latter is the policy document shaping the future of teaching and learning, amongst others, in South Africa. This is followed by an assessment of the National Development Plan in the light of the requirements of the 'Four As'.

Abstrak

Hierdie skryfstuk stel 'n moontlike oplossing voor vir die huidige stand van onderwys in Suid-Afrikaanse publieke skole, veral die onderpresterende skole. Dit gebruik verskeie internasionale studies, naamlik die 'Progress in International Reading Literacy Study (PIRLS)', die '2003 Third International Maths and Science Study (TIMMS)', die 'Southern and Eastern African Consortium for Monitoring Education Quality (SACMEQ)', asook die matriekuitslae, om die realiteit van onderwys as 'n put van armoede te ondersoek. Voorts ondersoek ek moontlike redes vir die mislukking van die basiese onderwyssisteem. Dit word gedoen aan die hand van die sogenaamde 'Four As' van die Internasionale Komitee vir Ekonomiese, Sosiale en Kulturele regte. Die 'Four As', soos vervat deur Woolman en Bishop (2012:57-19 tot 57-32) is, in Engels: 'Availability/Adequacy, Accessibility, Acceptability' en 'Adaptability'. Dit kan vertaal word as Beskikbaarheid/Voldoendenheid, Toeganklikheid, Aanvaarbaarheid en Aanpasbaarheid. Ek stel identiteitsvorming binne 'n raamwerk van kompleksiteitsdenke voor as 'n benadering tot die probleme in die onderpresterende onderwyssisteem, veral die probleme wat voortspruit uit onderwys wat nie aan die kriteria van die 'Four As' voldoen nie. Dit word gedoen omdat onderwys by uitstek 'n bepalende faktor in sosiale geregtigheid is. Kompleksiteitsdenke is onafskeidbaar van die etiek van kompleksiteit, net soos identiteitsvorming onlosmaaklik deel is van die etiek en politiek van identiteit. Laastens, word die insigte toegepas op die doel van onderrig en leer, in terme van kompleksiteitsdenke en identiteitsvorming, en in terme van die Nasionale Ontwikkelingsplan. Laasgenoemde is 'n beleidsdokument wat rigting tot 2030 verleen aan, onder andere, onderrig en leer, in Suid-Afrika. Dit word gevolg deur 'n evaluering van die Nasionale Ontwikkelingsplan aan die hand van die vereistes van die 'Four As'.

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For enabling my journey into the unknown:

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The communities of Victoria Girls' High School and Ntsika Secondary School

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Contents

Identity formation: a key to transforming teaching and learning	i
Declaration	ii
Abstract	iii
Abstrak	iv
Acknowledgements	v
Contents	vi
Chapter 1: Introduction	8
Chapter 2: Public education in a South African underperforming school	15
2.1 INTRODUCTION.....	15
2.2 HOW DO SOUTH AFRICAN SCHOOLS FARE?	17
2.2.1 The Progress in International Reading Literacy Study (PIRLS)	17
2.2.2 The Third International Maths and Science Study (TIMMS)	20
2.2.3 The Southern and Eastern African Consortium for Monitoring Education Quality	20
2.2.4 Matric results (National Senior Certificate)	21
2.3 POOR QUALITY EDUCATION AS A POVERTY TRAP	23
2.4 SUGGESTED REASONS FOR THE UNDERPERFORMANCE	25
2.4.1 Availability/Adequacy	25
2.4.2 Accessibility	38
2.4.3 Acceptability.....	46
2.4.4 Adaptability.....	49
2.5 A POSSIBLE SOLUTION: COMPLEXITY THINKING AND IDENTITY FORMATION	54
Chapter 3: Complexity Thinking and Identity	56
3.1 INTRODUCTION.....	56
3.1.1 Context.....	56
3.1.2 Chapter structure.....	56
3.2 COMPLEXITY.....	57
3.2.1 What is complexity thinking?.....	57
3.2.2 Defining complex systems.....	60
3.2.3 Complexity and ethics	72
3.3 IDENTITY.....	78
3.3.1 Identity and complexity	78
3.3.2 The ethics and politics of identity	80
3.4 CONCLUSION.....	93

Chapter 4: Application	95
4.1 INTRODUCTION.....	95
4.1.1 Context.....	95
4.1.2 Chapter structure.....	95
4.2 THE PURPOSE OF TEACHING AND LEARNING.....	96
4.2.1 Teaching and learning in terms of complexity thinking and identity formation	96
4.2.2 Teaching and learning, in terms of the NDP	98
4.3 COMPLEXITY THINKING, IDENTITY FORMATION &THE NDP, IN TERMS OF THE 'FOUR As'	99
4.3.1 Availability / Adequacy	99
4.3.2 Accessibility.....	104
4.3.3 Acceptability.....	108
4.3.4 Adaptability.....	112
4.4 CONCLUSION.....	118
References	121

Chapter 1: Introduction¹

The preamble to the *South African Schools Act 84 of 1996* states that:

WHEREAS the achievement of democracy in South Africa has consigned to history the past system of education which was based on racial inequality and segregation; and

WHEREAS this country requires a new national system for schools which will redress past injustices in educational provision, provide an education of progressively high quality for all learners and in so doing lay a strong foundation for the development of all our people's talents and capabilities, advance the democratic transformation of society, combat racism and sexism and all other forms of unfair discrimination and intolerance, contribute to the eradication of poverty and economic well-being of society, protect and advance our diverse cultures and language, uphold the rights of all learners, parents and educators, and promote their acceptance of responsibility for the organisation, governance and funding of schools in partnership with the State[...]

...Fleisch (2008) says

South Africa has not one, but two educational systems. The first 'system' is well resourced, consisting mainly of former white and Indian schools, and a small but growing independent sector. The first 'system' produces the majority of university entrants and graduates, the vast majority of students graduating with higher grade mathematics and science. Enrolling the children of the elite, white-middle and new black middle classes, the first system does a good job of ensuring that most children in its charge acquire literacy and mathematics competences that are comparable to those of middle-class children anywhere in the world. The second school 'system' enrolls the vast majority of working-class and poor children ... in seven years of schooling, children in the second system do learn, but acquire a much more restricted set of knowledge and skills than children in the first system. They 'read', but mostly at very limited functional level; they 'write', but not with fluency or confidence. They

¹ D Mackintosh (2012) is acknowledged for the idea for the introductory page.

can perform basic numeric operations but use inappropriately concrete techniques that limit application.

Nineteen years into democracy, and we have the ideal and the reality. South African public school education is widely accepted to be in crisis. It appears not to be delivering on the promises contained in the Constitution of South Africa, nor on the provisions of relevant legislation.

Yet, despite the outcry by academics or organisations such as Equal Education, and despite service delivery protest being the order of the day in South Africa, reports of grassroots level dissatisfaction with the ‘service delivery’ of teaching and learning are noticeably few. Everatt, (2010:75) refers to a baseline study undertaken in 2006, with a follow up in 2008, to measure the opinion of the poor in terms of service access and quality. An unexpected finding was that ‘in the midst of the challenges facing them [the poor], they have singled out education as by some margin, government’s most successfully delivered service’ (76).

The reason for the lack of outcry from those directly affected, that is, the poor, lies in the two systems that Fleisch refers to above. The poor are used to promises and accept their ‘fate’ with an attitude of meritocracy, as Reay (2003:59) puts it, ‘Experiences are individualised in a process in which setbacks and crises are viewed as personal failure even when they are connected to processes beyond the individual’s control’.

The children of the middle class attend schools in the polar opposite system; they are the privileged few who were never trapped by poverty, or who managed to escape from it, through good fortune or through symbolic violence, that is, violence embedded in everyday life, through misrecognition, through complicity and by consent (Morgan and Bjorkert, 2006:441). Included in this group are the children of township teachers, and the children of politicians, in other words, of the powerful, who can and should make an enabling difference to the teaching and learning of the poor. A generalised view is that those in and connected to the better schools do not see the township schools as their problem. This disengagement appears to hold true for the township teacher, too.

Where there is an awareness of the iniquitous situation, blame is apportioned mainly to the teachers (‘lazy and poorly qualified’), the administrative centres of education, such as the district offices (‘lazy and ineffective’), the unions (‘destructive, against child’). Professor

Jansen, vice-chancellor of the University of the Free State frequently expresses his criticism of SADTU, the South African Democratic Teachers' Union,

He was furious over SADTU's on-going strikes and the go-slow that has affected schools across the country. "It is immoral for our union leaders to disrupt schools for the vast number of poor children in our country, while their children attend schools which are undisturbed."²

Blame is also apportioned to the leadership of schools and offices ('the rot starts at the top', as stated by Ngonzo (Carlisle, 2013), Superintendent General of the Department of Basic Education of the Eastern Cape. The unions, depending on which side of the political spectrum they sit, blame The South African Democratic Teachers' Union, (SADTU), and SADTU blames government, but still supports government through the Congress of South African Trade Unions (COSATU), as reported by Nicolson in the Daily Maverick, and calls for the use of learners as political capital,

S[ADTU] has announced its support for the ANC in the 2014 elections. "All S[ADTU] members should take part in the alliance campaigns canvassing for the decisive two-thirds majority victory for ANC," the union resolved. "All structures of S[ADTU] should engage in educating learners about the history of our country as part of the preparations for the 2014 elections." The Sunday Independent reported that Maluleke said the union must support the ANC's campaign for youth votes because "as teachers we are uniquely positioned to influence these minds"³.

The question that arises is whether the criticism, on the one hand, or the apparent satisfaction of the poor with the delivery of education, on the other hand, is justified. In chapter 2, the outcomes of various international studies, as well as the matric results, are discussed. This is followed by an investigation of the concept that poor quality education is a poverty trap. The conclusion is that the poor should not be satisfied with the inequitable education their children are receiving, especially as quality teaching and learning are regarded as a passport out of poverty. On the other hand, neither should the privileged few rest comfortably.

² <http://www.acceleratecapetown.co.za/news/jonathan-jansen-calls-for-leadership-and-new-leadership-styles/#sthash.D5fTsWVQ.dpuf> Downloaded 31 October 2013

³ <http://www.dailymaverick.co.za/article/2013-10-28-sadtu-teaching-and-politics-in-a-time-of-division/#.UnMw4I0aLVI> 28 October 2013

The parlous state of affairs can only be addressed if the reasons for the failures are interrogated. This is done by means of the 'Four As' of the International Committee for Economic, Social and Cultural rights, as stated by Woolman and Bishop, (2012:57-19 to 57-32). The 'Four As' are *Availability / Adequacy, Accessibility, Acceptability and Adaptability*.

Availability / Adequacy is discussed in terms of school funding and staff, specifically subject specific teacher training, and the mental and physical absenteeism of teachers. The second 'A', *Accessibility*, is found wanting in terms of physical access, epistemological access and financial access. This is followed by a discussion of *Acceptability* which means an acceptable education directed at the development of human potential, development with dignity, without denying the child his/her human rights, in an equal and discrimination free environment. Through an acceptable education, and through being accepted by others, learners' and teachers' sense of self is constituted. An enabling sense of belonging emerges through an acceptable education. This is an important point, as Swartz, Harding and De Lannoy, (2012:28), point out, disabling circumstances and hopelessness are conducive to an *ikasi-style* sense of belonging, where *ikasi-style* refers to the rationalisation of behaviour that would not normally be socially acceptable. Examples of such behaviour becoming markers of belonging, are violence, fashion and music (ibid).

The fourth 'A', *Adaptability*, refers to the ability of the education system to adapt to the needs of society, without compromising the rights of the individual. It is questioned whether the current human capital approach, in other words, an education to feed the economy, recognises the social value of a person.

Adaptability of the education system is measured by the contents of the curricula, and by the intervention strategies employed to address problems which are identified through an evidence-based approach. To gather evidence, assessment practices and outcomes are studied. The South African public school system has seen umpteen interventions and curricula changes since 1994. While change was necessary, the section on *Acceptability* concludes that change was too fast for the environment and for the stakeholders. Cilliers (2006:105) warns against 'unreflective speed' when attempts are made to effect change in a complex system. He says (106),

a system that has carefully accumulated the relevant memories and experiences over time will be in a better position to react quickly than one that is perpetually jumping from one state to the other.

Democratic South Africa inherited 15 disparate and unequal education systems. Change had to happen, but it would appear that the ‘carefully accumulated [~~the~~] relevant memories and experiences’ were not necessarily to the advantage of transformation. After 19 years, old disabling practices are still self-organising parts of the education system into conditions in which quality teaching and learning cannot take place.

Chapter 2 concludes that, based on relevant research outcomes, education is indeed in crisis. It has not been transformed as poor quality education remains a poverty trap. There is no social justice in or through education. The reasons for the failure lie in an education system that is not available/adequate, accessible, acceptable and adaptable. The interventions fail because cognisance is not taken of the complexity of the education system, nor of the ethics implicit in the choices being made. Sufficient attention is not given to the relationship between human systems, or between systems and the environment, in other words, to identity formation where identity is understood to be emerging meaning and consciousness in relationships of difference. It will also be argued that insufficient consideration is given to the inter-relationship between identity and social justice. Identity is embedded in social conditions and is pivotal to social transformation and justice. It has political and ethical implications with asymmetrical power relations enabling or disabling identity formation. Identity formation, in turn, informs or is informed by discursive practices, knowledge and knowledge creation, and social justice.

Cilliers’ advises that due to the complexity of education, change in a school cannot take place unless environmental change precedes it. He (ibid) calls for ‘[s]low schooling’ which ‘emphasizes the contextual nature of knowledge and reminds us that education is a process not a function’ (105). We need to reflect on education as a process, and on the environmental change needed to effect that process. In order to reflect, we need an awareness of the complexity of the problem, in other words, we need consciousness that emerges in enabling relationships.

Following Davis, Sumara and Iftody’s assertions (2010:109), consciousness is a process, it is everywhere and nowhere and it is an inter-subjective phenomenon. In terms of consciousness being a process, they concur that the sense of self a system has, is an emergent property of the brain and enculturation. Culture, therefore plays a significant role in the developing of consciousness. Consciousness is everywhere and nowhere in that it is not centred in the

brain, or as Davis *et al* (2010:110) say, ‘it is a symbiotic by-product of the complex interweaving of the biological self with the largely invisible cultural symbolic web’. Moreover, consciousness is an inter-subjective phenomenon as it becomes in relation to the other; it is being shaped by our enculturation, and by our ability to put ourselves in the shoes of the other. The latter refers to our empathy, where empathy means to try to understand another person by imagining how that person perceives one. Empathy is a dissolving of ego boundaries (117). Without identity being formed continuously as morally competent beings, critical consciousness does not emerge; without consciousness, empathy does not emerge.

Notshulwana, Executive Dean of Arts at Nelson Mandela Metropolitan University, (2012:26), says, the greater the consciousness, the higher is the expression of one’s humanity. The concept of Ubuntu, *Umntu ngumntu ngabantu*, I am a person because of other persons, comes to mind. I am what and who I am because of what emerges in the spaces between us, in the localised interactions. For this reason chapter 3 is a detailed account of complexity thinking and the ethics thereof, of identity formation and complexity, of the ethics and politics of identity formation, and of identity and social justice.

Chapter 4 is introduced by a reflection on the purpose of teaching and learning, in terms of complexity thinking and identity formation, followed by the purpose of teaching and learning according to the NDP. The insights are then applied to the National Development Plan (2011), a policy document that shapes the direction education will take until 2030. The application draws the following conclusions: teaching and learning should become spaces for emergence of knowledge and skills, of socialisation and of coming into presence of unique human beings (Biesta, quoted by Gough, 2010:48). This is a complex process, a journey into the unknown (Trueit and Doll, 2010:138), that is undertaken in relationships. It requires availability/adequacy, accessibility, acceptability and adaptability, framed in complexity thinking so that a spirit of ‘moreness,’ as the source of hope, (136), can emerge. ‘Moreness’ is the awareness and understanding that there is ‘more’ than what is being experienced in and through teaching and learning. This awareness can lead to hope. Teaching and learning in South African public schools can be transformed, if approaches are framed in complexity thinking and ethical choices are enabled through identity formation.

Through the emergent process of identity formation, our narratives will be interwoven into a tapestry, (Woermann, 2010:216), that reflects a just society in which education, true to the

preamble of the *South African Schools Act 84 of 1996*, and without Fleisch's (2008) observation:

Redress[es] past injustices in educational provision, provide[s] an education of progressively high quality for all learners and in so doing lay a strong foundation for the development of all our people's talents and capabilities, advance[s] the democratic transformation of society, combat[s] racism and sexism and all other forms of unfair discrimination and intolerance, contribute[s] to the eradication of poverty and economic well-being of society, protect[s] and advance[s] our diverse cultures and language, uphold[s] the rights of all learners, parents and educators, and promote[s] their acceptance of responsibility for the organisation, governance and funding of schools in partnership with the State.

This is not an impossible dream, nor wishful thinking, if we take our responsibility to be morally competent beings seriously. The following quote by Lupton (2010:314) refers to a Polish immigrant in the United Kingdom who chooses to learn only English words or expressions that depict happiness and the positive, because that is the environment to which she wishes to belong:

And imagine acquiring a new language and only learning the words to describe a wonderful world, refusing to know the words for a bleak one and in doing so linguistically shaping the world that you inhabit. I don't think that's naïve, but fantastically optimistic.

It is fantastically optimistic, or, when one chooses to belong to *ikasi-style*, it can be hopelessly destructive. Either way, such a world does not have the fullness and creative potential of diversity. Woermann (2010b:185-186) argues that diversity and difference in a complex system allow us to 'engage in activities that stimulate proactive moral imagination, which, in turn, allows us to think in novel and creative ways about the future'. We cannot continue to think of the future in fantastically optimistic terms, or with doomed pessimism. We should be able to co-create an equitable future, which is what this study explores.

Chapter 2: Public education in a South African underperforming school

2.1 INTRODUCTION

Post-Apartheid South Africa inherited 15 disparate education departments with its core aims of empowering white South Africans and limiting black South Africans to lives as unskilled labourers and poverty. The differences, in terms of funding, resources, and benchmarks for teacher qualifications, between the school education available to whites, Indians, coloureds and blacks, are well-documented, as will be seen below. The effect of these discrepancies, and continuing inequities in school education, are a reminder that South Africa has not found a solution to the inherited problems, nor is enough being done at present, 19 years into democracy.

From anecdotal evidence it appears that post-apartheid South Africa is at grave risk of producing another lost generation, entrenching the racial and class divide. Education is not uplifting the poor and therefore social justice is not being achieved through education. South Africa's president, Jacob Zuma, admits that the policies of the African National Congress have not led to the delivery of quality education for the poorest of the poor (Dugger, 2009). Mamphela Ramphele¹, a South African academic, businesswoman, previous Vice Chancellor of the University of Cape Town, an anti-apartheid activist, and one of the founders of the Black Consciousness Movement (BCM) has claimed publicly that Bantu Education was better than the education provided by the democratic elected government (Everatt, 2010:74). Graeme Bloch, currently visiting adjunct professor, Wits Public and Development Management School and previously an education specialist of the Development Bank of Southern Africa, states that a township learner does not have much of a chance. 'That's the hidden curriculum – that inequality continues, that white kids do reasonably and black kids don't really stand a chance unless they can get into the formerly white schools' (Dugger, 2009).

Fleisch (in Woolman and Bishop, 2012:57-18) says that post-Apartheid South Africa has two education systems: the one well-resourced, providing quality education comparable to quality education elsewhere in the world, and providing the majority of tertiary institution

¹ (Downloaded from www.whoswhosa.co.za/mamphela-ramphele-4739, 12 September 2011).

entrants; the second system enrolls the majority of working class and poor children. It is under-resourced, and provides a limiting and limited education. Reddy, Van der Berg, Janse van Rensburg and Taylor, (2012:1-2), echo Fleisch when they assert that the South African school system consists of two historically and persistently differently functioning subsystems. They are referred to as Subsystem P, with P referring to poor schools, and Subsystem M, with M referring to middle class schools. Subsystem P schools account for 80% of South African schools, serving black learners from poor communities. Subsystem M serves middle class learners. Subsystem P schools 'were provided with the fewest resources and still bear the scars of that legacy; they are located in areas occupied by low-income households. These schools cater for a majority of students for whom the language of instruction (English) is their second or third language' (2). If Fleisch and Reddy are correct, South Africa is at risk of not meeting a fundamental human right requirement, the right to basic education, in terms of the constitution of the country, as a limiting or limited education is unlikely to fulfil the requirements set out in various laws.

In order to determine how poorly schools are performing, South African schooling will be gauged against a number of measuring instruments. This will be done by comparing the test results of the Progress in International Reading Literacy Study (PIRLS), the 2003 Third International Maths and Science Study (TIMSS), the Southern and Eastern African Consortium for Monitoring Education Quality (SACMEQ). These tests were selected because they test the outcomes of the school system, in comparison with those of other countries. Matric (National Senior Certificate, or NSC) results will also be used as a barometer of performance as the examinations are externally assessed and moderated. As a result the NSC has validity in the eyes of the labour market.

From the above it will be concluded that South African education, especially in Subsystem P, cannot be termed effective at a basic level. It is a poverty trap for learners in Subsystem P, economically and in terms of identity formation / belonging.

The third part of the chapter will look at reasons for the poor performance and resulting poverty trap. In the absence of a substantive and qualitative definition of basic education in the South African context, I will use the 'Four As' of the International Committee for Economic, Social and Cultural rights as a starting point to measure basic education. The 'Four As' (Woolman and Bishop, 2012:57-19 to 57-32) are:

1. Availability/Adequacy of teaching (quality of staff and ratios), school facilities and classrooms, and instrumentalities of learning (textbooks, computers, stationery, etc).
2. Accessibility, in terms of learners being able to make use of resources and curriculum. It includes non-discrimination, financial accessibility and physical accessibility.
3. Acceptability, i.e. directed at the full development of the human personality and at the strengthening of respect for human rights and fundamental freedoms; not violating the dignity of learners.
4. Adaptability, i.e. a flexible education that can adapt to the needs of changing societies and adapt to the needs of learners within their diverse social and cultural settings. It includes the content of the curriculum and how the curriculum content is deployed, as well as assessment practices and intervention strategies.

In conclusion, I will discuss, and motivate for, an investigation into a possible solution for the problems.

2.2 HOW DO SOUTH AFRICAN SCHOOLS FARE?

2.2.1 The Progress in International Reading Literacy Study (PIRLS)

The Progress in International Reading Literacy Study (PIRLS) was first done in South Africa between 2004 and 2007, a decade after the transition to a democratic government, (Howie, Venter, Van Staden, Zimmerman, Long, Du Toit, Scherman and Archer, 2008:1). Forty countries (45 education systems) from all regions of the world, except South America, participated. South Africa was exceptional in that it had the most rural-based populations of the group, the lowest life expectancy (46 years), the highest infant mortality rate, and the highest learner-teacher ratio. Economically, South Africa was not the poorest, and was average in terms of the percentage of GDP and public expenditure on education (ibid).

South Africa was the only country where 5th grade learners (in other words, learners a year older than those of other countries) were tested because of the ‘challenges of multiple native languages and languages of instruction’ (2). (South Africa also tested grade 4 learners). Both grades were tested in their language of instruction, in other words, tests were done in eleven

official languages. PIRLS is regarded as the first baseline data in all eleven official South African languages with international comparative data and benchmarks (3).

In 2011 South Africa participated in two of four categories: as a benchmarking country, and as a prePIRLS participant (Mullis, Martin, Foy and Drucker, 2012:5). South Africa used benchmarking to collect information relevant to language of instruction policies in South Africa. In the benchmarking category, the learners from South Africa were the oldest (Gr 5s, as opposed to Gr 4s of the other eight countries) and their language of instruction was only English or Afrikaans (39). PrePIRLS is a less difficult version of PIRLS which tested basic reading skills (29). South Africa, Columbia and Botswana participated in prePIRLS.

When South Africa first participated, PIRLS acknowledged that it would have taken time for the newly integrated national education system to reconstruct. At the time of the 2006 data collection, Pretorius and Ribbens (in Howie *et al*, 2008:1) pointed out that never before had there been ‘national assessment procedures for monitoring reading and determining whether learners are reading at their appropriate motivational levels’. On this basis, they further stated that it had been difficult, officially, to determine to what extent the learners had reading problems and whether the education system was delivering on its mandate to produce literate learners (*ibid*).

In PIRLS 2006, South Africa achieved the lowest score of all 45 education systems, in both grades. 13% of Grade 4s and 22% of Gr 5s reached the Low International Benchmark. Almost half of the learners tested in English and Afrikaans, and more than 80% of the learners tested in African languages, had not attained ‘basic reading skills and strategies’ (27). Rated against the 2006 Intermediate International Benchmark, 93% in grade 4 and 87% in grade 5 of South African learners tested across the 11 languages did not achieve ‘some reading proficiency’, in comparison with the international median percentage of 24% (28).

In 2011, South African learners again scored lowest in both the benchmarking group and the prePIRLS group (Mullis *et al*, 2012:39). Grade 5 learners in the benchmarking group scored 421 points, 18 points more on average than the 2006 cohort (50). This marginal increase is significant when one considers that the 2011 score was the lowest of all participating countries’, the group was older than other learners being tested, and only learners receiving instruction in English and Afrikaans were tested. In the benchmarking group the scores of

16% of South African learners were considered too low for estimation. 14% of prePIRLS scores were too low for estimation, again putting South Africa in the lead of under-performance (279). As a result of the high percentage of scores too low for estimation, PIRLS categorised South African scores as unreliable (50, 279).

Of further significance is the fact that a score of 400 is considered the Low International Benchmark (65). At this level students can locate and retrieve an explicitly stated detail in a literary text. In an informational text they can locate and reproduce information that is at the beginning of the text. 57% of South Africans in the benchmarking category only reached the Low International Benchmark.

At the 2006 High International Benchmark, learners are considered competent readers when they can retrieve information embedded in texts, make inferences and connections and navigate resources. They can recognise main ideas and begin to integrate ideas and information across texts. Only 3% of Gr 4s and 6% of Gr 5s in South Africa reached this level, as opposed to the international percentage of 41% (Howie *et al*, 2008:28). No learners tested in African languages reached this benchmark, and therefore none could be considered competent readers (*ibid*).

Only 1% of South African learners in Gr 4 and 2% in Gr 5 reached the 2006 Advanced International Benchmark (26). In 2011 the figure for Gr 5s increased to 4% (Mullis *et al*, 2012:69), but it must be borne in mind that this group consisted only of learners being instructed in English and Afrikaans.

Learners writing the prePIRLS were not rated in terms of Low, Intermediate, High or Advanced International Benchmarks, but, judging from the information above, it appears unlikely that South African Gr 4 learners would have outperformed the 2006 Gr 4 cohort.

Both PIRLS 2006 and 2011 underscore Fleisch's contention that South Africa has two education systems, the one enabling and the other limited and limiting. South Africa cannot claim that it is providing an enabling basic education to all its public school learners if PIRLS 2011 found no significant improvement on the PIRLS 2006 statistics, i.e. more than 80% of black learners in 2006 (the majority of whom found themselves in Fleisch's second system) did not have basic reading skills and strategies. Similarly, at the Intermediate International

Benchmark, the country failed more than 78% of its learners in 2006, unless South Africa can convincingly argue that basic education translates to a lower standard than the Low International Benchmark.

2.2.2 The Third International Maths and Science Study (TIMMS)

South African learners do not fare better in Mathematics and Science tests. In the 2003 Third International Maths and Science Study (TIMMS) covering 50 countries, South African Gr 6 learners scored lowest (Le Cordeur, 2010:530). Black South Africans fared significantly worse than their white counterparts. These inequalities are also evident when Gr 12 Maths and Science results are analysed (Bhorat and Oosthuizen in Le Cordeur, 2010:530). The impact of the poor performance in Grade 8 is a predictor of Grade 12 Mathematics performance, which makes the following statistic very alarming: only 29% of Grade 8 learners were able to answer a basic subtraction question correctly, when random guessing would have yielded a 25% correct answer (Sayed in Badat, 2012:5).

TIMMS underscores the discrepancies pointed out by PIRLS regarding the results of Fleisch's two systems, and the Subsystems of Reddy *et al.* Reddy *et al.* used TIMMS 2003 and the matric results of the 2003 Gr 8 cohort and concluded that Mathematics Standard Grade learners in Subsystem M achieved a mean score of close to double that of Subsystem P learners. They also found that 'students starting with the same mathematics capability in Grade 8, measured by TIMSS score, converted to passing matric at a different rate in Subsystem P and Subsystem M schools' (Reddy *et al.*, 2012:5).

South Africa elected not to participate in TIMMS 2007 or TIMMS 2011.

2.2.3 The Southern and Eastern African Consortium for Monitoring Education Quality

The study by the Southern and Eastern African Consortium for Monitoring Education Quality (SACMEQ) compared Gr 6 literacy and numeracy competence over the Southern African Development Community, in 2000 and in 2007. Reading ability showed no improvement between 2000 and 2007, and numeracy only a negligible improvement, South African learners performed below the SACMEQ mean in literacy and numeracy. South Africa also

performed worse than poorer countries in the region, such as Swaziland and Tanzania (Chisholm, 2011:50). Bloch (2009:64) puts it that ‘about half the kids were not even at the stage of reading to form meaning. In other words, they could not do a simple comprehension task. Only about 19% could do “analytic” or “critical” reading’. In the numeracy section, South African learners proved that they did not have a basic, enabling numeracy ability: 83% fell in the beginning numeracy category and 9% of learners could engage in mathematical problem-solving. Moloi and Chetty, (2010:57), report that 40,2% of South African Gr 6 learners are non-numerate and 27,2% are non-readers. Shabalala’s conclusion (ibid), confirms that South African Gr 6 learners’ achievements cannot be regarded as fulfilling the requirements of a basic education. He states that

learners at these lower two levels could be categorized as “non-numerate” in the sense that they have not moved beyond the mechanical skills related to basic calculation and simple shape recognition.

2.2.4 Matric results (National Senior Certificate)

Matric results, *per se*, are not a comparative score against school leaving certificates of other countries. However, as matric is a threshold and the certificate is based on a standardised, externally moderated examination, it affects entry into the labour market. As such its importance reflects the perceptions of society of the standard of school education, and therefore I include it under the reality of South African public school education. Its impact appears to be a reflection of the distrust the public have in education standards and assessment practices prior to the matric examinations, therefore the matric results have become the benchmark of reliability.

This is supported by Van den Berg, Burger, Burger *et al* (2011:9) who hold that weak assessment practices in schools and progression, despite lack of ability, have labour market implications. Employers do not appear to trust the qualifications, quality and productivity of an applicant without a matric certificate. Black workers who fail matric have an unemployment rate of almost 48%, and those who pass matric, but do not obtain entrance to university, have an unemployment rate of 42%. Black workers with a matric exemption (endorsement) pass have an unemployment rate of 36%. Moreover, the quality of the matric certificate impacts on earning ability. A black worker with matric exemption, but without

further qualifications, earns nearly twice as much as those who fail matric, and a third more than those who pass matric without exemption (ibid). Unexplained racial wage gaps, that is 'the gap between black and white wages that cannot be explained by differences in productivity and years of experience of workers' (10) can be attributed to numeracy test scores, which account for 18,6% of the difference, and quality of education, which accounts for 36,8% (10). 'The labour market is at the heart of inequality, and central to labour market inequality is the quality of education' (12).

Matric pass rates, especially passes with endorsement for university entry, correlate with the socio-economic rank of the school, according to Motala (2005:59), with schools in the top 40% performing significantly better than schools in the bottom 60% socio-economically. Case and Yogo, (1999:23), concur:

The South African Apartheid system continues to profoundly influence the life chances of many Black Africans, through its long lasting effects on the country's education system. Many Black Africans currently in the labour force attended schools with inadequately trained teachers, insufficient textbooks, and pupil-teacher ratios above 80 children per class. We find three channels through which deprivation in school resources affects the outcomes of an entire generation of Black South Africans: educational attainment, probability of employment, and returns to education.

What PIRLS, TIMMS, SACMEQ and the labour market are affirming, is that the South African public school system, especially in Subsystem P, is limiting and produces limited people who have a limited contribution to make to the economy in particular. It is questionable whether such a person would be able to escape from poverty and therefore the South African school system, by denying its learners a basic education, is trapping learners in the second system in poverty. The submission that poor quality education is a poverty trap, however, needs further exploration, and this exposition will be undertaken in the following section.

2.3 POOR QUALITY EDUCATION AS A POVERTY TRAP

South Africa's Gini coefficient² places the country as the most economically unequal country in the world. The question is whether the inequality is visible in the school system, or rather, whether the impact of the inequality can be observed through the learners. Two factors are pertinent: the National Scholar Nutrition Programme, and international test scores.

Firstly, one fact that attests to the inescapability of poverty in the schools, is that, according to the 2012/2013 Annual Report of the Department of Basic Education, the National Scholar Nutrition Programme provides daily meals by 10:00a.m. for over 9 million learners in over 21 000 schools, an increase of 3 million learners since the publication of the National Planning Commission's Development Plan in 2011 (268). To put this in perspective, one must add that there are 12 million learners in 25 000 public schools in South Africa, and that scholar nutrition is only provided to the poorest 60% of schools (ibid). Only 9% of South African learners are from wealthy homes, compared to 39% internationally (Howie *et al*, 2008:51).

Secondly, the fact that schools trapped in poverty enforce the social and economic marginalisation of the poor and vulnerable (Ramphela in Le Cordeur, 2010:524) is evidenced by the statistical analyses of PIRLS, TIMMS, and SACMEQ. Chisholm calls the association between household poverty and learning achievement one of 'the most telling findings' of SACMEQ (2011:50). Chisholm (ibid) quotes from the United Nations Educational, Scientific and Cultural Organisation (UNESCO) analysis,

children from the wealthiest households in South Africa are ten times as likely as children from the poorest households to score well on reading. This is more than double the comparable wealth differential for Namibia.

In addition, SACMEQ also found that there are an even larger percentage of non-numerate learners than illiterate learners across all regions, all school locations, and the four poorest

² 'The Gini coefficient measures the inequality among values of a [frequency distribution](#) (for example levels of [income](#))', Wikipedia, downloaded 29 October 2013

school quintiles³ (Moloi and Chetty, 2010:57). The percentage of illiterate learners is 27,2% and that of non-numerate learners, 40,2% (ibid).

The study showed that the area in which a child lives and the school she attends affect her performance more than her individual circumstances (58). The Eastern Cape and Limpopo are regarded as the poorest provinces in South Africa and respectively 38,6% and 49% of their Gr 6 learners are non-readers and 50% and 60,6% are non-numerate. In the Western Cape and Gauteng, the richest provinces, the figures for non-readers are 5,1% and 11,6% respectively and for non-numerates, 15% and 20,5% respectively (57). Learners from economically disadvantaged homes achieved more than 200 points less than learners from wealthy homes (Howie *et al*, 2008:51), which indicates that poverty could also impact on their ability to form balanced relationships outside closed communities. Poverty thus influences and impedes identity formation where identity formation is understood to be constituting meaning in relationships (more on this in chapter 3).

Van der Berg *et al* (2011:8), refers to the ‘double burden’ that learners in the second system (Subsystem P) face, on the one hand the burden of poverty, and, on the other, the burden of attending a school ‘that still bears the scars of neglect and underfunding under the apartheid dispensation’. In the next section of this chapter, I will show that these schools are not only suffering from past inequities, but also from present inequality and injustices.

In the majority of South African public schools the effects of poverty are only too visible, physically, emotionally, and as manifested in learning outcomes. The majority of schools are trapping the learners in poverty.

Quality teaching and learning is the passport out of poverty: ‘whatever else they do, education systems must equip young people with sophisticated literacy skills, the alternative is poverty and lost opportunities for the individual and for society’ (Haggerty in Howie *et al*, 2008:59). The emphasis is on ‘sophisticated’ literacy skills, yet the majority of South African learners do not attain basic literacy skills, as reported by PIRLS, TIMMS, and SACMEQ.

Unless the why, who and what of basic education, and then quality teaching and learning, are interrogated, and unless it is accepted that education is a societal matter, society and

³ Public schools are ranked in five quintiles, with quintile 5 schools situated in the most affluent areas, and quintile 1 schools being the poorest.

government are at risk of perpetuating existing inequalities. Further on in this study, I intend to undertake such a critical analysis at the hand of complexity thinking and identity formation, but first one has to look at the reasons for the underperformance of the majority of South African public schools.

2.4 SUGGESTED REASONS FOR THE UNDERPERFORMANCE

As stated in the introduction to this chapter, the absence of a substantive and qualitative definition of basic education in the South African context necessitates that one turns elsewhere for a measure of an enabling basic education. I will use the 'Four As' of the International Committee for Economic, Social and Cultural Rights as a starting point to measure basic education. The 'Four As' (Woolman and Bishop, 2012:57-19 to 57-32) are *Availability/Adequacy, Accessibility, Acceptability and Adaptability*. In each instance I will explain briefly what Woolman and Bishop include under the 'Four As', followed by a more detailed discussion pertaining to each of them.

2.4.1 Availability/Adequacy

Availability/Adequacy refers to the availability/adequacy of teaching, in other words, the quality of staff and staff-learner ratios, school facilities and classrooms, and instrumentalities of learning (textbooks, computers, stationery, etc). Except for teacher quality, every one of the components are dependent on funding, specifically funding down to the learner. Per capita funding is regarded as a key equity indicator (Motala, 2005:41) and will assist in concluding whether the South African public school system provides adequate and available education.

I will therefore first refer to funding allocations in pre-democratic South Africa, before turning to post-Apartheid South Africa, as a contributing factor to current inequities. Availability and adequacy of staff as further contributing factors will be discussed thereafter.

2.4.1.1 *School Funding*

If a poverty trap is ‘any reinforcing mechanism that causes poverty to persist’ (Azariadis and Stachurski in Santos, 2009:1), then there is no doubt that the South African education system was a poverty trap for the majority of South African learners during the Apartheid years. In 1994, the apartheid education system consisted of fifteen different departments serving various population groups and the so-called homelands. The per capita expenditure per learner in white schools was R5 403 per annum, of which more than 90% was spent on personnel costs. The white learner could expect a class room size of 18 learners. In the Transkei R1 053 per annum was spent on a black learner in 1994, and the learner-teacher ratio was 70-1 (Patel, 2004:2).

A dearth of information is available on pre-1994 resource availability in schools, but the 1996 data published in the Government Gazette (Nr 33282, 11 June 2010:17) could be a fair reflection of the pre-1994 state of affairs of available facilities, albeit not necessarily functioning or stocked facilities. During the Apartheid era, 59,2% of schools had no electricity, 12,2% of schools had no toilets on site, 60,6% had no telephone, 68,6% had no computers for teaching and learning, 82,1% had no libraries, 75,6% of schools had no laboratories, and in 56,6% of schools learners could expect to share the class with at least 45 other learners.

The Constitution of South Africa declares that the cost of provision of schooling for all children to the age of 15, or the end of Gr 9, at an acceptable level of quality, must be borne from public funds. Post-Apartheid South Africa did not have the financial means to provide free education at any level, and definitely not at the level enjoyed by whites under Apartheid. In this section I will show that this, together with the failure of government to determine an acceptable level of quality, as well as the cost thereof, and to draft and implement policies accordingly, are some of the key underpinning mechanisms for the unacceptable and iniquitous state of education in rural or suburban public schools in South Africa. The perpetuation of inequity in South African education is nowhere more evident and quantifiable than in funding and infrastructure, despite the overarching aim of redress and equity through a redistribution of resources at school level. Nineteen years into democracy unequal education continues to trap learners in poverty because learners from different backgrounds

do not have equal opportunities to benefit from quality education, a pre-requisite for the ‘equalizing promise of education’, according to the World Bank (Santos, 2009:1).

Government is aware of the link between equitable funding, redress and improving the quality of school education, and it undertakes to provide resources for progressively effecting redress and equity in the General Education phase (grades 1 to 9) and the Further Education and Training (grades 10 to 12, or equivalent) phase. The intention is to target public funding specifically to the needs of the poorest, as stated in the *Norms and Standards for School Funding Act, 2006 (2B-34-35)*.

First, an explanation of the flow of national money to a child in a public school, and the levying of school fees, are required. Providing basic education is the responsibility of the national and provincial governments. Money flows from national to provincial level according to the Equitable Share Formula (ESF) per child, geared at inter-provincial equity, and to ensure that every child receives an equitable amount. Provincial legislatures decide how to spread their equitable share across all social services and therefore actual per capita education expenditure differs from province to province (Organisation for Economic Co-operation and Development (OECD) Report, 2008:101). After deciding on the share to give to education, provinces allocate funding to schools in terms of the *National Norms and Standards for School Funding Act*, amended in 2006. Provincial expenditure is aimed at more equitable intra-provincial expenditure, hence the differences between provinces.

School fees, to be levied by School Governing Bodies, became a statutory obligation of parents as the *South African Schools Act (1996)* called for a partnership funding approach to ‘achieve four key principles: attaining equity, advancing quality, redressing imbalances, and improving efficiency’ (Motala, 2005:42). The partnership would be between the state and parents who would be able to supplement the minimal level of funding from the state if the school needed higher resourcing. Schools could also apply for Section 21 status which gave them the right to maintain and improve the property, buildings and grounds of the state, purchase learner teacher support material, and more. Initially Section 21 status was given mainly to former white schools whose governing bodies had the skills to assume such financial and other responsibilities (Pampallis, 2005:14), and whose school fee income was sufficiently substantial to carry the burden of available/adequate teaching and learning as government could not provide adequate funding to so-called rich schools. The rationale

behind a partnership funding approach was to redress past imbalances and to make state resources available to township and rural public schools. Section 21 status has now been given to the majority of public schools in the country, despite lack of funding and expertise of School Governing Bodies and staff.

State funding would be on a sliding scale, favouring the poor. The poor, however, whose children were already trapped in under-resourced, underperforming schools, did not have the financial means and ability to supplement government funding to schools. Government funding was allocated from available funds and not driven by the basic cost of education, the poverty index of communities, the special education requirements of learners, etc, as recommended by the Financial and Fiscal Commission (FCC), (Motala, 2005:61). The FCC recommendations are based on poverty considerations and regard the provision of education as a constitutional right.

By providing for education from available funds, government contributed to the two systems of Fleisch and Reddy *et al*, and fulfilled the predictions of the South African Democratic Teachers' Union which warned that fees, as laid out by the *South African Schools Act*, reflected a 'two nation growth strategy that would perpetuate the inequalities of the past'. They concluded that education would be at the mercy of market forces (Pampallis, 2005:29). The impact of this approach on financial access to schooling will be discussed under *Accessibility* in the next section.

The Department of Education, aware that 'learners of poorer and less educated parents 'need a more intensive, and hence more costly, education than do more advantaged learners'' (Department of Education, in OECD, 2008:102), introduced national quintiles (a scale of 1 to 5, with quintile 1 being the poorest of the poor schools, and quintile 5 being financially well-off schools). According to the School Funding Norms, a 35-25-20-15-5 distribution of funds should be applied to quintiles 1 to 5, with quintile 1 schools receiving 35% of the available funds. Distributional equity in South Africa, according to Motala (2005:54), is focused on equal spending per learner across provinces and equal learner-teacher ratios. However, in the South African context with its historical backlogs, inequity is exacerbated by inadequate financial inputs and the education system not meeting even basic outcomes, when compared with other countries. Moreover, the gap is widened by the availability or not of private funds to schools.

This system has problems: firstly, funds arriving at school level do not guarantee proper spending, as schools have unequal capacity to spend money. Secondly, quintile allocations are contested frequently as the quintile allocation of a school is determined by the area in which a school is situated, the infrastructure of a school and by the fact that a province can only afford a certain number of schools, in lower quintiles. An example of a school that contested its quintile allocation of 4 for three years is a school situated in a township in the Eastern Cape. It is surrounded by informal settlements and housing for the poor, with buildings that had seen no structural maintenance in 20 years, three working toilets for 250 female learners, no sports fields, no computers for learners and no functioning library. Only in 2011 was its status changed to quintile 3, which meant its funding increased marginally and it could participate in the National Scholar Nutrition Programme. Thirdly, government recognises that an unequal distribution in the bottom three quintiles is unjust as it should not distinguish between grades of poverty in a province where 60% of the population of the Eastern Cape is regarded as poor. Unequal distribution of funds to the poor exacerbates inequality (National Treasury, 2003, in OCED, 2008:103), yet unequal distribution remains a reality to this day.

Education expenditure increased from R31,1 billion in 1995 to R105,5 billion in 2007 (OECD, 2008:96), but in real terms expenditure has declined as a share of total government expenditure and Gross Domestic Product, as education competes with other provincial departments in need of redress, for example health, housing and welfare (2008:25). Education's share of government funding decreased from 22% in 1996/1997 to 17,7% in 2009/10 (Chisholm, 2011:52), which is less than that of neighbouring countries. In the post-Apartheid period education has grown more slowly in terms of real growth rate than any other social service, and its allocations from provincial funding has been trimmed (Weldeman, 2005:14 in OECD, 2008:97). Exacerbating factors are the inability of provincial governments to spend their allocations, as well as corruption and mismanagement at all levels.

According to the Organisation of Economic Co-operation and Development (OECD) Report, policy implementation to redress inequity is not only hampered by decreasing available funds, but also by 'the scale of the existing backlogs; inefficiencies in education management and delivery and a lack of capacity at provincial and district levels; difficulties in containing expenditure on educational personnel and in redirecting funds towards non-

personnel expenses, and the desire to equalise per capita learner expenditure despite large disparities between provinces and schools.’ (OECD, 2008:24-25). One can only conclude that policies based on distributional equity have not achieved its goals of redress.

The adequacy of funding is questioned in the OCED Report, but the report does not advocate an adequacy approach or any other approach to equity funding. An adequacy approach would see an ‘equitable education financing system assure that each school had sufficient resources to provide an adequate level of education to the students it serves’ (Motala, 2005:55). Such an approach would focus attention on the purpose of education and would take cognisance of social resources outside the control of the school.

The report does not break down the average per capita allocation into its cost centres and therefore does not quantify the inadequacies⁴. In fairness to the OECD Report it must be pointed out that the OECD had to review educational policies, and not implementation at grass roots level.

Per capita funding per learner has increased substantially but is not sufficient to redress imbalances and inequalities from pre-1994. Statistics from the Eastern Cape, one of the worst performing provinces, will be used to explain: The Eastern Cape Department of Education is the largest Education Department in South Africa, with more than half its learners and personnel in the previous homelands, Ciskei and Transkei. White, coloured, Indian and black per capita allocation in 1994 was an average of R3 990. The average per capita expenditure in Ciskei and Transkei was R1554 (Patel, 2004:2). The backlog of the Eastern Cape should not be underestimated and the fact that, by 2007, this province still spent less on education than the national average per capita is alarming. Add to this the fact that most of this allocation is spent on better salaries and one understands why the OECD Report concludes that inadequate spending ‘leaves the infrastructure deficits of poor schools largely unchanged’. In short, ‘there is no hard evidence to prove that present levels of expenditure have overhauled existing inequalities or contributed to a notion of effective redress’ (Wildeman, 2005, in OECD, 2008:106).

⁴ Cost centres refer to the six centres into which the allocations should be divided. These are Learner Teacher Support Material, School Stationery, Non-education Consumables, Education Consumables, Maintenance and Municipal Services.

During 2007, no-fee schools received a minimum of R554 per learner for non-personnel expenditure (this, despite the fact that in 2003 the Department of Education provisionally set the minimum cost package at between R600 and R1000 per learner (Department of Education, 2003, in OECD, 2008:103)). This amount was to be allocated as follows: 12% of the total allocation to school stationery; 45% to learning and teaching support materials, 10% to education consumables, 5% to non-education consumables, 10% to municipal services and 8 or 18% to maintenance (pending quintile)⁵. If the school is in quintile 1-3, 10% of the total is paid as a cash amount. By 2012 this amount increased to R880.00 per annum for a learner in a quintile 1 school, R810.00 per learner in quintiles 1 and 2; R437.00 per learner in quintile 4 and R150.00 per learner in quintile 5.

In the 2013 financial year, seven provinces no longer distinguished between the poverty levels of quintile 1, 2 and 3 schools, in other words, the three quintiles received the same allocation. The Eastern Cape, Mpumalanga and North West Province allocated R926.00 per quintile 1 to 3 learner, in comparison with the R1 010.00 per learner in the Western Cape, Free State and Gauteng⁶.

A practical example of the impact is that a quintile 3 no fee paying secondary school would have to introduce a new curriculum in 2013, for grade 11, with new textbooks in each of the learner's seven subjects, as decreed by the national government, with only R364.50 per learner for all Learner Teacher Support Materials, i.e. textbooks, amongst others. In 2014, the new curriculum is introduced for grades 8, 9 and 12. The allocation per learner for all curricular materials is R415.80 per learner. With regard to textbooks, Van der Berg *et al* (2011:5) say that providing access to textbooks delivers significant returns in outcomes, yet the anticipated allowance per learner for school books and stationery was R100 per learner, and if the state could not provide that much to learners, the R100 would go to the poorest learners (Patel, 2004:6). This amount, or even double this amount, would be inadequate and would not make textbooks available to all learners.

⁵ This information is contained in various circulars pertaining to Norms and Standards Funding, by the Department of Basic Education.

⁶ <http://www.education.gov.za/Newsroom/ParliamentaryQuestions/2013ParliamentaryQuestions/tabid/859/ctl/Details/mid/2405/ItemID/3730/Default.aspx>. Downloaded 30 October 2013.

No-fee paying schools and schools with low-income families do not have the expertise amongst parents, or available staff, to raise additional funds that will give learners an equitable chance at competing with their peers in financially well-off schools. Nor do such schools have or receive the funds for computers, security and libraries, which would again add to the learners' chances. By 2006, 68% of South African schools had no computers; 63% of secondary schools had no laboratory space and only 10% of schools had adequately stocked laboratory spaces. 7,22% of schools had adequately stocked library spaces (OECD, 2008:108). These statistics, when compared with those of 1996, reveal the alarming backlog and the fact that little redress had been effected: a 0,8% increase in computers for teaching and learning, a 12,5% increase in laboratory space, and the lack of functioning libraries, confirm that public school education has been unavailable and inadequate in term of school facilities and the instrumentalities of learning. Although classroom sizes have decreased, 25% of schools still have more than 45 learners per class (National Planning Commission, 2011:268), and 35% have 30-45 learners per class. Further statistics indicate that 12,6 of schools do not have water on or near the site, 6% have no toilets, 15% have more than 50 learners per toilet and 17% of schools have no source of electricity on or near the site, (OECD:107-108).

Mullis *et al*, (2012:159), report in the 2011 PIRLS report on the correlation between poor performance and no school libraries, or inadequate/no computer facilities for instruction. South Africa in both the benchmarking category and the prePIRLS obtained the lowest literacy scores, and had the highest percentage of schools with no computers with instruction (*ibid*), and the highest percentage of schools with no libraries (157). In both categories South African schools were also regarded as the most unsafe and disorderly (177).

Funding also impacts on the availability and adequacy of human resources. Immediately post-1994 personnel expenditure accounted for 90% of the education budget in many provinces. This has been reduced to a national average of 83,9% with Mpumalanga, Gauteng and the Eastern Cape below the national average. Of this percentage, teaching personnel costs should not be higher than 85%, but in 2006 it was reported that '60% of schools have no administrative assistant, 70% of schools have no support employee, and 42% of schools have neither of the two' (OECD, 2008:104). This situation has not improved as the department has yet to publish a post establishment for non-teaching staff in schools. One therefore has to question whether the 15% non-teaching personnel are located in district and

provincial offices while schools are left with crippling shortages. Once again, government admits that inequalities in provisioning of support staff in historically disadvantaged schools 'is most certainly associated with major inefficiencies in schools which serve poor communities', (*Norms and Standards for School Funding Act, 2006, 2B-34*).

The models being used to allocate teaching staff to schools remain contentious despite the assertion that poor schools are targeted for personnel redress. 5% of the number of posts a province can afford, are top-sliced for redress in previously disadvantaged schools, however, the post provisioning norms become problematic when the weight factor of subjects is considered. Poor secondary schools cannot afford to offer practical subjects such as Computer Applications Technology or Consumer Studies because they do not have the infrastructure, or the finances to maintain the facilities, or the finances to hire qualified staff. Yet these are the subjects that are weighted heavily on the post provisioning model. Another above-average weighted subject is Physical Science, a subject that can often not be taken by learners from disadvantaged backgrounds, because of disabling teaching and learning in lower grades, or because of teacher unavailability. It is therefore disingenuous for government to assert that post provisioning models favour poor schools as that is not the experience at grass roots level. A shortage of human resources impacts on the management of schools, on the load on teachers, on the ability of schools to raise additional funds, and on school safety and orderliness, as fewer people have to do the work of many. Most importantly, though, is that a shortage of human resources impact on teaching and learning itself.

According to the *Norms and Standards for School Funding Act, 2006*, the aim of government is to provide personnel on the basis of an equitable cost per learner, to effect redress and equity. Until such time that the equitable cost per learner is quantified and qualified, equity will remain a political aim. Motala (2005:45) refer to the unresolved debate in South African school education:

[the] debate in the South African context revolves around what constitutes minimum learning standards (Meyer & Motala, 1996, 1997). Drawing on constitutional provision, which is unambiguous about the right to education, a starting point for the costing of minimum standards in the South African context has to be what constitutes basic education.

They advocate establishing these norms and standards in order to calculate the cost of providing the infrastructure for a basic education. This is necessary so that adequate funding could be made available. It is the absence of such a quantitative or qualitative framework, to which I have been referring, that provides the state the opportunity to renege on its responsibility to all learners. The Financial and Fiscal Commission recommendations are based on poverty and regard education as a constitutional right, as stated previously. Patel (in Motala, 2005:61) says revisions based on the FCC will ‘profoundly contribute towards equity’.

In September 2013, the Minister of Basic Education published draft minimum uniform norms and standards for public schools⁷, after Equal Education obtained a court order to compel her to do so. If the draft is accepted, government has until the end of 2030 to implement the norms and standards. Equal Education has voiced their concerns regarding the timeframes and accountability⁸.

Before moving on to teacher adequacy and availability as another possible reason for the unacceptable reality in the majority of South African public schools, it is safe to conclude that neither during Apartheid, nor post-Apartheid, have adequate school facilities and classrooms been made available. Neither have the instrumentalities of learning to every learner, nor funding for adequate staff resources been made available. The inequities of the past are being perpetuated by a system that cannot be regarded as fair to learners.

2.4.1.2 *Availability/Adequacy of staff*

Morrow (2007:188) says one of the key elements of the epistemological deprivation of learners is the fact that teachers are not adequately prepared for their professional responsibilities. He blames Apartheid for generating and perpetuating epistemological lack of access as it denied the majority of learners ‘a fair opportunity to gain access to the kind of knowledge that is supposed to be distributed in formal schooling’. Epistemological access will be dealt with later, but first it must be established whether Morrow is correct when he asserts that teachers are not adequately prepared for their professional responsibilities.

⁷ Government Gazette, volume 579, nr 26837.

⁸ <http://www.equaleducation.org.za/article/2013-10-15-equal-education-submits-comment-on-draft-norms-and-standards-parents-learners-voice-their-dissatisfaction>. Downloaded 30 October 2013.

a) Subject specific teacher training

In 2001, 27% of black Maths learners and 38% of black Science learners at public secondary schools were taught by teachers with no qualifications in Maths or Science (Le Cordeur, 2010:530). This situation has not improved across the different phases of school education, i.e. the GET and FET phases. A 2009 study by the Human Sciences Research Council into the match between Mathematics teachers and their qualifications across all school phases shows that only 34% of 824 Intermediate Phase mathematics teachers have a mathematics qualification. Moreover, the HSRC found that there is an inadequate match between teachers' qualifications and what they teach (Arends, 2011:3).

60% of the tested South African learners in Gr 4 and 5 were taught by teachers with a 3 year college diploma or a post-matric qualification, and showed a decreased overall mean performance in comparison to those whose teachers reported to have a postgraduate qualification. In 2005, only 38% of South African teachers in public schools had a matric plus three year qualification, and 23% had matric plus a four year tertiary qualification (Le Cordeur, 2010:530). Teacher training during the apartheid years was characterised by different programmes for different racial groups, with 'programmes for blacks underpinned by compliance, rote, and transmission-orientated practices' (Osman, 2010:23). It is no wonder that attempts to introduce learner-centred approaches in rural and suburban schools are failing. The most prominent reading activity in South African schools studied by PIRLS is that of the teacher reading aloud, suggesting a teacher-centred approach 'which may promote learner passivity in their own reading development' (Howie *et al*, 2008:54).

Teacher training, according to PIRLS, could have a significant impact on learner performance, but Van der Berg *et al* (2011:5) warn against regarding teacher knowledge as the 'magic bullet'. Their analysis of SACMEQ 111 shows that insufficient teacher knowledge is a problem but that it made little difference to learner performance: 'After accounting for other factors affecting learner scores, a 100 point improvement in average teacher Reading scores was only accompanied by an average 7 point increase in learner scores'. 'In Mathematics, a 100 point increase in teacher scores was associated with an even smaller average change of 4,8 points'. They correctly state that this finding does not imply teacher quality is unimportant, but that one should look at factors other than subject knowledge that contribute to teacher quality. The socio-economic status of the school also appears to have an

effect on teacher quality as Van der Berg *et al* found a much smaller impact of teacher knowledge on reading scores in the poorer 80% of public schools, ‘and for the Mathematics scores of these schools we see no significant effect’ (ibid).

This is echoed by Chisholm (2011:55) when she says that the improvement in teacher qualifications and in-service teacher development do not appear to have a significant impact on learner outcomes. She, however, points to the quality of teacher education and development programmes as the reasons for the inadequate impact. I believe the reasons are more complex, as will be argued in this and further chapters.

I will now explore the physical and emotional absenteeism of teachers as reasons for the unavailability of teachers in schools, and as a consequence, affecting the quality of teaching.

b) Teacher absenteeism, physically and mentally

Reddy *et al* (2010) investigated the impact of teacher leave on the public school systems. They found that in low income countries, no substitution for teachers on leave existed, nor was it likely that the home of the learner would be able to compensate for lost teaching time. In South Africa, teachers must account for 1800 hours of teaching-related activities per year: 1400 for classroom teaching, and 400 hours for activities outside the classroom, including preparation and professional development (not exceeding 80 hours), (Reddy *et al*, 2010:ix). The report says that their ‘conservative, optimistic estimate is that on average, 20-24 days of regular instructional time [is] being lost by each educator’, a teacher absence of between 10 to 12% (ibid). Moreover, leave rates are higher in schools where the socio-economic environment such as poverty, is highest (63). In Lower Income Countries, teacher absenteeism appears driven by features of the school, community and institutional environment, rather than individual characteristics (24). South Africa is not a Low Income Country, but falls into this category because of the high income inequality. Pitkoff (in Reddy *et al*, 2010:24) says that the highest predictor of teacher absenteeism is learners reading below their age-related norm, and the second highest predictor is where learners qualify for lunches through a feeding scheme. In other words, poverty and poor environmental conditions are predictors of teacher absenteeism.

Yet, learners in poor rural and suburban schools can least afford the loss of instructional time in terms of learner preparedness for the demands of society (or at the very least, in terms of demands of the curriculum), nor can the schools afford substitution. High levels of teacher absenteeism correlate with learner absenteeism, increased work-load and stress of other teachers, amongst other factors. A principal plays a major role in reducing teacher absenteeism, firstly by limiting his/her own absence from school, and secondly by being a supportive leader with little tolerance for those who increase the work load of other teachers (Dworkin *et al* in Reddy *et al*, 2010:23).

Teacher presence in the classroom, however, does not imply quality of teaching and learning. Quality and not quantity, is highlighted by PIRLS when it found that the amount of time spent on reading instruction does not correlate with performance (2008:41). Zull (in Reis, 2004:1), contends that

displaying a personal interest in students is not only effective as a way to encourage participation and engagement, but necessary for real learning. For example, research in neuroscience and the physiology of learning demonstrates the strong link between emotion and cognition.

Reis explains further that little learning occurs in the absence of the strong, positive emotions engendered by caring, deep engagement, motivation, and interest (*ibid*). Personal engagement with learners also improves learner attendance and motivation to learn (Lewis and Sylvia in Reis, 2004:2). A teacher who displays personal interest gives and means hope to a learner, to the teacher him- or herself and to society. South African education in poor rural and suburban schools appears to live up to Morin's (1999:38) warning, 'The worst dangers and the greatest hopes are borne by the same function: the human mind itself'. Price and Clark (in *The Sunday Times*, 31 July 2011) concur that '[p]erhaps the most important of all, it needs a mindset of success'. The significance of hope for education will be discussed in more detail in the chapter on identity formation. Suffice it to say that a teacher who is demotivated, has inadequate training and lacks subject knowledge, and has a real or perceived lack of resources, etc, will most likely not engage personally with learners.

Despite the negative impact of teacher absenteeism on quality teaching and learning, departmental and union meetings and workshops continue to take place during school hours.

No voice of authority condemns incidents such as several hundred teachers abandoning classes to support a colleague appearing in court (Business Day, 14 July 2010). This, despite President's Zuma's call for teachers and learners to be in school, on time, teaching and learning and not neglecting their duties (State of the Nation Address, 3 June 2009).

Neither is a voice of authority speaking up against the effects of unionisation on education. Workers' rights have been advanced at the expense of professional ethics and dedication. The majority of South African teachers belong to the South African Democratic Teachers' Union (SADTU), an affiliate of Cosatu. While they have legitimate demands for better working conditions, their protest activities, and meetings during school hours, have a negative impact on teaching and learning, especially because of the effects of collectivism and unquestioning loyalty to the demands of the unions, in particular SADTU. Unionism has resulted in a large percentage of the teaching corps alienated from the core purpose of teaching; a teaching corps waiting on outsiders to provide while they as teachers are disengaged from the demands of their profession, if the comments of education experts, like Jansen, are accepted (see chapter 1).

The people who should make education available and acceptable to learners, i.e. those in power, such as the politicians and the people at the interface with the learner, the teachers, are unavailable and inadequate, and do not provide adequate resources. If they are failing the learner in the first instance, then it would be difficult for them to make education accessible to the learner, in other words, to unlock the curriculum and the world to the child. This brings us to the second 'A'.

2.4.2 Accessibility

Accessibility is the second of the 'Four As' of Woolman and Bishop (2012). It refers to the fact that for a basic education, learners should be able to make use of resources and curriculum. It includes non-discrimination, for example a non-discriminatory admissions policy at a school, financial accessibility and physical accessibility. I want to include epistemological access under *Accessibility*.

In this section I will sketch formal physical access in terms of what is called ‘massification’ and the problems experienced in South Africa, compared with massification in other countries. This will be followed by a discussion on epistemological access and financial access.

2.4.2.1 *Physical Access*

The history of South African education shows two secondary school massification processes, where *massification* is understood to be mass entry into the school system. Crouch and Vinjevold (2006:10-11) say the first process occurred, mainly for white learners, in the middle third of the 20th Century (roughly at the same time as massification processes in most Western countries). They do not speculate on the reasons thereof, but one could assume it started after the world financial crisis of the 1930s. In South Africa a massification process for mainly whites could be linked to the rise of Afrikaner nationalism. The second massification process, mainly for black learners, started around the late 1970s until the mid-1990s. It could be linked to the political conditions of blacks.

No country in the world expanded its secondary school access as fast as South Africa did for black South Africans in the period from the 1970s to 1995 (10) when black South Africans’ access to secondary education increased by over 200%. Unfortunately this increased access did not imply quality. It would appear that South Africa could not increase formal and epistemological access at the same time, or as Crouch and Vinjevold put it (5), ‘South Africa, our case in point, is an outlier in the direction of an imbalance in favo[u]r of access and against quality’.

The Crouch and Vinjevold study found that quality rates of South African learners were significantly lower than those of a number of sub-Saharan African states that were economically poorer than South Africa (7), except for Namibia, Lesotho, Malawi and Zambia, ‘Countries in Southern Africa in general, whether they were part of the apartheid system or not, seem to have an unbalanced approach, where access does not go along very well with learning achievement’ (ibid).

Crouch and Vinjevold (11) used matric results as the ‘all-important barometer of quality’ ‘for good or ill’ to determine the link between access and quality. They state that the first and second massification processes in South Africa resulted in shifts of what is expected of learners, in other words, standards appeared to be lowered. To support their findings, they refer, amongst other examples, to practices introduced in the ‘white’ massification process, such as the introduction of school-based annual assessment being added to the final examination marks (ibid), a practice that is often regarded as one of the reasons for what is assumed to be a lowering of standards today. They argue that this lowering of expectations is why South African matric results may show improvement, but when learning results and access are plotted, South African learners are outliers (12).

Crouch and Vinjevold (5) point out that in countries that outperformed South Africa, concerns about learning resulted in debates and policy shifts towards quality during periods of increased access, in other words, care was taken to ensure that mass entry into the school system did not compromise quality. For this finding, Crouch and Vinjevold (3-4) relied on two international studies that involve secondary and primary school learners: PISA (reading, mathematics and scientific literacy scales, tested at 15 years of age), and TIMMS 2003. It was concluded that South Africa showed the greatest imbalance between access and quality in a cross-sectional correlation between access and learning, as gauged in 72 countries (of which 27 are termed developing countries). The imbalance was also evident in a correlation between growth of enrolment and learning results, based on TIMMS 2003 (5-6). When the statistical impact of access, if considered as too fast, was measured, it was clear to the researchers that South Africa could not use that excuse to explain its failure to deliver quality education (7). They stated, ‘Again South Africa is shown to be an outlier: her low performance is not explainable in terms of an unduly fast expansion of secondary schooling’, (6).

It can be concluded that physical access to education has not resulted in quality learning and teaching in South Africa, but attempts are being made to address possible causes, as Crouch and Vinjevold (15) put it:

As South Africa increasingly recognizes that it has put access before cognitive development in the past, and that this tendency is pervasive in the system, it is turning

to trying to redress this imbalance, particularly in favour of the African majority. Tensions are likely to continue, but the task has been engaged.

We now turn to epistemological and financial access to quality learning and teaching as possible reasons for the failings of teaching and learning.

2.4.2.2 *Epistemological Access*

Morrow (2007:2) says that formal access to education is important, especially in the light of the injustices of the past, but far more important is epistemological access, which, as quoted earlier, was denied the majority of South African learners by Apartheid and as a result of Apartheid. He regards teaching as the practice of enabling epistemological access; it must be systematic and organised to enable epistemological access (85). Education must be 'learning-centred' as opposed to learner-centred (207), but I want to add that education must be learning-centred *and* teaching-centred as all participants should be actively involved in learning and teaching, in producing and disseminating knowledge. The question is whether learners in the majority of South African public schools are able to access what is being taught so that they can learn and teach it, in other words, whether they have epistemological access to the content.

When one considers the performance in numeracy and literacy of South African learners as per the PIRLS, SACMEQ and TIMMS studies (see earlier in this chapter), it is clear that the learners do not have the skills to unlock basic content, let alone do they have the requisite sophisticated literacy skills to unlock content critically. The need for numeracy skills pervades many learning areas as learners are expected to make calculations, plot graphs, extract information from tables, use formulae, and more, but without basic numeracy skills this cannot be done. Thus limited and limiting numeracy and literacy are rightly considered to be a barrier to epistemological access, as Morrow (204) says,

If the quality of schooling is understood in terms of enabling access to the modern world, and if such access depends on literacy and numeracy, then improving the quality of schooling for the majority, and particularly the disadvantaged, still evades us.

The Emerging Voices report of the Nelson Mandela Foundation (2005:88), found that 42% of learners in the Eastern Cape, KwaZulu-Natal and Limpopo schools do not understand when their teachers speak, nor do they understand the language of their textbooks. Epistemological access is therefore denied to a large percentage of learners, resulting in learners' experience of schooling being littered with 'foreign words' and concepts that are not accessible to them through the cultural resources of their life worlds (Lotz-Sitsika, 2010:11). Lotz-Sitsika argues convincingly that teaching practices limit and constrain epistemological access. She gives four reasons: firstly, when teaching practices are not sufficiently sophisticated to mediate between the abstract and the concrete; secondly, if inadequate attention is given to normative (curricular) 'expectations associated with knowledge structures, progression and standards'. Thirdly, when the teachers fear teaching content, which is not fully known to them, they limit the scope and depth of exposure to new knowledge and the unknown. Lastly, inadequate feedback that does not allow learners to reflect on the quality of their work, or poor assessment practices, also has an adverse effect on the quality of epistemological access as it brings learners under false impressions of their abilities, and precludes learning from mistakes (Lotz-Sitsika, 2009:69-70). The findings of Lam, Ardington and Leibbrandt (2011), as mentioned in 2.4.4, are also pertinent.

Language is a determining factor in epistemological access. Neville Alexander, (2010:12-13), states that for 'something like 70% to 80% of the population of South Africa, it is currently simply not possible to acquire the kind of proficiency in English that would empower them sufficiently to be able to compete on an equitable basis in the market for highly skilled and remunerated jobs. He states that language is one of 'the most important means of empowerment of both individuals and societies' and that mother tongue based bilingual education is one of the few keys that can open the doors of learning. This brings us the Heugh's findings (2005:15), which go a long way towards explaining the barriers language places to epistemological access:

- Subtractive and early-exit transitional models can only offer students a score of between 20% and 40% in the ILWC [International Languages of Wider Communication] by the end of school and this means failure across the curriculum.

- MTE [Mother Tongue Education] needs to be reinforced and developed for at least 6 years of formal school in order for successful official/foreign language and academic success to take place.
- Under optimal conditions, it takes 6-8 years to learn a second language sufficiently well to use it as a medium of instruction. (In Africa, where the conditions are not optimal, it would probably take more years.)
- Language education models, which remove MT as a primary medium of instruction before grade 5, will facilitate little success for the majority of learners.
- Language education models, which retain MT as a primary medium of instruction for six years, can succeed under well-resourced conditions in African settings.
- Eight years of MTE can be enough under less well-resourced conditions.

The language policy for South African public schools sees learners receiving mother tongue instruction from grades 1 to 5, if the language of learning and teaching (LOLT) of the school is the mother tongue of the learner (Parents can elect to send their children to schools where their mother tongue is not the LOLT). An additional language is introduced from grade 1. In grade 6 learners are expected to switch to either Afrikaans or English as the language of learning and teaching.

Wright (2012:111) says South Africa has one of the best and most feasible Language-in-Education Polic[ies] (LIEP) in the world, but it is ‘inextricably entwined with the country’s National Language Policy (NLP) which is widely acknowledged not to be working’. According to Wright, we have to understand the broader linguistic environment which is ‘throttling’ (ibid) the NLP, to understand why epistemological access through language is compromised, and why multilingualism in South Africa appears to be a dream. He states that the NLP is not working because (ibid)

across the board it runs counter to the social energies, the numerical pressures and the economic drivers which continue to propel South Africa’s language dispensation in a different direction.

The current practices, which see English being used in the central economy, in government, and for national and international communication, follow a ‘colonial or neo-colonial model’

(ibid) which requires less financial resources, less social effort and less intellectual innovation than the NLP. In other words, social expectation and economic forces mitigate against the concept of multilingualism in which all languages are considered equal. The power of discursive practices on epistemological access will be discussed in more detail in chapters 3 and 4. What is also important to note at this stage, is that he cautions that it is not the LOLT, but the quality of teaching and learning that is a decisive factor (115).

Physical access to public school education has increased, as has been noted, but learners in a classroom should not merely imply passivity and numbers on registers. It should imply learners that are enabled and have epistemological access to the content. It should imply active participation by teachers and learners in the process of teaching and learning, and it should imply an acceptance of the concept of life-long learning and applying learned skills so that every child has a fair chance.

Until that happens, repetition rates, already much higher than the international norm, according to Chisholm (2011:51), will prevail, and over-age learners will be more likely to drop out. More alarming are the 'silent exclusions': learners who are enrolled, but because they learn very little, they are more likely to drop out (ibid). The silence of government to define basic education and then ensure meaningful access, is at the root of the iniquitous situation that allows learners to be no more than 'silent exclusions'.

Drop out statistics at school level bear testimony to the above. Badat, Vice Chancellor of Rhodes University, (2012:5) says, '2 out of 10 students drop-out after Grade 3; 4 out of 10 after Grade 9, 6 out of 10 after Grade 10 and 7,3 after grade 11'. The National Planning Commission (2011:276) warns that the system is 'wasting significant human potential and harming the life-chances of those concerned'. Retention remains low as evidenced by the fact that 23% of Gr 1s who started school in 1997 passed matric in 2008 (Bhorat and Oosthuizen in Le Cordeur, 2010:531). Only 38% of learners who started school in 1998, wrote matric in 2009. Of the original group, only 25% passed. (Or, 1 444 018 learners started in Gr 1 and 334 718 passed matric 12 years later). Matric pass rates should be interrogated in terms of the number of learners who entered the school system, for a better understanding of how the system fails the learners.

A net estimated enrolment rate of 93-95% in primary school is comparatively high to Sub Saharan African figures (around 60%). This figure drops to 62-65% in secondary school (Lotz-Sisitka, 2010:7). However, it must be pointed out that the statistics provided by the Department of Education are unreliable as the department does not measure and monitor drop out, as confirmed by Panday and Arends in an HSRC review of 2008. For their analysis they compared the data of the Department of Education and the Community Household Survey by Statistics South Africa. Even then it is unlikely that a true picture emerges, given the tendency of schools to inflate numbers for improved post provisioning and the insistence of the department that no learner may be removed from the school data base without a letter from the parent. The latter is not always possible as families leave without forwarding addresses and learners are 'lost'.

One more aspect that hampers access will be discussed, namely financial inaccessibility. This is a contributing factor to dropping out of school.

2.4.2.3 *Financial Access*

The burden of school fees on the poor became untenable as, by 2002, the poorest households spent, 'on average, twice as much of their income on school fees as do middle-and high-income groups' (OECD, 2008:98). This burden is supported by a Thailand study that found the private costs of schooling in developing countries a source of educational inequity (Tsnag & Taoklam in Motala, 2005:52). To address the impact on poorer parents, no-fee schools and fee exemption regulations were promulgated.

Since 2006, 60% of public schools have become no-fee paying schools (first gazetted in 2005). No-fee paying schools may not charge school fees and therefore rely fully on provincial funding, which is inadequate as has been explained. Families with children in quintile 1-3 no longer have to pay school fees, but they still face the burden of school uniform and incidental expenses such as stationery where the state is not providing sufficient funds, and transport costs when they live far from school (the Scholar Transport Programme only provides transport to learners who have to travel from farms to schools, and then only in certain instances). For the poor, school fees are merely the last straw. This is supported by the Vuk'nyithate Research Consortium (VRC) findings cited by Woolman and Bishop,

(2012:57-27) that identified transport as the primary barrier to entry, in terms of financial accessibility. The VRC study estimated that it costs a family living out of walking distance from a school approximately R950.00 per year for all education-related costs as opposed to the on average R50 per year that school fees in poor schools would have cost them. School fees, therefore, are not the determining factor in financial inaccessibility. If the poorest households spend twice as much of their income on school expenditure than middle class parents do, then the financial burden of the full school package must be overwhelming and unattainable.

From the above it is evident that the current performances in South African education are not serving the stakeholders despite the fact that physical access to education has increased in South African schools. Increased access and increased funding have not led to improved teaching and learning (Fiske and Ladd in Le Cordeur, 2010:531), supporting the contention that underlying causes are not being addressed. The failure to address underlying causes is supported by Crouch and Vinjevold (2006) who state that increased access to education in other parts of the world did not lead to attrition. In Southern Africa, by contrast, the imbalance between access and quality is real. Countries with the highest access tend to be the highest achievers, except in Southern Africa, and particularly in South Africa. They conclude that ‘reconciliation of equity and quality is a matter of purposive policy’ (2). In the following chapters, I will argue that purposive policy could be successfully implemented if the ethics of complexity thinking and of identity formation are considered. The ethical implications of when, how and what we do also determine whether education is acceptable, in terms of the ‘Four As’.

2.4.3 Acceptability

Acceptability, the third ‘A’, refers to an education directed at the full development of human personality and to the strengthening of respect for human rights and fundamental freedoms. It means not violating the dignity of learners.

In the first instance, one would first need an understanding that education has to direct the development of the human personality to continuous actualisation. Education must go beyond the teaching and learning of subject content. It must broaden the horizons of the learner and

the teacher. It must not be limiting and limited, but should be enabling. We have seen from the outcomes tested by PIRLS and TIMSS that the South African public school system is not enabling to the majority of South Africans, not even in terms of basic literacy and numeracy. It does not provide the majority of learners with the sophisticated skills, let alone basic language and numeracy skills, required by the labour market for an equitable chance at employment. It does not encourage and develop a critical consciousness in learners and teachers. Notshulwana, Executive Dean of Arts, Nelson Mandela Metropolitan University, says (2012:26) that the greater the consciousness, the higher is the expression of one's humanity, yet this greater consciousness is being stifled by an education system that is perpetuating the systematic deprivation of people, a condition that was prevalent during Apartheid. Notshulwana uses the root of the word 'education', 'to bring forth or to bring up' as the reason why the first function of education is to provide identity when he states that, 'Identity is the consciousness of our true nature', (28). Identity formation will be discussed in chapter 3. Suffice it to say at this point that the 'miseducation' of blacks and whites by apartheid education, based on misinformation about the other, and on inequity, denied people the opportunity to emerge and create meaning in relation to the other. Unfortunately this 'miseducation' continues today, as we have seen.

Secondly, to test *Acceptability*, one needs to question whether education is directed at strengthening respect for human rights and fundamental freedoms, after establishing what those rights and freedoms are.

The South African Bill of Rights lists the human rights and fundamental freedoms of South Africans. Strengthening, or not violating, respect for such rights and freedoms would imply that the education system would not be party to a violation of such rights and freedoms, or that any stakeholder in education would use his or her power to influence another person unduly and to the detriment of the other. I will argue that an acceptable education requires an ethical approach framed by complexity thinking; it requires integrity of stakeholders; it requires an awareness of what went before and the impact the past has on the present.

Partha Dasgupta in *Morrow*, (2007:191) says, 'What is uttered makes no sense unless we have an understanding of what has not been spoken'. I would like to add to *what was spoken before*. I will argue that identity formation requires being placed within a historical context (one of the requirements of complexity thinking). It requires that we do not merely pay lip-

service to the historical struggles in South Africa, but that we are critically conscious of the effect it has on the lives in schools of today.

In terms of ‘what has not been spoken’, learners must become aware of what has been included and excluded, as they generally are impressionable and vulnerable to the views of those in power. Their critical consciousness has to be constituted, as will be seen in chapters 3 and 4, because they are more likely to accept the views of an adult and are often unable to distinguish between falsehoods and truth. Woolman and Bishop, (2012:57-31), quoting the Canadian Supreme Court, say:

The importance of ensuring an equal and discrimination free educational environment, and the perception of fairness and tolerance in the classroom are paramount in the education of young children. This helps foster self-respect and acceptance by others.

Notshulwana (2012:28) expands on this: ‘This fundamental “self-knowledge” is the basis for recognising oneself as a unique human being recognised by others as human and worthy of human respect’, which brings us to the concept of dignity, a fundamental human right in the South African Bill of Rights, and included under Acceptability.

I have shown that poor education is a poverty trap resulting in decreased employment prospects and earning capacity. What has not been discussed is the emotional impact of poverty and unemployment, what Swartz, Harding and De Lannoy (2012:29-30) call ‘loss of dignity and autonomy, of purpose and coherent structure to life (Bourdieu 1965), of a sense of safety and the onset of feelings of hopelessness’. She says the combination of material and emotional conditions of poverty ‘foment a people’s lack of understanding of their rights, and the absence of a sense of belonging’. Ramphele (in Swartz *et al*, 2012:36) refers to the ‘woundedness’ of black South Africans as a result of past injustices, e.g. colonisation and apartheid: ‘a socially induced inferiority complex, self-hatred, low self-esteem, jealousy of those seen to be progressing (both black and white), suppressed aggression, anxiety, and sometimes a defensive romanticisation of indigenous culture’. These past injustices are evident in the past and present inequality of the public school system, as discussed. Moreover, other tangible forms of discrimination and violation of rights exists, such as the

continued use of corporal punishment, initiation practices, and the prevalence of bullying in schools, but these will not be discussed.

If education is a poverty trap, as we have seen, then education today is also partly responsible for the loss of dignity and autonomy, the lack of purpose and belonging, the lack of identity, and it is partly responsible for the ‘woundedness’. Education therefore cannot be regarded as acceptable and therefore it does not appear to meet the requirements of the third ‘A’. This brings us to the fourth and final ‘A’.

2.4.4 Adaptability

Adaptability refers to the ability of the system to adapt to the needs of society, without compromising the rights of the individual, or, as Woolman and Bishop (2012:57-32) quoting from ‘The Right to Education’ (art 13) in a United Nations document, put it, education must be ‘flexible so that it can adapt to the needs of changing societies and communities and respond to the needs of students within their diverse social and cultural settings’.

This criterion is closely interlinked with *Availability/Adequacy*, *Accessibility* and *Acceptability*, all three of which are not being met by the present education system. Not one of the four criteria is more important than the other, but *Adaptability* highlights the vulnerability of education and its stakeholders to thinking and practices that negate or reduce the complexity of education. Market forces, in particular, result in the present leaning towards learners being regarded as little more than human capital. A curriculum driven by a human capital approach diminishes the person, be it the teacher or the learner, and contributes to the sense of alienation and lack of realistic hope. Curriculum changes, coupled with lack of resources, failed to recognise the full extent of historic imbalances and inequities and contributed to invalid assessment practices which affect black learners in particular, as will be seen. The phrase ‘needs of learners within their diverse social and cultural settings’ must also ring alarm bells, firstly because of the environments from which the learners’ needs arise and secondly because the interpretation of their needs by teachers and officials implies an openness and awareness that appear to be lacking when one considers the professional alienation of teachers, as will be discussed here and in later chapters. *Adaptability* therefore has to be approached with extreme caution.

The adaptability of an education system is determined by the curricula and intervention strategies it offers its learners. The curricula, according to Osberg (2005:81), is usually determined by the dominant culture when it ‘purposely shapes the subjectivity of those being educated’ (ibid). Intervention strategies are determined by assessment results; therefore it is an evidence-based approach. (These aspects will be dealt with in chapter 4). South African school education has seen more than its fair share of changing curricula and new interventions since 1994, in order to adapt to the needs of society and based on less successful practices. The Statement of National Curriculum for Grades R-9 was approved in 1997. This was a democratic, non-racist, non-sexist learner-centred approach using Outcomes-Based (OBE) methodology in Grades 1 to 9. Following this, the Revised National Curriculum Statement was introduced in Gr 1 to Gr 9, from 2004.

In 2006 the National Curriculum Statement (NCS) was introduced in Gr 10, while NATED 550 was being phased out. This meant that one could find three different curricula in a school at a given time. With the introduction of the NCS Standard Grade and Higher Grade were abolished. This was to counter the trend of black learners doing subjects on the Standard Grade.

From the outset OBE was met with resistance and training remained ineffective for the majority of South African teachers. OBE was pre-supposed on the existence of well-qualified teachers, well-versed in their subject matter (Chisholm, 2010:16). Ramphele (in Le Cordeur, 2010:529) says, ‘Teachers in poor schools, who are mostly under-qualified, [could not] make the transition to the new curriculum despite numerous training workshops’. She stated that OBE was out of touch with the realities of South African education and that it increased inequalities of apartheid and the division between rich and poor, resulting in further impoverishing education. Increased assessment activities resulted in teachers teaching on average 3,2 hours per week (Brescani in Le Cordeur, 2010:529) which merely exacerbated the inadequate teaching and learning taking place.

Apart from curriculum changes, various intervention campaigns were launched, such as Culture of Learning, Teaching and Service (COLTS) in 1996, which, according to Crouch and Vinjevold (2006:13),

aimed to address the erosion of time and disruption of teaching and learning that had become part of school culture in the late 1980s and early 1990s, during the period of struggle against apartheid. This was a necessary start to the quality campaign given secondary schools' involvement in the liberation struggle, during which slogans such as "liberation before education".

In 2001 a new campaign was launched to set national targets for pass rates and target time management and teaching and learning in underperforming schools. At the same time the Mathematics, Science and Technology Education Strategy was launched to improve the access of blacks to so-called gateway subjects. By 2003 there were signs that the campaigns were assisting in improving results, but there was a decline in the number of learners writing matric exams. Officials and teachers were responding to demands for better results by holding back learners in grade 11 (ibid). Moreover, the quality of the passes was poorer, especially in Maths and Science, despite cognitive demands in the papers declining. Umalusi, the controlling body of the matriculation examinations, stepped in and instructed examiners to improve the cognitive demand of papers in 2004 (12).

Since 2004 there have been numerous initiatives aimed at improving teaching and learning; the first being the NCS mentioned above. The second initiative was the National Learner Attainment Strategy focused on interventions to increase pass rates in poorly performing schools, especially black schools. This initiative was followed by a greater focus on the Dinaledi project to improve Maths and Science education (15). 2010 saw most of OBE being phased out with a greater focus on back to basics and mother tongue education for 5 years; as well as the introduction of CAPS, the new curriculum being phased in from 2012.

Teachers felt increasingly at the receiving end of the blame for poor results. They could not keep up with all the changes and felt alienated and powerless. Cereseto, (2010:28), headmistress of Parktown Girls' High and deputy chairperson of the South African Council of Educators, sums up the effect of curriculum changes on teachers,

The professional identity of teachers is fractured when they experience their work as meaningless and they feel unable to achieve what they believe are the goals of education. Their sense of purpose and worth are critically undermined to the extent that their commitment diminishes and they give up caring.

Teacher alienation cannot but impact on the effect teachers have on the identity of the learner as well as the teacher him/herself as identity formation takes place in relationships. If one party has given up and lacks direction and purpose, then the other party has a limited ability to self-actualise in this ‘miseducation’ milieu of Notshulwana (2012).

The notion of a learner-centred or child-centred education advocated by OBE and subsequent curricula also reduces teachers to being mere facilitators alienated from their professional roles, instead of actively involved in the process of teaching and learning, of producing knowledge. Morrow, (2007:207), says education should be ‘*learning-centred education*’, but I believe it should be *teaching and learning* centred where teachers and learners fulfil the roles of both teachers and learners, and thus develop their identities as teachers and learners, actively involved in co-creating knowledge, and critically engaged in the process.

In addition to being overwhelmed and insecure, teachers could not cope with the assessment demands. The workload proved taxing, and assessment standards were compromised. Instead of a gradual decline in the gap between national examination marks (at the end of matric) and the Continuous Assessment (CASS) year mark, the gap widened. Van den Berg and Shepherd (2008:18) say, ‘Declining examination marks were indicative of an increasing disparity between what was being taught and assessed within the schools, and what was being tested in the examination (in line with the national curriculum)’. Their report to Umalusi also found that assessment done by quintile 5 schools was more accurate. To recall, quintile 5 schools are regarded as the best resourced and wealthiest schools, with quintile 1 schools situated in the poorest of the poor areas. What is disconcerting is that teachers do not appear to be ‘seriously re-evaluating their own assessment standards on the basis of the examination marks’ (30), thereby continuing to weaken the link between curriculum standards and CASS. This is another example of the alienation between teachers and their professional responsibilities. The identity of teachers as complex beings working in a complex system must be re-established if we want them to be confident professionals who want to engage with what it means to be teachers and learners.

Assessment practices impact on learners, as Reddy *et al* (2012:3) state, ‘In the unequal South African school system, the rate of grade progression is considerably higher amongst students within historically White schools (Subsystem M) than amongst those in historically Black

schools (Subsystem P)'. In other words, Subsystem M learners were more successful in meeting the progression requirements of their grades.

Lam, Ardington and Leibbrandt, (2011:37) found that '84% of White students who were in Grades 8 and 9 in 2002 successfully advanced three grades by 2005 compared with only 32% of Black African students'. Lam *et al* (ibid) also found that grade progression of black learners was poorly linked to ability and learners meeting the progression requirements. Baseline literacy and numeracy scores were good indicators of grades 8 and 11 white and coloured learners' progression, but not so for black learners. Reddy *et al* (2012:3), referring to the Lam *et al* study, says,

In contrast, no racial differences were found in the relationship between baseline scores and passing the matric examination, which is nationally standardised. They therefore propose that grade progression within schools attended by Black children is characterised by a considerable degree of randomness, with the consequence of high enrolment despite high rates of failure.

Leibbrandt, director of the Southern African Labour and Development Research Unit (SALDRU) at the University of Cape Town, in a talk delivered at the National Arts Festival in 2007, likened education for black learners to a lottery as they can never be certain of the outcome or their ability until they reach the externally assessed Gr 12 examinations, nor are they aware of what the requirements for success are. This could be a contributing factor to the optimistic and unrealistic sense of hope observed in black youth, despite their alienation from their roles and expectations as learners.

The needs of the learners within their diverse social and cultural settings call for a flexible education. This does not merely mean inclusive education that provides support to disabled and child-headed households, or a scholar nutrition programme, as important as these initiatives are. It requires an understanding of the complexity of the current education system which is rooted in discrimination and inequality, and which appears to be perpetuating past inequities. It requires an awareness, according to Swartz *et al*, (2012:30), that 'poverty and inequality persist in part because of the internalisation of inequalities which still structure social behaviours', and to be aware that, what Swartz *et al* call, the 'progenetic' (ibid) function of legislated inequality in democratic South Africa, devastatingly ensured that the

‘effects of Apartheid remained and gave birth to new social problems, not least those of continuing inequality, poverty and insecurity’ (ibid). Despite the South African Bill of Rights and the Constitution, inequality remains legalized through unjust laws such as the *Norms and Standards Funding Act*. The needs of black learners are coloured by the persistence of the social, economic and political structures of Apartheid, and by the black youth’s tendency to accept the world as it is. They live in hope, unlike their peers in other countries, because they know no different as they have internalised the injustices; they are wounded, as Ramphela asserts. South Africa rejoices in its celebration of diversity and its coherence within social, political and economic systems, but it is a celebration party devoid of substance and reason as the reality for the majority of our learners and teachers is not cause for honest celebration. The oppressed of today should know that they are still being oppressed and disadvantaged, and they should have a sense of their own historic agency.

Education has not adapted effectively because it lost sight of the complexity of education. It implemented changes when South Africa was not ready, socially, politically and economically. In its haste for change, it lost sight of the importance of reflective speed and of the notion that, as a complex system, it unfolds in time, it has a history that ‘co-determines present behaviour’ and anticipates the future. Cilliers’ warning (2006:108) is apt when he says that memory is embodied in the system,

Memory is the persistence of certain states of the system, of carrying something from the past over into the future. It is not merely the remembering of something in the past as if belonging to that past, it is the past being active in the present.

2.5 A POSSIBLE SOLUTION: COMPLEXITY THINKING AND IDENTITY FORMATION

To propose *the* solution for redressing the inequities in education would reduce the complexity of education. There can be no doubt that teacher morale is important, and so is systemic leadership, values-based education, community involvement, inclusive education, the curricula and every other stakeholder and component of education. Too many interventions and initiatives have failed or are floundering because the approaches appear to have denied the complexity of education.

South African education is in a Catch 22 situation: if it does not change drastically and fast, it will lose another generation of learners. On the other hand, if it changes faster than the environment, the changes could merely be putting a plaster on its historicity and embedded memory, on its 'woundedness'. Such a change could at best be cosmetic and temporary as it does not allow the wounds to be opened and to heal. So what do we do, as we are fast running out of time and the luxury of 'slow-schooling' (Cilliers, 2006) and environmentally-friendly change? We look towards that which roots us as people: our identity. Identity emerges in the relationships between parties, be they people or institutions, but circumstances and conditions towards identity formation can be disabling or enabling. A disabling and disabled identity emerges from expedience, dishonesty and/or misrepresentation. An enabled identity emerges from a relationship of integrity, and is complex and rich.

I propose a start with the basics, identity formation, as it is in the first instance, the most localised interaction between stakeholders. This thread links the highest office of the state and the child in the private school; it links the head of state and the child in the mud school. The highest office of the state is accountable to that child; it is responsible for the consequences of its actions to that child, even if it cannot foresee the consequences. If the state has not successfully conceptualised and implemented basic education, yet promises basic education to all, how can the identity emerging from this relationship be one of integrity? Similarly, the teacher must be critically aware that she is not only responsible to the child in her class, but that, because of her interaction with the child at any particular moment, she is responsible to the children of the child in front of her. An alienated teacher is denying a parent, a child, a colleague, an official, an opportunity at emerging, enabling identity when she interacts with the individual. A learner who is unaware of the social, political and economic constraints and the impact thereof on his emerging identity, is being 'miseducated'. His disabled identity could be disabling to himself and others, unless an emerging critical consciousness through a rich diversity of interactions can impede the negative impact of a disabling relationship. In other words, a disabled identity has the self-organising capability to heal its 'woundedness', if rich diversity is present and critical consciousness emerges.

Herein lies the hope of the South African education system. Identity that self-organises despite distortions will enable the capability to experiment, to be resilient and to be creative.

Chapter 3: Complexity Thinking and Identity

3.1 INTRODUCTION

3.1.1 Context

The previous chapter dealt with the current state of South African public school education, in particular that of the schools previously disadvantaged under apartheid. It concluded that the education system does not measure up to the 'Four As' of the International Committee for Economic, Social and Cultural Rights, *Availability/Adequacy, Accessibility, Acceptability* and *Adaptability* (Woolman and Bishop, 2012:57-19 to 57-32), and that the system is currently denying the majority of learners their human right as enshrined in the Constitution of South Africa, that is, the right to a basic education.

It proposed complexity thinking as a framework through which to focus ethically on the complexities of South African public school education, while bearing in mind that exponential transformation is possible if identity formation in diverse relationships is enabled.

In this chapter complexity thinking and identity formation will be discussed.

3.1.2 Chapter structure

The first section on complexity thinking gives a brief introduction before moving on to the characteristics of complex systems, specifically the idea of a system, complicated vs complex systems, the nature and importance of relations, distributed representation and memory, emergence and self-organisation. This is followed by an explanation of the generative capacity of difference, the concept of boundaries in complex systems, and lastly, the ethics inherent in complexity thinking.

A conceptualisation of complexity thinking and an awareness of the need for radical systemic transformation in many spheres of society, but specifically in public school education, lead to the question of what a key factor could be that could unlock the possibilities inherent in

complex systems. My argument will be that the answer lies in what holds complex systems together, i.e. local interactions or relations, as Cilliers (2005a:142) states, ‘complex systems are held together by local interactions only’. Local interactions have the potential to give meaning and form identity.

For this reason, identity formation in complex systems is the next section. Identity formation is discussed in terms of its characteristics, and its ethical and political dimension. Under characteristics of identity formation, the following will be covered: identity formation as a relational and emergent construct, including individual and group identity.

This is followed by a discussion on the political and ethical dimensions of identity formation. This section also deals with identity formation as embedded in power because power permeates every aspect of society. Power is a determining factor in identity formation. The asymmetries resulting from power in discursive practice; in knowledge and knowledge creation; and finally, in social justice will be covered.

3.2 COMPLEXITY

3.2.1 What is complexity thinking?

In a time of disquiet, unsettledness and unpredictability, complexity thinking is an approach that acknowledges the transience of meaning, yet paradoxically gives hope as it acknowledges unpredictability and the power of the agent. It is an approach that says it is understandable to be uncertain, but it is not understandable to be paralysed into inaction. Morin (2005:29) puts it succinctly: ‘The intelligence of complexity, isn’t it to explore the field of possibilities, without restricting it with what is formally probable? Doesn’t it invite us to reform, even to revolutionize?’

Morin (2007) distinguishes between *general* and *restricted complexity*. Proponents of restricted complexity believe that by studying the processes integral to a complex system, the rules or laws of complexity could be uncovered (ibid); in other words, the complex system could be known. Morin (25) calls for general complexity that requires deep ‘reform’ of our way of ‘thinking and knowing’. General complexity theorists argue that because complex

systems are irreducible, one can never comprehend a complex system fully. Approaches to a complex system are limited and these limitations must be acknowledged. A complex system cannot be simplified into rules and laws. Should such simplification be possible, the system is not complex, or ceases to be complex. Morin (27-28) states that restricted complexity rejects generalised complexity 'because restricted complexity did not make the epistemological and paradigmatic revolution which complexity obliges'. He does not believe that complexity can provide a method 'to the world and anything' (28), as restricted complexity believes, but that complexity 'is a certain number of principles which help the autonomous spirit to know' (28), where knowing is understood to be simultaneously 'separating and connecting', analysing and synthesising (25).

Cilliers (2010b:vii-viii) says that an approach to complexity should acknowledge that complexity is 'a house divided'. Neither general complexity nor restricted complexity is right or wrong; they are different and embody different values. He supports general complexity but calls for the use of *critical complexity*, instead of general complexity, because critical complexity 'can employ all the ideas and tools from a wide array of approaches to complexity, but in a reflexive way'. How we approach a complex system, with what we do so, and the choices, frames, filters, zooms or models we use in the process, must be revised continuously, hence the notion critical complexity. Critical reflexivity is imperative if we acknowledge our human limitations and that our understanding of a complex system is provisional and based on our values; it is never final, complete or objective. As Cilliers (2010b:viii) puts it, 'The words "value", "ethics", "normativity", "power" and "politics" should feature much stronger in our reflections on complex phenomena than they do currently'. If we are critically reflexive, we know we cannot escape the ethical implications of who we are, what we believe and how we choose and do in a complex system, nor can we escape from the temporality of the who, what and how.

Methodologically, complexity thinking is a heuristic approach, that is, it is an approach to finding a solution, rather than a specific solution. Complexity thinking provides us with heuristic guidelines, instead of a specific set of guidelines or specific constraints (Cilliers, 2000:27). Preiser and Cilliers (2010:278) write that complexity thinking 'is ultimately not a strategy that aims at finding perfect solutions for unsolvable questions'. Rather, as stated by Richardson and Cilliers (2001: 22), it presents us with a conceptual strategy that 'helps us in coming to terms with the ethical problems associated with complex (social) systems'.

Complexity thinking is transformative as it allows for possibilities and transformation, as changes are spontaneous, unpredictable and emergent. As such it is enabling and allows for sense-making and giving meaning, well-knowing that such meaning is transient (hence it is anti-positivist).

Nilsson (2007:239; 244) likens complexity thinking to a filter that is used for pragmatic reasons. Complexity thinking as a filter makes it possible to filter away that which may be obfuscating or which may not add towards a useful, if transient, solution, but it does not allow one to forget the normative implications of filtering. For pragmatic purposes, one could also argue that a lens is needed to zoom in on a section of the complex system, or modelling is required. This brings us to the notion of modelling.

Modelling a complex system implies reducing the complexity of the system under study. If the aim of modelling is to help understand a complex system better and make better predictions, then an equally complex model would not help. Models are limited and therefore one has to acknowledge the ethical implications of the limits imposed and the subjectivity of interpretations. Woermann (2011) explains that for the proponents of restrictive complexity, modelling is a descriptive task as the rules and principles underlying the complex system have to be described. Modelling, in terms of general complexity, involves 'choices, judgements, and assumptions when deciding on the factors that are relevant in modelling complex systems' (ibid). Modelling for proponents of general complexity is therefore normative and cannot escape the ethical.

In the following section the characteristics of complex systems will be described, and from this the importance of using complexity thinking as a methodological framework will emerge, with the ethical implications of filtering.

3.2.2 Defining complex systems

3.2.2.1 *Idea of a system*

A system is comprised of interactions that can have various attributes. Interactions, whether between people, components, the environment and components or people, can be linear or lacking in diversity, in the first place, as in a non-complex system. Secondly, interactions can be rich and non-linear with many possibilities opening up, as one would find in a complex system. Non-linearity is the multiple bifurcations arising from the response of one person to another, or to a group, or to the environment, where no one can predict that an input will have a specific result.

An example of a linear interaction would be that between a match and the flint: if the match strikes the flint, it could break, light up, or fail to light up. The possibilities created by this interaction are limited, linear and not rich. They are predictable.

However, if I as a person were to be added to the interaction between the match and the flint, more possibilities open up as the interaction becomes rich and non-linear. I could decide to light a candle, or a fire that could burn down a building. My choice could open up unforeseen possibilities.

When these interactions between components are rich and non-linear, forks in the proverbial road are inevitable and choices must be made. Nilsson (2007:238) explains: 'bifurcation and choice exist within the situation, leading to the possibility of multiple futures and creative/surprising responses'. These possible futures and responses could be regarded as positive or negative (enabling or limiting/disabling) for the system, and could also be stultifying, as will be discussed in more detail later on.

Complexity is an attribute of a system that is not merely complicated as it has a diversity and quantity of components and relations, as referenced above. Let us turn to the difference between complicated and complex.

3.2.2.2 *Complicated vs complex systems*

Firstly, one should understand why the notion of complex, and not simple or complicated, is used. Something may appear simple, when it is complex, and vice versa. An example of a simple system is an internal combustion engine (Cilliers, 2005a:2). Cilliers states (viii-ix), 'If a system – despite the fact that it may consist of a huge number of components – can be given a complete description in terms of its individual constituents, such a system is merely *complicated*'. A complicated system is a simple system, as an action can only result in a pre-determinable effect. Interactions, therefore, are linear and non-spontaneous.

A complex system could consist of a large number of (often simple) different and related components, but the system cannot be described, explained or analysed in terms of one or more components. As such the system would have quantity and diversity of components and relations (Vesterby, 2007:251), and the quantity and diversity would be emerging and self-organising.

Nilsson (2007:247 and 238) regards a major performance indicator in a complicated system as efficiency whereas in complex systems one would work towards an effective, useful solution for problems, not by reducing the complexity but by handling complexity dialectically. The focus would not be on optimal configurations, as is the case in complicated systems, but on transformative changes in emerging situations and contexts, according to Nilsson. To unlock the transformational and enabling possibilities of a complex system, the system has to know itself in terms of what it is not. This generative capacity of difference will be discussed in this chapter.

It is important to distinguish between complex and complicated systems as one diminishes the possibility of transformation if a complex situation is perceived as complicated, according to Nicolaides and Yorks (2007:227). The reason is that if a complex system is seen as complicated, one would be reducing the system to its component parts to find optimal configurations towards a solution, thereby negating emergence and self-organisation in and between the relations of the component parts.

3.2.2.3 *The nature and importance of relations*

Relationships are fundamental in complex systems as they determine the nature of a complex system. It was noted above that simple or complicated systems have linear, non-spontaneous cause and effect relationships. Complex systems, on the other hand, have multiple, diverse components that interact non-linearly with one another. It is these interactions and relations that determine the complexity of a system, as Cilliers (2010a:7) puts it, 'The complexity of the system does not reside in the components, but is a result of these interactions'. What follows is a discussion of the following premises: firstly, the interactions are relationships of difference. Secondly, they are dialectical and historical, and thirdly, in human complex systems, these interactions stem from a need to belong. Lastly, the behaviour of the system is determined by the nature of the relationships.

Cilliers (7) calls the relationships between components of a complex system, 'relationships of difference', with the proviso that an element of sameness or similarity must be present for the components to be drawn to one another, that is, before a relationship can be formed. According to Cilliers (13) 'the element of identity *inaugurates* the play of difference'; it is what enables a relationship, and ultimately what enables identity formation of a complex system, as will be seen in the section on identity. Without identifying and being attracted by a commonality (despite the differences), a relationship cannot be formed.

Secondly, the relationship between the complex system and its environment (where the environment is another complex system) is both dialectical and historical. Dialectical is used in the Hegelian sense as a 'necessary process that makes up progress in both thought and the world' (Blackburn, 2008:99) by, amongst others, being and becoming self-conscious. The relationships between components of a complex system, and the complex system and its environment are also historical in that previous states or natures of the systems and components cannot be ignored. Not only is the system embedded in its history, but the components themselves are embedded in their individual histories. This necessarily affects the relationships between components, as well as between the complex system and its environment.

The dialecticality and historicity of a relationship of difference is an ongoing, active process of being different, with new differences and meaning emerging and being deferred. In other

words, this is a self-conscious, ongoing process by components of a complex system, and a complex system and its environment, in non-linear relationships, towards making progress and meaning. This brings us to the third premise: individuals in human complex systems form relationships because they have a need to belong.

In a complex system involving humans, human involvement and the paradoxes created in human interactions, are considered. As Nilsson (2007:238) points out, a complex system 'involves paradoxes that are both time and identity based on human perception, interpretation and action'. Identity is constituted in meaningful relationships, and relationships determine the nature of the complex system, therefore it must be concluded that relations are of paramount importance in complex systems. The question arises why individuals would go to the effort of entering into relationships when it involves such paradoxes and subjectivity. Bloch and Nordstrom (2007:16-17) emphasise the importance of relations in human complex systems when they cite Buber: the longing for relation is primary. As components of the system, individual components are embedded in a network of relations and have a longing for relation, in other words, belonging. It is this need to belong that draws them to finding elements of identity in the other so that relationships may be formed in a non-stagnant, ongoing, active process of difference, as stated above. It is these relationships that determine the behaviour of the system, which is the last premise.

Cilliers (2005a:122) states that complex systems are open systems that operate in conditions far from equilibrium. Complex systems 'need a constant flow of energy to change, evolve and survive as complex entities', and it can only survive as a process and is defined 'by what it is doing' (ibid). What it is doing, or the behaviour of the system, is determined by the nature of the relationships, which, as has been stated before, are unpredictable and indeterminable. However, a complex system cannot be separated from the environment in which it finds itself; it cannot remove itself from the environment if it wants to grow. For this reason it recognises and stores useful memory throughout its system so that emergence and self-organisation can take place, as discussed in the next sections.

The nature of these relationships is vital to the following characteristics of a complex system, that of distributed representation and memory, and emphasises the importance of relationships in a complex system, as distributed representation and memory enable the complex system to adapt to and cope in its environment.

3.2.2.4 *Distributed representation and memory*

Distributed representation and memory refer to the recognising and storing of useful and meaningful information concerning the environment for future use. For information to be recognised as useful and meaningful, an element of sameness has to be present. A system can only recognise sameness if it knows itself. De Villiers-Botha and Cilliers (2010:28) explain:

It stands to reason that if the system needs to function in a particular environment, it has to factor its knowledge of itself into its knowledge about the environment. It needs to be able to predict with relative accuracy how it will fare in the environment. This ability requires knowledge of itself that is fairly accurate.

Meaning of itself is constituted relationally and is the result of a dialectic and historical process, as mentioned above. The information that the system has of itself and confers upon the environment is stored in the memory of the system, throughout the system, and it calls upon this memory when it self-organises to deal with contingencies, as will be discussed in the following section. Suffice it to say that the information cannot be random as it has to be useful for the system to adapt to, and cope with, the environment.

3.2.2.5 *Emergence*

Emergence and self-organisation are defining features of complex systems. First, the notion of emergence will be discussed, before turning to self-organisation in the next section.

The components of a complex system interact with one another. Moreover, these interactions are not fixed, but shift and change. This can result in novel features, which often could not be conceived of or predicted or imagined before emerging. These novel features are usually referred to as emergent properties, emerging or coming forward from the interactions. Cilliers (2005b:258) refers to emergent behaviour as the ‘macro-behaviour’ of the system and says the macro-behaviour is a result of the micro-activities of the system. The focus is not on individual components, but on their relationships or interactions. For this reason, Cilliers says that ‘relational properties could be a better term to employ than ‘emergent properties’ (2005a:5, note 2). ‘The properties of the system *emerge* as a result of these interactions; they

are not contained within individual components' (Cilliers, 2008:44). They are not *a priori*, nor are they pre-determined.

It is important to note that nothing or nobody outside the relationship causes the complex behaviour of a system. There is no 'external telos or designer' (Cilliers, 1998:143), nor is there 'central control' between a complex system and its environment (De-Villiers-Botha and Cilliers, 2010:29). The complex system is constituted by the relationships or interactions of its components.

These interactions are non-linear, which means that there can be no certainty as to cause and effect between components, nor can consequences resulting from interactions, or from a failure to interact, be predicted or imagined. Even though the interactions have a fairly short range, the influence could be wide-spread and again cannot be predicted. Small causes can have large effects, and vice versa, as outcome is not only determined by the scale of the cause but also by the context of the system. Cilliers (2005a:98) refers to these phenomena as the 'emergence of large-scale features when there are only local interactions among units'.

Because of the unpredictable consequences of the non-linear interactions, a complex system cannot be reduced to its components as one cannot be certain of the consequences this will have on emergence. For this reason reductionism fails because it does not recognise that when a complex system is taken apart, emergent properties are destroyed. Cilliers (2010a:16) writes as follows on the irreducibility of a complex system, 'If the organisation is seen as a complex system, every aspect of it contains normative elements'... 'Ethics'... 'is a result of the non-linear play of differences which cannot be reduced to a final or objective description. Which differences are allowed to flourish, how much structure is required, how the identity of the organisation is conceived, these are all issues which cannot be reduced to calculation' because one can never be certain of the cause and effect of the non-linear relations between components, and the relational or emergent properties that could emerge. (Complexity and Ethics is discussed in more detail in 3.2.3).

The interactions between components are not only non-linear, they also have loops in the interconnections. Without looped feedback a complex system cannot have continually emerging properties, and, in the case of human complex systems, it cannot reflect upon and

transform itself (Cilliers, 2005a:121); it cannot be critically reflexive, as mentioned in the first section of this chapter.

With regard to the human impact on complex systems, it is also important to heed the warning of Swilling, Roux and Guyot (2010:217): ‘Emergence implies patterns that can be anticipated and therefore *promoted, modified, initiated or suppressed by whoever may have interests in particular outcomes* depending on their location within particular nodes in the networks’ and further, ‘emergence implies the presence of structure and this, in turn, potentially creates a discursive framework for yet another threatening act by *those with power* who claim to know and who search out and co-opt any suggestion of a normatively preferred future’ (my italics). These asymmetrical non-linear relations are, however, important for the emergence of properties as stated by Cilliers (2005a:120), ‘Non-linearity, asymmetry, power and competition are inevitable components of complex systems. It is what keeps them going, their engine’. Cilliers (ibid) calls for the exploitation, not of individual components in a non-linear asymmetrical relationship, but for the exploitation of the ‘magnifying power of non-linearity’ which emerges through ‘a rich level of interaction and by the competition for resources’.

At this stage it should be pointed out that, when applied to the human domain, complexity thinking has ethical implications and requires morally competent subjects, critically conscious of asymmetrical power relations and the unpredictability of consequences. There is no choice but to enter into the agonistics of the complex networks (Cilliers, 2010a:9), in order to ‘generate the kind of meanings that are durable and enjoy a sense of validity and legitimacy, precisely because they are embedded within complex networks rather than captured by powerful elites’ (Swilling, Roux and Guyot, 2010:218).

Paradoxes, or contradictory ideas, could emerge simultaneously in complex systems and can neither be eliminated nor removed. What and how the paradoxes are perceived is a matter of knowledge and knowing, according to Nilsson (2007:239) who quotes Hempel and Oppenheim, ‘Emergence’ ... ‘is indicative of the scope of our knowledge at a given time; thus it has no absolute, but a relative character’. Just as we have to acknowledge the normative implications of using complexity thinking as a framework for pragmatic reasons, we have to acknowledge that what we perceive to emerge from a complex system, is limited

by our knowledge at that time. The implications this has for education will be dealt with in the following chapter.

What is certain, is that emergence is ‘no friend of certainty’, as Swilling, Roux and Guyot (2010:218) put it. Emergence within a complex network, between morally competent subjects, can generate valid and legitimate meanings, as long as the transience and subjectivity of such meanings are acknowledged.

3.2.2.6 Self-organisation

We now turn to self-organisation, which, according to Cilliers (2005a:89) is instrumental in how the structure of a complex systems comes about, develops and changes in response to its history, its present state, and its environment. Cilliers (90) provides the following working definition of self-organisation:

The capacity for self-organisation is a property of complex systems which enables them to develop or change internal structure spontaneously and adaptively in order to cope with, or manipulate, their environment.

The ability of the system to self-organise into a distributed form of internal structure is contingent upon the ability of the system to ‘satisfy a number of constraints’ (89). Before turning to a discussion of the constraints, it is important to note that constraints do not only impede as the term would suggest; constraints are enabling and, according to Cilliers (2001:139) provide an ever-changing ‘framework that enables descriptions to be built up around it’.

This ever-changing framework is the structure and hierarchies that result from the interactions and self-organisation of a complex system, yet the structure and hierarchies themselves are enabling constraints towards the optimisation of the complex system. It has been noted before that complex systems have asymmetrical structures. These structures have certain functions and in order to perform these functions, hierarchies must be present (143). The hierarchies emerge over time, are well-structured but are not permanent, and interpenetrate one another as relationships exist between different hierarchies. With their

‘cross-communication’ (ibid) hierarchies contribute to the adaptability of the complex system to the environment (143). Moreover, a vital system transforms hierarchies themselves as the context changes. This is necessary as meaning is transient and therefore some hierarchies may become obsolete (144).

A condition for self-organisation is that the system as well as the hierarchies within the system must be complex for self-organisation to take place. In other words, the system must be open and allow for non-linear interactions and reflexivity. The system must be in a state of uncertainty, flux and non-equilibrium, with a diversity of components that allows for competition and vying for resources.

Cilliers (2005a:89) says the structure is neither a passive reflection of the environment, nor the result of pre-programming or an external designer, but the result of a ‘complex interaction between the environment, the present state of the system and the history of the system’. While complex systems are adaptive in that it can ‘respond to external events on all possible scales of magnitude’ (Cilliers, 2000:26), the systems self-organise without external agents. The response to the environment comes from within the system, it transforms the system, and can affect the environment, to which, in turn, the complex system will respond. In order for the complex system to self-organise it must draw on its distributed representation and memory stored throughout the system.

According to Cilliers (ibid) a complex system not only self-organises, but does so towards a critical state so that it is maximally sensitive to events that are critical to its survival, or as Cilliers (2005a:97) also puts it, ‘A self-organising system will try to balance itself at a critical point between rigid order and chaos’. As the system self-organises towards criticality it moves towards optimising the organisation. In the process it becomes more complex (98) and transforms itself, enabling its components towards increasingly complex optimisation through looped feedback and reflexivity.

The importance of emergence and self-organisation cannot be over-emphasised, because of the relevance of their relational characteristics on identity formation, learning and teaching, and *vice versa*.

3.2.2.7 *The generative capacity of difference*

Differences are located in the complex system itself, between components, but also between different systems and between the system and its environment. The relationships between components of complex systems are relationships of difference. One could therefore say that differences are inescapably part of the life world, and constitute complex systems.

An awareness of differences could result in an understanding that the differences constitute a complex system (Cilliers and Preiser, 2010:vii), and that in its richness and promise lie the endless possibilities. These endless possibilities are inherent in the properties that could emerge from the non-linear interactions and relations between the different components, and between the system and the environment. This is the generative capacity of difference, and the reason why difference and diversity are essential.

Difference has an ambiguous position in a complex system: it is a pre-requisite for meaning in a complex system, and it ensures that meaning can never be fully specified as meaning continually emerges. Meaning is deferred or never specific, it is always contingent, as differences are never-ending. (At this stage it must be pointed out that meaning is only possible when differences are confined or constrained, but this will be discussed in more detail under 3.2.2.8).

Meaning can never be fully 'present' to a system, 'at most it contains traces of other elements, which in turn consist of nothing more than traces' (Derrida, 2004, quoted in Grebe, 2010:96). Meaning, or knowledge, is therefore limited, incomplete and deferred, and these limitations must be acknowledged. This has implications for how we go about with the endless possibilities inherent in difference. We cannot be arrogant in the face of such possibility, nor should we be overwhelmed by it. Trying to understand a complex system calls for a sense of humility, or as Cilliers says, it involves a certain modesty (Cilliers, 2010a:8).

Difference can only be recognised as other, or different, if there is an element of sameness, or similarity. Cilliers cautions (12), 'in order to recognise the other as other at all, some form of identity between the self and the other is required'. This element of sameness, '*inaugurates* the play of difference on the one hand, while on the other, it is the result of that very process'

(13). Recognising the different is the moment of negativity; it is becoming aware of the *what is not* in terms of *what is*. Grebe states that without this negativity there can be no hope of a better future (2010:97). He equates the moment of reflection in thought with the moment of negation – ‘it is more than an epistemological operation to ensure greater “truth” and validity’, it is the central task of philosophy (102). Hegel, quoted by Grebe (95), puts it as follows: ‘Difference is the negativity which reflection has within it’. It is this negativity that is generative as it constitutes meaning (and therefore identity, as will be seen in the next section of the chapter). It contains the possibilities of aspiration and hope, and therefore for transformation and enabling conditions. Belmonte (according to Grebe, 97) says that an attitude of negativity must be understood in the ‘affirmative’ sense, as an ‘active differencing that opens up the possibility of experience, language, decision and judgement’. How these differences are approached and reacted to, in other words, how the relationships of difference are constituted, are determining factors for hope and identity, and the ethical.

Cilliers (2010a:16) states that components within a system should have freedom to experiment, yet this freedom should be dynamically constrained. A balance between freedom and constraint will lead to new differences emerging and an ‘excess’ of differences, which are ‘an investment in the future of the organisation’ (ibid). Peter Allen (quoted by Cilliers, 2010a:14) calls this the ‘law of excess diversity’. The extent to which a system embraces excess differences not only helps it cope and strengthen its resilience in a complex world, but determines its capability to experiment, to take risks, to be creative and imaginative. How we engage with risk, is ‘a function of the quality of our imagination’ (Cilliers, 2005b:264).

Woermann (2010b:185-186) argues that diversity and difference in a complex system allow us to ‘engage in activities that stimulate proactive moral imagination, which, in turn, allows us to think in novel and creative ways about the future’. She states that proactive moral imagination must be conceptualised as critical projection into the future, and that it needs an environment of autonomy, trust, and freedom from interference (within a complex system of difference and diversity). This is a challenging situation because we have to take risks to engage with difference, and to take risks we need imagination stimulated in enabling relationships of difference. This is because only then an ‘active differencing that opens up the possibility of experience, language, decision and judgement’ is possible, according to Belmonte (Grebe, 2010:97).

Regardless of how we choose to engage with difference, the possibilities that can emerge through difference are unlimited. Such possibilities can be overwhelming unless one accepts that constraints or boundaries, requiring a normative decision, must be present for the possibilities to be actualised (Cilliers, 2010a:10).

3.2.2.8 Boundaries

A complex system is an open, irreducible system with unpredictable, emergent properties. In order to understand the system, or for the system to have functionality, boundaries must be determined. Boundaries are required at an epistemological level (in terms of a description of the complex system) and an ontological level (in terms of the functioning of the complex system in the real world) (Cilliers, 2010a:8).

Cilliers (2001:142) warns not necessarily to think of boundaries in spatial terms, but in terms of virtual space. Firstly, this implies that components of a system interpenetrate other systems simultaneously and that they ‘share internal organs’. It is therefore not possible to speak of boundaries in spatial terms only, or as a physical line in the sand or on an organogram. Boundaries must be permeable and open to relations with other systems.

Secondly, the implication is that one is never far from a boundary in a critically organised system; there is always a ‘short route from any component to the “outside” of the system’. It is possible for the boundary to be ‘folded in’, or for a system to consist of boundaries only (142). One must therefore guard against referring to the centre of a system or the nexus of a system, or of inside and outside the system as one can never be certain. Boundaries act as an interface that participates in constituting the system and the environment (141). As an interface boundaries are relational and play an underpinning role in identity and meaning.

That one ‘draws’ boundaries is inescapably part of complexity thinking. Boundaries enable the complex system to be, it is constitutive of the system and it facilitates interaction between the system and the environment as it does not close the system to the environment (Cilliers, 2010a:8). Without boundaries confining differences, the generative capacity of difference would be curtailed, as discussed in the previous section. Cilliers (9) says complex behaviour

is only possible when the behaviour of the system is constrained, but warns that a fully constrained system has no capacity for complex behaviour.

Where one ‘draws’ the boundary is in part a subjective, normative decision that will have unpredictable consequences. Boundaries are the product of judgement and not an objective given, and as such constitute that which is bounded (Cilliers, 2001:141). Luhmann puts it, boundaries are not neutral, they are not ‘objective reality, but our own observations’ (in Woermann, 2010a:122). The power inherent in the subjectivity of a boundary is further underlined by Woermann’s assertion (ibid) that boundaries are ‘contingent upon the resources at our disposal’, where resources are taken to include financial resources, language ability, creativity and ability to take risks.

Boundaries will and must be re-drawn continually as differences and changes emerge. Complexity thinking is a reflexive, transformative approach, hence the continual interrogation of boundaries as new needs for, and functions of, boundaries continue to emerge. The boundary is the subjective choice, with the choice itself shifting to the periphery where the boundary, at any moment in time, is perceived to be. It is the lens or filter that is either enabling or limiting/disabling; it is reflected in the narratives of a complex system.

3.2.3 Complexity and ethics

We constitute ourselves relationally in our various communities; and have always done so, despite the thinking in previous times. We do not constitute the world in terms of ourselves as thought in medieval times, nor as the self-conscious beings of modernity, nor in theological terms, but as complex beings in complex times.

This is done by making choices which determine the nature of the system. These choices ought to be made responsibly, in awareness that we are ‘contextual, embedded and historical beings’ (Hattingh and Woermann, 2008) and that we cannot foresee or predict the consequences of our choices. We take responsibility for this ‘unknowable future’ (Derrida in Cilliers, 2005a:139). In order to make a choice, we have to engage with ‘the contingency of the problem by entering into the “agonistics of the network”’ (Cilliers, 2010a:9). An individual in a system cannot escape the fact that he/she is not yet fully aware of the emerging properties of the actions, or use that as an excuse for not making a choice: ‘there is

no overarching theory of complexity that allows us to ignore the contingent aspects of complex systems' (Cilliers, 2005a:ix).

Taking responsibility for choices leading to an unknowable future and consequences we cannot foresee demands an awareness and consciousness different from the requirements of divine command theory, where ethics is grounded in the commands of a god or gods, or foundationalism, where knowledge is structured upon secure foundations. These tenets cannot hold true in complexity thinking as there cannot be a central, omnipotent controller, nor can knowledge be secure and certain. An ethics based on duty, on doing what is right, and on rights, would comply with the requirements of deontology, but it is debatable whether it will satisfy the morally competent person of complexity thinking. Similarly, a consequentialist approach where one's ethics would lead to the best possible outcome for the greatest number would be found wanting as a choice in favour of the majority is not necessarily the ethically best choice.

A proponent of complexity thinking would follow ethical principles '*as if they were universal rules*' (Cilliers, 2005a:139), not blindly as per modernism, but responsibly as a '*morally competent subject*' (Bauman, 2006:203) and an interpreter, remotivating the '*legitimacy of the rule each time we use it*' (Cilliers, 2005a:139). The system has no blue-print to follow, nor does it have '*inherent or a priori principles*' to guide it (De Villiers-Botha and Cilliers, 2010:28). One's self is the '*ultimate ethical authority*' (Bauman, 2006:xxii), yet while the ethical '*tasks*' of individuals grow, the '*socially produced resources to fulfil them shrink*' (ibid).

Relativism and foundationalism are untenable and '*ethics has become a matter of individual discretion, risk-taking, chronic uncertainty and never-placated qualms*' (xxiii) while one always has to guard against imposing one's beliefs on others. According to Bauman (xxiv), this means that '*[e]xistential insecurity – ontological contingency of being – is the result*'. The absence of shelter and security can be overwhelming when we accept that we no longer have a universal truth to guide us. However, in a complex system there is no choice but to accept this space of ambivalence. '*The social management of morality is a complex and delicate operation which cannot but precipitate more ambivalence than it manages to eliminate*', (Bauman, 1993:13). There are no clear-cut answers and options, yet choices have to be made.

We cannot escape the responsibility to the other even if we withdraw into seclusion; nor can we escape that we are constituted by our ethics - our values and insights - that emerge as a result of our practices and through interaction with difference (Cilliers, 2010b:vii). We therefore also cannot escape the responsibility to ourselves and our identity which emerges as a relational construct. Nor can we escape that our choices affect other open systems and ‘reverberate through these systems, ultimately feeding back into our own “system” again’ (Hattingh and Woermann, 2008).

Acknowledging complexity leads to the Provisional Imperative, an imperative to reinforce and promote a critical attitude. The Provisional Imperative is ‘served by the mechanisms of provisionality, transgressivity, irony, and the imagination’ (Woermann and Cilliers, 2012:448). These mechanisms are explained below.

The provisionality of the imperative refers to the contingency and continual revision of all knowledge claims we make: meaning is generated through models, which are ‘contingent in time and space because they are the product of the resources at our disposal, the choices that we make, and the influences that act upon us’ (451). Our models necessarily include and exclude. Since time and space and participants change continuously, knowledge claims must be revised, which means all knowledge claims are provisional (451). Yet as morally competent subjects it is imperative that we make claims, well-knowing that the claim is provisional and that our models are exclusionary. Woermann and Cilliers (ibid) state, ‘Thus the provisional imperative stipulates that we must be guided by the imperative, whilst simultaneously acknowledging the exclusionary nature of all imperatives’. It calls for a state of mind, or an openness to ‘a self-critical rationality, to respect diversity, to be willing to revise our models and to guard against the naturalisation of these models’ (ibid). In other words, it calls for the subject to be open to complexity, to be a permeable interface or boundary.

Secondly, choices must be transgressive, open to the possibility of more choices opening up, but it is imperative that choices are made knowing that those choices are provisional as more choices will emerge and meaning is always deferred. Transgressivity ‘demands bold action’ (453) and ‘a violation of accepted or imposed boundaries’ (ibid), but this boldness and violation of boundaries do not stem from arrogance. It requires modesty and humility to recognise the possibilities inherent in the diversity of a complex system (ibid). Woermann

and Cilliers further state that being transgressive is not only ethical, but also political, as one has to remain ‘vigilant and open to diversity and to the future, whilst *simultaneously* exercising choice and taking in a position’ (454).

We cannot escape the fact that ethics and politics have power implications as the boundaries we draw are choices we make. Our choices are subjective choices based on our experience, knowledge and identity. Through our choices we include and exclude. Woermann and Cilliers (ibid) state, ‘In making choices, we leave out certain considerations from our models, and in the social realm, these considerations may include the interests of stakeholders, who – in terms of our model – become the non-existent’. Those stakeholders become the outsiders, by our choice. These outsiders, or the non-existent, become insiders when included within the boundaries. Through the choices we make we give a voice to the voiceless, or not; we give existence to the non-existent, or not. This is inevitable as no conceptual schema can include everyone’s interests. It is a consequence of modelling that we have to exclude. The imperative is to be transgressive by conceding

to the inextricable ways in which our lives are constituted by the systems of meaning in which we partake, whilst nevertheless remaining vigilant of the fact that we have both a duty to continually break open and transform these systems in order to account for the non-existent, as well as a duty to take responsibility for our positions – even when they have undesirable and unforeseen consequences (455).

The imperative to take action is firstly provisional, secondly transgressive, and thirdly, it is ironic, as Woermann and Cilliers point out (455-456). Irony is generally accepted as a literary device to state the opposite of what is meant, often used to ridicule or make fun of. Woermann (2010a:213) says irony introduces an element of contingency and play into literal, objective language. Irony helps us deal with the contingency of complexity as we improvise and transgress boundaries with ‘social virtuosity’, with imagination and by taking risks (Woermann and Cilliers, 2012:457). The Provisional Imperative is clear: make the choice, yet complexity implies an awareness of contingency. In a world of overwhelming contingent complexity, irony not only draws ‘attention to the status of our strategies’ but it ‘lightens the burden of self-awareness’ (ibid).

The fourth and final mechanism that serves the Imperative, is imagination because imagination is what makes it possible to engage with and create ‘a future we cannot calculate’ (ibid). Woermann and Cilliers (458) define imagination as ‘the generation of excess variety’; it calls for excess diversity so that the other or another way of doing and being can be imagined. Imagination not only serves the Imperative, but, like transgressivity and irony, contains an imperative in itself. It is imperative that we develop, foster and nurture our imagination, psychologically and socially, by engaging with the arts and through dialectical processes (ibid). The latter is an important component of identity formation and will be dealt with in more detail in the next part of the chapter.

Choices could lead to mistakes, yet this awareness does not absolve us from employing the Provisional Imperative to make choices, and to be reflexive. Preiser and Cilliers (2010:274) state that ethics will be involved in complexity, but complexity

does not tell us what the ethics actually entails. The ethics of complexity is thus radically or perpetually ethical. There is no *a priori* principle we can follow nor utility we can compute. We do not escape the realm of the choice.

We have to choose, despite knowing that we cannot get it right (270). The Provisional Imperative demands that we act and ‘remain cognisant of other ways of acting’ (Woermann and Cilliers, 2012:459). Our truth is not necessarily the truth of the other, nor is it fixed. Choosing on this basis makes one vulnerable and calls for trust (ibid) in identity formation, as will be discussed in the next section.

Critical complexity is a constant reminder not to be too sure and to remain humble at the interface of possibilities. Components within and between systems interact and meaning is continually derived from these interactions that are dialectical and historical, as noted before. Complexity thinking also forces us to re-think traditional cause and effect relationships between the actions of an agent and the system, as Woermann (2010a:125) says that ‘the focus of any ethical analysis should not be on individual agents, but on relations between individuals and the systemic properties that emerge from these relations’. However, she points out that intentional and unintentional actions of individuals result in patterns of behaviour, which (ibid)

lead to the emergence of systemic structures. Systemic structures, on their part, serve to constrain the behaviour of individual components through feedback loops, but also create opportunities in the structure and thereby facilitate purposive action... Over time, these feedback loops reinforce or undermine certain patterns of behaviours, which then become institutionalised in formal or informal rules, norms, policies, laws, etc. *Radical systemic transformations are, however, possible due to the non-linearity* (my italics).

This means that the consequences of the actions and choices of an individual upon a system cannot be predicted, but individuals ‘can, nevertheless, help shape and transform our systems through engaging in “morally imaginative arrangements” that “emerge through dialectical processes that are influenced by actors’ relative power and political skill” (Hargrave in Woermann, 2010a:125). The use of ‘relative’ underscores that the playing fields are unequal and that contributions to dialectical processes arise from difference. In this difference lies the strength of moral imagination, on the one hand. On the other hand, one should beware that unequal power relations do not stifle the dialectical processes.

Woermann (2010a:125) says that we cannot separate ‘what ought I to do?’ and ‘what type of person should I be?’, given the embeddedness of our practices and identities. The question arises whether one can think about the ought and the should without being a critically conscious and morally competent person.

Our understanding of complexity and the ethics of complexity impacts on how we become and how we constitute our identities in relation to the other. It impacts on how we take responsibility for the other, in particular the other in close proximity to ourselves at any given time. The ethical choice is situated in the most direct relationship at any given point in time, that relationship that will assist with the contingency that has arisen. It is in these relationships that radical systemic transformation can be actualised, the consequences of which cannot be foreseen, but which the Provisional Imperative compels us to imagine. For this reason, the next section deals with identity in a complex system.

3.3 IDENTITY

3.3.1 Identity and complexity

Identity will be discussed as being an attribute of a complex system, where a complex system could be a human being, an institution or any other system meeting the requirements detailed in the previous section. For consistency, the term system, or complex system, will be used.

A succinct definition of identity is that of De Villiers-Botha and Cilliers (2010:35): identity is ‘a narrative distilled from the multiplicity of possibilities available from the world of experience’. Identity is emergent meaning and is constituted in relations. Because of the complexity inherent in the relations in a complex system, identity is always deferred. For the critically reflexive system open to a richness of diversity and relations, identity has endless possibilities of becoming and of being enabling and transformative.

Cilliers (2010a:5-14) says that relationships of difference constitute complex systems and identity is the result of these differences and interconnections as identity is emergent, not *a priori*. Suffice it to say that identity is inextricably intertwined with difference. Identity and difference mutually imply each other in open dialectics, because a system knows who/what it is through an awareness and understanding of who and what it is not.

Like a complex system, identity formation is relational (see 3.2.2.3). We are embedded in relations, as Trueit and Doll Jr (2010:138) say, ‘Our *Being* then, as Martin Heidegger (2008, 2002) reminds us, is always in relation, we are always “be-coming”’, in other words, we are always emerging in our relations. Without being in a relationship, inside the system, or with components outside the system, there can be no identity formation. The system could have a perception of its identity in terms of what it is and stands for but without engaging in and reflecting upon relationships, there is little chance for transformation and enabling relationships. It is in the interaction between systems that meaning with its potential to change continually, is created, as Nilsson puts it (2007:238): ‘In interactions between people coherent patterns of meaning are perpetually created’.

These interactions are the first ‘step’ of the system knowing itself in terms of what it is not, that is, forming its identity, and in the process, emerging critically conscious and aware of the conditions that are perhaps not of their own choosing. Stacey (2003), quoted by Nilsson (2007:238) asserts that the only levels separating systems, are ‘paradoxical processes of individuals forming the social while at the same time being formed by it’. Nilsson (ibid) sums it up:

The iterative results of these processes [of identity formation] are paradoxical situations where the interests of different groups of people are continually creating opportunities, at the same time as these processes restrain the developments of other processes.

I will argue that the relational aspect of identity formation is the cornerstone to hope and transformation. The relational is the key to an emerging identity that is either enabling or disabling/limiting. The relational is the key because our need to belong; to be part of a system is primary. The question that arises is what determines whether a relationship is going to be enabling or disabling/limiting. My contention will be that the answer lies in a critical consciousness of complexity and the ethics of complexity.

Consciousness of the self is emergent; it is the ‘result of transient patterns in this network of traces, which we organise into a (temporary) narrative’ (De Villiers-Botha and Cilliers, 2010:35). It is not *a priori*, nor is it a source or the cause of the experiences of the self. Through emerging consciousness and identity we give meaning to our experiences in relation to the other, that is, we constitute our identity.

Identity cannot be referred to in any other tense but the present (perfect) continuous tense. It is happening, being created, becoming, being constituted through a ‘play of a specific, contingent, historically determined and changing set of differences, it is not a “source” in itself’ (36). A complex system is not born with an identity; identity emerges from and in relations of difference.

The term ‘identity’ is usually used to refer to the self-identity or individual identity of a system in relation to others and/or the environment. However, it could also refer to collective or social or class or institutional or corporate identity, where the individual has a self-identity

and an identity as being part of or belonging to another system. For the sake of brevity, the term *group identity* will be used to differentiate from *self-identity*, but it must be noted that group and self-identity are interdependent as identity is a relational and emergent process.

Group identity usually stems from the need to belong in and through relationships and brings to prominence inclusion and exclusion which was discussed in terms of boundaries in 3.2.2.8. Woermann references Paulsen (2010b:173) to explain that in certain conditions, group identity, as opposed to individual identity, ‘can become more salient’ and ‘leads to behaviour that is based on group membership rather than individual characteristics.’ Woermann calls this the double identity (2011). She cites Morin (1992): this double identity is premised on both a diversity and unity principle. Each component in a complex system has its own unique identity and as such is irreducibly different from the whole. This is the diversity principle. Woermann (2011) says ‘the coupling of components also gives rise to a common identity (the unity principle) which constitutes their citizenship in a system’.

A balance between the two principles is essential in complex systems: without the diversity principle, thinking becomes increasingly homogenised; without the unity principle thinking loses a sense of unity (Morin, 1992). The implications of an imbalance will be discussed in more detail in the final chapter.

3.3.2 The ethics and politics of identity

A system cannot escape its embeddedness in social conditions, nor can it escape its relations to the other. The role of identity in social transformation and justice therefore cannot be ignored. Identity is always embedded in social conditions, and therefore has political implications. It is largely due to the fact that identity has political implications that we should be concerned with the ethical dimension thereof. The question that arises is how far does or should one’s ethical responsibility reach.

Richardson, Gregory and Midgley (2007:238) state that processes and phenomena that involve humans are

a complex network of living, innovative, creative, and evolving creatures which react and adapt dynamically to their perceived environment, and try proactively to create what they themselves, or collectively with others, find to be beneficial to their own interests.

Is one only responsible for one's own interests, or does one have a responsibility to the other. Am I my brother's keeper? The answer, I believe, is yes. In the first instance we are our own keepers, but we can only do so in relation to the other. In terms of complexity thinking we are responsible for the unpredictable consequences of our actions. Our choices and actions necessarily impact on our 'brothers' (and sisters'), therefore we are our brothers' keepers. We cannot make choices for our brothers, nor can we predict how our brothers will react, yet we must make ethical choices because we know our choices and actions impact on others, and influence their identity.

Not making choices impacts on our own identity formation, as well as the identity formation of the other, as we have seen. This is particularly important if the other suffers from injustice, as Arnott, quoting Willis (2003:99), asserts, 'To contract out to the messy business of day-to-day problems is to deny the active, contested nature of social and culture reproduction: to condemn real people to the status of passive zombies, and actually cancel the future by default'. We have to involve ourselves in the 'messiness' of injustice because we must create enabling relationships with the other, especially the marginalised other.

Ethics constitute a system, and it is constituted through the choices individuals in a system make. The main questions asked by De Villiers-Botha and Cilliers (2010:38) are: With what narrative does the system work? How does it constitute its identity and does it correlate with the changing environment in which it operates? Its identity is formed by how it answers these questions. 'Accepting the responsibility for the answer, and for how it affects others, is not a burden we have to bear, it is what makes us who we are,' (ibid). The Provisional Imperative of identity formation is that choices should lead to emerging, enabling and transforming conditions for the self and others, just as the Provisional Imperative of complexity thinking is a demand towards emerging, enabling and transforming conditions.

Power permeates every aspect of society, sometimes overtly, sometimes obliquely. Foucault, quoted by Baskin (2007:3) states that power is everywhere as it is '[a]n intricate force field

that links any group of related human beings and that, in its integration with society's current state of knowledge, drives the evolution of their institutions'.

Foucault, according to Baskin (ibid), asserts that power dynamics reflect the inequalities in society. The inequalities of society are therefore inextricably part of the components and systems, and cannot but affect identity formation. To this effect, De Villiers Botha and Cilliers (2010:36) state that 'identity can also not be separated from its embeddedness in social conditions', that is, identity cannot be separated from the inequalities of social conditions. Woermann (2010b:176) also asserts that asymmetry characterises interconnections between components in a system, and that – in social terms – these relations of asymmetry translate to relations of power.

That power affects the essence of the system, its identity, is underscored by Rouse, (Baskin, 2007:3) when he says that power resides in the field of relationships. Identity, constituted in relationships, has power mixed into its stone and mortar. Foucault (ibid) refers to the 'microphysics of power'¹ as the basic material from which human systems emerge.

Power is embedded in systems, in the discourses and narratives, in the relationships and the language; it is everywhere. More importantly, though, is the awareness that power, by its very nature, and as a reflection of inequality and asymmetry, is political in that normativity is necessarily involved. Ethically, one is therefore bound to ask what gives rise to these asymmetries. What follows is a discussion on how discursive practices, knowledge and social justice give rise to the asymmetries that profoundly impact on identity formation.

3.3.2.1 *Discursive practices*

If discursive practices are understood to be 'culturally accepted and reinforced ways of thinking, speaking, writing, and non-linguistic forms of representation' (Trueit and Doll Jr, 2010:135), then discursive practices *per se* are not neutral as a subjective boundary has to be drawn to separate what is culturally acceptable from what is not. Moreover, 'reinforced' is itself the result of a normative decision to exercise power towards a desired outcome. Trueit

¹ 'Microphysics of power' refers to power not being a property, but a strategy used in the relationships between people

and Doll Jr (ibid) say that discursive practices ‘produce and reproduce a culture’ and therefore can never be neutral. It is political and powerful ‘in that it advances certain frames of reference and denies or limits others’; it is used strategically as per Foucault’s microphysics of power. Discursive practices shape, perpetuate and reinforce what is desired by including and excluding.

Discursive practices are integral to identity formation as relationships come into being through linguistic and non-linguistic practices; therefore identity formation is necessarily constituted through inclusion and exclusion. This is not only relevant to formation of self-identity, but holds true for group identity. Group members use discursive practices to include and exclude in order to form groups with which to identify. In the case of institutions or groups, these discursive practices give rise to informal group identity which ‘produce and reproduce’ a culture, as quoted from Trueit and Doll Jr above. This reproduced informal group identity forms communities of practice and becomes institutionalised. Power relations are everywhere, or as Woermann (2010b:176) puts it, ‘power relations are continuously at play, both in communities of practice and between communities of practice’.

As language is integral to narratives and discourses, it follows that power is implicit in our narratives and discourses. It is used to include and exclude, usually as the individual strives to belong, and forms its emerging identity through the narratives. These narratives, as Woermann argues, (173), allow us to in- or exclude, to differentiate between ‘me’ and ‘you’. Reay quotes Hall (2003:52) as saying that identities function as points of identification and attachment only because of their capacity to exclude, to leave out, to render “outside” abjected’. How, where and who we choose to in- or exclude are normative decisions that enable or limit our ability to enter into the world of the other which Bloch and Nordstrom (2001:16) regard as prerequisite to acting ethically.

Not only do we shape and choose our relationships through discursive practices, we come to be through the narratives we tell of our experiences, as pointed out previously. Woermann (2010b:172) emphasises language in identity formation: ‘language is the medium through which we can form some stable idea of our own identities, as well as gauge the necessary identity distinctions for a given practice’ and further, ‘the iterative quality of identity is expressed through language, since we become conscious of ourselves and our practices through language’. With regard to identity formation being part of the narrative of the

system, De Villiers-Botha and Cilliers (2010:20) state that ‘describing or demarcating the self is always a matter of narrative’ because we select or recognise certain aspects of ourselves and others, while leaving out other aspects. We live our lives through the stories we tell of our experiences, just as we constitute our identities by including and excluding through boundaries, in situations not always of our own choosing.

Baskin (2007:1) says we live in a ‘mythic, story-constructed world that we co-create from moment to moment’. Such nested, mythical spaces can become alienating if they do not change with the environment. De Villiers-Botha and Cilliers, (2010:36) warn that if narratives are not adjusted according to changing conditions, we not only risk becoming unethical, we also risk becoming obsolete as we will be ‘out of touch with the realities, norms and values of those that surround us’ (ibid).

However, this presupposes not only a fluency and understanding of the language used as a medium for discursive practices, it also demands an ability to enter into the world of the other through the discursive practices of the other. This is especially so when the requirements of difference and diversity demand the engagement with the other in a non-mother tongue language. An example of this would be the consequences of teaching in English and even Afrikaans for learners in the education system, where their mother tongue is not English or Afrikaans.

The quality of our imagination and creativity depends on our willingness to engage with difference and diversity (see 3.2.2.7, 3.2.2.8 and 3.2.3). If we are too disabled, if our thinking is too homogenised, or if our language ability is too constrained, we will not be able or willing to risk engaging with difference. This impacts on identity formation because imagination and creativity are key factors in the emergence of identity and resilience, or as Arnot (2003:97-119) states, ‘creativity is a key factor in processes of identity constructions, identifications and alliances’.

In the previous chapter the significant detrimental impact of linguistic ability on educational outcomes, as well as the chances of the learner to escape from a poverty trap, was discussed. Not only do the disadvantaged have to contend with a limited linguistic ability in asymmetrical power relations, they also have to be aware of the effects of their language ability which also ‘manifests in the “domain of knowledge, reflection, thinking and writing”

(Grosz quoted in Woermann, 2010a:156). On top of that, they need an awareness of what Dasgupta in Morrow, (2007:191) terms ‘what has not been spoken’ (quoted in the previous chapter), in other words, discursive practices that are not overt and that reinforce asymmetries. Critical consciousness is essential to awareness, but critical consciousness itself is a deep understanding or awareness that arises through language – it is emergent, and requires enabling language in an enabling relationship. Woermann (2010b:181) says that a critical disposition is essential for moral imagination because ‘the skills needed for moral imagination, namely the ability to recognise and integrate opposing moral and contextual factors and perspectives, are also the hallmark of critical thought’.

Language ability therefore is an instrument, for want of a better word, towards raising consciousness, giving meaning and constituting identity.

3.3.2.2 Knowledge and knowledge creation

Identity formation is normative in the sense that the individual chooses what or who to include and exclude, as discussed in the previous section. This choice is based on a number of factors, such as language ability, creativity, and also on what the individual knows at that point in time and space. It determines how identity will be constituted and whether it will be transformative and enabling, or limiting and disabling. The choice enables a common understanding, yet by the very action of choosing and drawing a boundary, it excludes and therefore limits possible transformation. We have to be pragmatic and strategic in our interactions with the other (even if we do not always have total control over the process), but it is imperative that the power inherent in making such normative selections be borne in mind.

What we know and how we know are linked with how we conceptualise our world and ourselves in it, therefore identities are always epistemically salient. As such, identity is an epistemic resource, or, as Moya, (2009:51), puts it:

As fundamental social beings, we humans can no more escape the effects of our identities on our interpretive perspectives than we can escape the process of identification itself. Identities are fundamental to the process of all knowledge-production.

Our identity becomes an emerging lens through which we ‘read the world’ and co-create knowledge (Sánchez-Casal and Macdonald, 2009:20). Because our context changes continually in terms of time and space, identity is never final, and what we know is never final. Woermann (2010b:167) says that the question of identity formation must be addressed temporarily as well as spatially as context changes in terms of time and space. As such identity is embedded in the narratives of the past from which it emerges in relationships. Importantly, it is enabled and/or limited or disabled by the relationships in this world of experience.

Baskin (2007:5) says that discourses are the narratives that govern fields of practices, which in turn ‘reflect the episteme, the narrative about how people in any culture know’. In order for systems to be transformed, the current epistemes (that is, knowledge) are applied to create more knowledge, yet power is embedded in the very language and narratives of the epistemes, thus affecting transformation. Baskin’s assertion (ibid) that an ‘episteme enables people to develop a common understanding of the world by simplifying it’ is reminiscent of the notion in complexity thinking of using a filter to make sense of a complex system; or the identity of a system being its lens through which it ‘understands’ the world. Similar to Nilsson’s concept of a filter or the idea of zooming in and out (Nilsson, 2007:239; 244), boundaries in identity formation constrain, include and exclude.

What an individual knows and how it knows is tied up with how it conceptualises itself in the world. Moya (2009:47) distinguishes between subjective and ascriptive identities and says that the way people understand the relationship between subjective and ascriptive determines an essentialist, idealist or realist point of view. Ascriptive identity refers to imposed identity based on social categories, for example when stereotypical characteristics of subservience are ascribed to a rural black female in the South African context. Subjective identity is the individual’s emerging sense of self through lived experiences in relationships.

For essentialists, the relationship is one of absolute identity: a white female self-identifies and behaves in a certain way because she is of a certain group and gender. Idealists claim ‘no stable or discoverable relationship between the ascriptive and subjective aspects of identity’: relationships with others have no or little effect on the strong individual who wants to be successful (ibid). As such they underestimate the referential and social nature of identity.

Moya believes that individuals have much less power over their identities than idealists allow (48).

Realists see a dynamic relationship between ascriptive and subjective identity: people are neither wholly determined by their recognizable social categories, nor can they ever be free of those social categories. This impacts on transformation and Moya warns

Because the identity contingencies we are likely to face have potentially debilitating effects on our live-chances, we ignore the dynamics of identity at our peril. To the extent that we are interested in transforming our society into one that is more socially and economically just, we need to know how identities work in order to effectively work with them (48).

This resonates with De Villiers-Botha and Cilliers' complexity-based model of the self through which the self must be understood relationally in a system of differences (De Villiers and Cilliers, 2010:20), and underpins the importance of identity formation in a complex system, for example, education in South African public schools.

3.3.2.3 Identity and social justice

Social justice refers to justice within society and implies asymmetries and power; it implies haves and have nots. It is defined in terms of absence of what is regarded as good, and therefore exclusion from what is deemed beneficial. The previous chapter detailed the consequences of the inequities arising from social injustice on education in South Africa, and this section will ascertain to what extent social injustice gives rise to asymmetries that impact on identity formation. In this section, we will turn to the concepts of justice, social exclusion, poverty as a form of structural and symbolic violence, belonging and hope before discussing the consequences on identity.

Cribb and Gewirtz (2003:18), identify three concerns for justice or injustice: distributive, cultural and associational. They quote Fraser, who defines them in terms of *absence*. For example, distributive justice is concerned with the distribution of goods, including cultural and social resources, and is an absence of exploitation, the absence of economic

marginalisation and the absence of deprivation (ibid). Cultural justice is the absence of domination by a culture other than one's own, through discursive practices and interpretation. It is the absence of disregarding the other ('being rendered invisible' (ibid)), and the absence of disrespect (ibid), for example through stereotypical caricatures.

Cribb and Gewirtz, (19), include a third form of justice framework – associational justice – which they regard as an absence of:

patterns of association amongst individuals and amongst groups which prevent some people from participating fully in decisions which affect the conditions within which they live and act.

According to Cribb and Gewirtz (ibid) associational justice must be achieved before distributive and cultural justice can be achieved. In other words, individuals and groups must have freedom of association so that they can participate fully in decisions that impact on their life worlds. Until they are free to form associations, and form identity through these associations and relations, distributive and cultural justice cannot be achieved. The consequences of associational justice with its implications of social exclusion through boundaries, together with the conditions for identity formation, should not be underestimated, as will become clear.

Tett (2003:85) says social exclusion is an active process of exclusion from power and material assets. She quotes Madanipour and colleagues: 'Social exclusion is ... a multidimensional process in which various forms of exclusion are combined' ... 'When combined they create acute forms of exclusion that find a spatial manifestation in particular neighbourhoods'. An example of such a multidimensional approach is the laws that governed apartheid South Africa and the formal and informal practices that often became institutionalised. The effects to this day manifest themselves in the transport burden on the poor, culturally and racially homogenous suburban areas, the lack of diversity in township and advantaged schools, and institutionalised practices that lead to incidences such as the Reitz Residence racial incident² and initiation practices at schools³.

² www.sanews.gov.za/south-africa/charges-against-four-reitz-students-clarified

³ www.education.gov.za/LinkClick.aspx?fileticket...tabid=193&mid.

For Tett (ibid) this means that social exclusion

can only be understood as a relational term that is really about the social processes that reproduce inequalities of power and resources, reinforce low self-esteem, undermine status and lower expectations. Combating social exclusion and increasing social justice thus require re-distributive measures as well as enabling the needs and interests of marginalised communities to be articulated and acted on.

Social justice therefore cannot be achieved through redistribution and cultural recognition only. Whereas Cribb and Gewirz regard associational justice as a prerequisite for distributive and cultural justice, Tett believes the one does not precede the other. Whether it is a simultaneous process or whether associational justice precedes social justice is not pertinent in the context of this writing. I do believe, however, that association that leads to communities of practice has a profound impact on identity formation, as argued below.

Informal group/institutional identity must be distinguished from formal institutional identity. The latter refers to the implementation of policies and laws which were drafted as a result of previous knowledge. Meaning, and therefore identity, is constituted in part by the implementation of these already existing policies and laws. These policies and laws, however, have a profound effect as they lead to communities of practice which develop in particular conditions and contexts. As Epstein, Hewitt, Leonard, Mauthner and Watkins put it (2003:121): 'People may "make themselves" through the constant reiteration of particular performative acts (Butler 1990), but they do so (to misquote Marx 1963) in conditions not of their own choosing'. When the policies and laws are disconnected from the principles of justice and equality, or when the implementation of the laws and policies is not aligned to the policies and laws themselves, disabling and limiting conditions emerge. As a system cannot be separated from the other or from the environment, such disabling and limiting conditions must necessarily affect identity formation. An understanding of who we are not can be enabling, but it can also be disabling and limiting if our sense of our 'place' leads us to exclude ourselves from relationships which could have been enabling. Our need to belong and to fit in could stultify identity formation if it leads to an avoidance of the other.

At this point the effect of poverty on association should be noted. Swartz, Harding and De Lannoy (2012:29) say poverty is a form of structural⁴ and symbolic⁵ violence which excludes and includes people from belonging and from citizenship. On the one hand, citizenship refers to the constitutional rights and responsibilities ‘defined and guaranteed by membership in the state and submission to its power’. On the other hand citizenship highlights the ‘constant struggle of marginalised persons to expose the violence inherent in their exclusion and the social origin of the state’, in other words, against social injustice. South African township youth are members of the South African state, but they are excluded from the benefits and rights which they are meant to have as they depend on others for social access and subsistence. It is this need to belong that has led to what Swartz *et al* (27) term ‘ikasi style’, which leads to ikasi-identity.

Ikasi style refers to the ways in which behaviour that would not normally be socially acceptable, is rationalised. A brief discussion of this concept is necessary as it is relevant to teaching and learning in South Africa. The authors reference Barbalet (2007) who explains that apartheid policies were designed to exclude 80% of South Africans from ‘any sense of citizenship or belonging – national, political, social, sexual, cultural and emotional’. Despite the democratic dispensation and one of the most inclusive constitutions, ‘inequality and the spatialisation of poverty persist’, (Wilson, in Swartz *et al*, 27). The continued inequality mitigates against a sense of belonging to democratic South Africa and the actualisation of citizenship for the majority of South Africans. Exclusion from social and economic systems denies the individual a role in the becoming of the self and of the collective.

Swartz *et al* (28) found that black township youth gain access and agency in their immediate social environment and the larger collective by aspiring to upward mobility, which they achieve through *ikasi style*. This style includes violence, sex, substance abuse, music and fashion which become markers of belonging. Swartz *et al* (ibid) state that, ‘Youth explain that it is this style that forms the setting of township life, the foundation of township identities, and serves as a “moral ecology” (Swartz 2010) adapted to the realities of poverty’.

⁴ Structural violence, according to Farmer (in Swartz *et al*, 2012:30) is the ‘institutionalisation of social processes that differentially cause suffering through organising unequal access to social resources, such as rights, security, capital and bodily and mental integrity, based on markers of difference’.

⁵ Symbolic violence: This is violence embedded in everyday life, through misrecognition, through complicity and by consent (Morgan and Bjorkert, 2006:441). It is not physical violence.

They also found that this behaviour perpetuates the denial of dreams. In these circumstances hope cannot be actualised.

Swartz *et al* (27) state that symbolic violence, together with what Swartz calls the moral ecology of the townships, shows that the social, political and economic structures of Apartheid, and the internalisation of inequalities, perpetuate poverty. An example of the latter would be the findings of the Create report by Motala and Dieltiens (2010), that the majority of South African citizens are satisfied with public school education despite the evidence that they should and could have higher expectations. Instead of being conscious of social injustice, an attitude of meritocracy is adopted and blame is individualised: 'Experiences are individualised in a process in which setbacks and crises are viewed as personal failure even when they are connected to processes beyond the individual's control (Reay, 2003:59).

Hope is deferred, with two consequences (Zegeye and Maxted, 2002, in Swartz *et al*, 2012:34): firstly, the avolition of the youth, being without will, or unable, to do what is required, for example, in order to access a university education. Secondly, deferred hope leads to antisocial behaviour, which can grow into rage. This deferment of dreams 'impedes self-actualisation and the development of identity' (ibid).

Instead of being conscious of the fact that structural injustices mitigate against their chances to escape poverty, attend university or find sustainable employment, the youth remain optimistic and hopeful (although a better term is *full of wishful thinking*⁶). Swartz *et al* (32) warn, 'This double-edged sword, of high aspiration coupled with slim chances of success, is what we term "the quiet violence of dreams" – a phenomenon that asks whether dreaming is itself a "weapon of the weak" ... 'or a weapon *against* the weak'. The question is whether the imagination of the township youth to self-organise (*ikasi style*), to imagine a better future (*ikasi style*), and to be creatively resilient (*ikasi style*), is an enabling weapon against their exclusion from the desired society 'out there', or a disabling weapon against themselves in their fight against poverty and limiting conditions. The answer appears to be the latter.

⁶ 'wishful thinking' (as the reality of hope and optimism) is a phrase used by Tabensky, Director of the Centre for Leadership Ethics, Rhodes University.

How society perceives social exclusion leads to different solutions, but Tett (2003:85) urges that people living in social exclusion have agency and should not be regarded as the problem, but rather as the solution. This holds true for those in the complexities of township education in South Africa. The question is whether social exclusion prevents enabling identity formation, and the answer must be affirmative, as identity is relational and emerges from the generative capacity of difference. Being excluded denies, amongst others, access to diversity. On the other hand, Reay (2003:59) warns that reflecting on the difference could lead to dis-identification from one's current social position, if it leads to symbolic violence. She claims that this symbolic violence against one's 'own' is, paradoxically, pivotal to a person thinking herself into other, more privileged, spaces. Without an awareness of the more desirable other, one cannot imagine oneself out of one's current context. She calls to mind Bourdieu's 'duality of the self' which is

evident in these working-class experiences of upward mobility, generating "a habitus divided against itself, in constant negotiation with itself and with its ambivalences and therefore doomed to a kind of duplication, to a double perception of the self, to successive allegiances and multiple identities" (Bourdieu, in Reay, 2003:59-60).

Yet this symbolic violence, which could have negative or positive consequences, against the self and sameness is characterised by hope and creative responses to challenges. It is a time of moral imagination and critical thought, if the balance between Morin's principles of unity and diversity are effected. If the balance is not continually interrogated critically, symbolic violence could result in alienation, where alienation is understood to mean the removal of oneself from the troubling consequences of one's work or environment (Bloch and Nordstrom, 2007:17).

Whereas identity emerges from wilful drawing of boundaries through exclusion and inclusion, albeit in conditions not necessarily of one's own choosing, social (in)justice creates the conditions that are not necessarily of one's own choosing, and not necessarily what one would have desired in ideal circumstances of equal playing fields. It creates uneven playing fields with such seemingly insurmountable asymmetries that a disadvantaged individual may not even consider entering into the world of the other. Moreover, as one's identity is the lens through which one conceptualises the world and creates knowledge, an identity limited by the effects of social injustice may render the person so disabled that she cannot conceptualise the

other as relationally possible. The need to belong and to fit in is paramount, leading to increased social inclusion in what society deems undesirable, e.g. *ikasi style* communities of practice, and leading to increased social exclusion from what could be possibilities of hope actualised.

Pertinent to identity formation is that social justice or injustice gives rise to asymmetries that impact on identity formation, and that identity formation itself, through inclusion and exclusion, reinforces the asymmetries. This is a double edged sword in which the disadvantaged and marginalised have little chance of winning by means of entering into the world of the other.

Moya (2009:48) asserts that to have a more socially and economically just society, we need to know how identity works. The link between social justice and identities is echoed by Cribb and Gewirtz (2003:21) who say that social justice requires recognising diverse identities and ‘modes of association that include rather than marginalise’. They bring social justice to the level of everyday personal relations. Similarly, Gamarnikow and Green (2003:211) say that social justice is about recognition and authenticity of identity and equity in participation, but the question remains how one would create such enabling conditions that enables the disadvantaged individual to become critically conscious and creative despite overwhelming disabling conditions such as linguistic ability, a limited life world, poverty, and deliberate or unintentional structural and symbolic violence.

3.4 CONCLUSION

This chapter emphasised the necessity of making sense of an increasingly complex world by viewing it through a lens of complexity thinking. As social beings we are not only constituted by the ethical choices we make, we also impact on how the other constitutes themselves. In the process we cannot avoid the power of excluding and including and being at the receiving end of such exclusions and inclusions, nor can we avoid being responsible for the known and unknown consequences of our actions. What we can and should avoid is limiting ourselves and others. We should heed the advice of De Villiers-Botha and Cilliers (2010:36):

as we construct our narratives that give meaning and identity to ourselves and to others, it falls to us to continuously reassess our perception of ourselves and of others and to always remind ourselves that we are only ever dealing with a small part of the whole picture, and as the picture changes, so should we. This is not only a normative (ethical) point, but also a pragmatic one.

Complexity thinking is pragmatic in that it admits to only dealing with part of the whole. It is ethical in that it is a constant reminder of the ethics required when boundaries are drawn to demarcate the ‘small part of the whole picture’ (ibid), or to include the other in relationships that constitute our identities. It is a constant reminder of the generative capacity of difference, but it leaves us humbled in the face of the transience of the knowledge we gain momentarily.

Our identities emerge in a social environment that changes continuously, and therefore De Villiers-Botha and Cilliers (37) remind us that ‘a poorer, or less complex, understanding of the complexity of that environment and the individuals in it will severely limit our ability to successfully act and interact in that environment’. An emerging identity in enabling conditions should facilitate an emerging critical consciousness where this critical consciousness is understood to be an awareness of our situatedness in the world and in relation to the other. Framed in complexity thinking, an emerging critical consciousness must fill one with humility and a willingness to take responsibility for the unknowable future.

This is nowhere more crucial than in underperforming public schools in South Africa, characterised by asymmetries caused by the power inherent in social injustice, poverty, discursive practices and limiting and limited identities, as well as a lack of diversity. From the discussions above it can be accepted that quality teaching and learning is not merely about what happens in the classroom; it should be about identities and meaning being co-created in authentic, enabling relationships; it should be about consciousness and knowledge emerging. We should therefore be questioning teaching and learning practices, and the ethics thereof, but we should also find ways to create enabling conditions in the education system. This will be addressed in the following chapter.

Chapter 4: Application

4.1 INTRODUCTION

4.1.1 Context

In chapter 2 the state of South African school education was assessed in terms of the ‘Four As’ of the International Committee for Economic, Social and Cultural Rights (Woolman and Bishop, 2012:57-19 to 57-32). The ‘Four As’ are *Availability / Adequacy*, *Accessibility*, *Acceptability* and *Adaptability*. It was concluded that South African public school education in general does not measure up to this international standard.

An ethical approach to education, framed in complexity thinking, was proposed. This, together with enabling and enabled identity formation, could create localised interactions through which transformation could be facilitated. Complexity thinking, identity formation, and their ethical and political implications were addressed in chapter 3.

The final chapter is an application of complexity thinking and identity formation on what appears to be the future trend of education in South Africa, the National Development Plan (2011). The NDP is currently the policy document for improving, amongst others, education, training and innovation (the title of chapter 9 of the NDP) by 2030. While it does not deal with the minutiae of the planned interventions, it does give quantifiable targets and therefore it is reasonable to assume that it gives broad direction within a framework of, for example, social justice or economic growth.

4.1.2 Chapter structure

The chapter is introduced by a reflection on the purpose of teaching and learning, in terms of complexity thinking and identity formation, followed by the purpose of teaching and learning according to the NDP.

The next section assesses the proposals of the NDP to improve basic education in South Africa. This will be done in terms of the 'Four As' which were used in chapter 2 to ascertain whether South African public school education meets the criteria of the International Committee for Economic, Social and Cultural Rights (Woolman and Bishop, 2012:57-19 to 57-32).

This is followed by concluding remarks on the imperatives of viewing teaching and learning through a lens of complexity thinking, with identity formation as the key to unlocking the numerous possibilities of complex systems such as education.

4.2 THE PURPOSE OF TEACHING AND LEARNING

4.2.1 Teaching and learning in terms of complexity thinking and identity formation

Learning forms and re-forms, in a process of self-organisation, as it adapts to the demands of the context in which it takes place. It is therefore a complex process, according to Nicolaidis and Yorks (2007:224), who say on page 226 that learning is a

complex phenomenon that requires diverse, continually interconnecting dynamics, in mutually determined relationships. By mutually determined relationships we mean those interactions that reflect the authenticity of the relationships that co-construct beneficial action.

Teaching and learning are relational and inextricably part of identity. It is a complex process and requires mutually beneficial and enabling relationships, as well as trust. Josselson (1996), quoted by Nicolaidis and Yorks (2007:224-228), says that:

Mutuality takes place along the boundaries among the self, other and we. Mutuality implies trust, confidence that a self entrusted to a we... will be cherished and respected, not violated or discarded capriciously... Authenticity does not flourish in a climate of manipulation and exploitation.

For Josselson learning has to have dynamic relationships and abundant information, if the system is to cope with the complexity of the present. This relationship is not only between the learner and teacher, or learner and environment, but also between the learner and the process of learning, as well as between the learner and the content to be learned.

Teaching and learning, with its restricted curricula and practices as discussed in Chapter 2, direct the learning and teaching that take place by means of various resources (e.g. financial and human resources) towards a desired outcome (the successful completion of the curricula) which is usually determined by the dominant culture. As Osberg (2005:81) puts it, 'it purposely shapes the subjectivity of those being educated' and socialises people into a way of life that is desirable to the dominant culture, through planned enculturation (81-82). Those with, or in, power predetermine the desired product or subject that should exit the school system, and direct resources towards achieving their goals. This predetermined, desired goal is a value judgement, usually based on evidence of what is required by the economy.

Such purposeful shaping must recognise the complexity of teaching and learning. It therefore should not rely only on determinism and linear progression. It must allow for emergence, a defining characteristic of a complex system. If the purpose of teaching and learning were to be seen through the lens of complexity, the stakeholders would understand that what they know about the teachers, the learners or the purpose, is emergent; the knowledge is transient. Osberg (82) says subjectivity ought to be shaped from a 'position of extreme flexibility and responsiveness to the moment or space we are in'. Biesta (quoted by Gough, 2010:48) argues that

education should aspire not only to qualification (the transmission of knowledge and skills) and socialisation (the insertion of individuals into existing social, cultural and political orders), but should also be concerned for the "coming into presence" of unique individuals.

This means the becoming into consciousness of the teacher and learner in a space of radical contingency where curricula are not only the materials, ideas or topics, but are rather 'a broad range of educational experiences that contribute to the ways learners might interpret their own and others' identities (Davis, Sumara and Iftody, 2010:107).

Teaching and learning as qualification, socialisation and becoming into consciousness does not avoid determinism, power and value judgements by the dominant culture. However, the lens of complexity, and with it, the ethics of complexity, in itself raises consciousness of the ethics of overt and covert educational practices.

In the practices of teaching and learning, value judgements from positions of power are made when we decide on the outcomes that we want to achieve, and on the means towards those outcomes. Biesta (2010b:501) stresses this point when he says

values are not simply an element of educational practices, but are actually *constitutive* of such practices. We might even say that without normative orientations, without decisions about what is educationally desirable, without an articulation of the *telos* of *educational* practices, these practices simply do not exist – or at least they do not exist as educational practices.

We cannot ignore the subjective normativity implicit in educational practices, and when we choose those educational practices, we should not ignore the provisional imperative towards ethical and just choices, as seen in chapter 3.

4.2.2 Teaching and learning, in terms of the NDP

The NDP recognises education, training and innovation as core to eliminating poverty and to changing South Africa into a just society in which lifelong learning and work experience will improve productivity and enable ‘a virtuous cycle that grows the economy’ (NDP, 2011:261). The report first states that a good education system requires foundational skills in areas such as ‘mathematics, science, language, the arts and ethics’ (ibid), but later on (264) both the arts and ethics are omitted as essential areas. While the NDP calls for a flexible education system, responsive to the needs of children, families and communities, it is not clear how these needs are determined, nor is it clear whether those needs can be responded to at interface level, by the stakeholders in the emerging situation.

The vision of the NDP articulates the need for social cohesion, consensus, service and values (2011:53-59). The NDP, however, does not leave any doubt that its goal is the development

of human capital for and by a growth economy. This is possible through the development of national and individual capabilities, creation of opportunities and the participation of all citizens (5). Four proposals have a direct bearing on basic education and cover early childhood development, the management of the education system, school principals and teacher performance (18). Early childhood development spans pregnancy planning to preschool years (five year olds). Management of the education system includes knowledgeable district officials and the administration of education (266). The latter includes appointment and disciplining of teachers. According to the proposal, by 2030 principals should be effective managers providing administrative and curriculum leadership (ibid) and teachers should be professional and committed, with good knowledge of the subjects they teach (ibid).

The complexity of basic education is reduced to four focus areas, in order to achieve quantifiable targets to produce human capital for the economy. While reductionism of a complex system is inevitable (as seen in chapter 3), the NDP exhibits a restricted understanding of the complexity of the reasons for the underperformance of public school education.

In chapter 3, 3.2.2.8, it was asserted that boundaries are drawn from subjective observations and are contingent upon available resources, such as knowledge, human resources and financial resources (Woermann, 2010a:122). Although there is value to the proposals given by the NDP, more information on how they arrived at the proposals would have been apt. It does, however, state that values learnt at school ‘permeate society’ (NDP, 2011:262), and therefore it is accepted that the values of society played a role in this policy document.

4.3 COMPLEXITY THINKING, IDENTITY FORMATION &THE NDP, IN TERMS OF THE ‘FOUR AS’

4.3.1 Availability / Adequacy

In chapter 2 Availability / Adequacy was discussed in terms of funding, teacher training and performance, as well as the physical and mental absenteeism of teachers in the class room. The conclusion was that the state does not make available adequate school facilities and class

rooms, it does not make available the instrumentalities of learning to every learner, and it does not provide funding for adequate staff resources. In addition, the physical and mental absenteeism of teachers affects identity formation, as a broader understanding of availability / adequacy includes identity formation in relation to others, as will be argued below. The inequities of the past are being perpetuated by a system that cannot be regarded as fair to learners.

The NDP seeks to redress past inequities and eradicate poverty, yet it does not address school funding at all, except to state that infrastructure backlogs (such as water, sanitation, libraries and laboratories at schools) ‘need to be addressed so that all schools meet the basic infrastructure and equipment standards set by the national Department of Basic Education’ (266). Draft norms and standards were published in September 2013 by the Minister of Basic Education, after months of postponements. Once accepted as policy, the norms and standards have to be implemented by 2030 (which is also the date by which NDP goals have to be met).

As seen in chapter 2, 2.4.1, the allocation, or provisioning, of teaching and support posts in schools adds to the inequalities experienced by the teacher and learner in disadvantaged schools. The NDP does not address post provisioning directly and gives no indication that the post provisioning model will be revised in order to implement a fair and equitable distribution of posts, providing in the curricular needs of all schools. However, the NDP does call for ‘adequate and appropriate capacity’ ‘to support schools that are performing poorly’ (ibid). Such support appears to be situated mainly in district offices and not as permanent staff members in under-resourced schools. Where the NDP does mention library/classroom assistants, the provision of such assistants are dependent on underperforming teachers attending training during vacations. Teachers in need of training will be selected on the basis of assessment scores of the learners they teach (281). Training will be focused on improving subject knowledge.

Underperforming, however, does not necessarily only stem from inadequate subject knowledge, as seen in chapter 2 and 3. Essential support staff becomes a ‘tool’ to deal with underperforming teachers, yet schools urgently need the support staff. This indicates that the NDP does not grasp the complex reasons behind underperformance, nor does it grasp the situation at grassroots level. Instead of dealing with underperforming teachers individually,

the NDP withholds essential support from learners and teachers, with consequences that cannot be predicted.

The NDP recognises that teachers are central to improving teaching and learning in South Africa, therefore teachers must have ‘a good knowledge of the subjects they teach’, especially in Maths and Science (265). Teachers’ efforts and professionalism must be recognised and remuneration must be performance-based, bearing in mind various mitigating factors such as the school environment (ibid). Unfortunately the NDP falls short in recognising that worker satisfaction is not primarily a matter of remuneration and better resources. The so-called Hawthorne effect (Shaw, 2008:262) states that to have less disengagement and alienation from one’s work and have more engaged and better productivity, institutions must meet the needs of employees that money cannot buy. Dissatisfaction often arises from extrinsic factors, such as remuneration, but having more effective workers depends on factors such as ‘a sense of accomplishment, responsibility, recognition, self-development and self-expression’ (263). Workers, in this case teachers, do not feel valued when they are regarded as spokes in an organisational wheel. They want to receive attention and recognition. Martin, dean of the Rotman School of Management at the University of Toronto, (cited by Shaw, 263) found that happiest employees are those who are members of a team they respect, and when the team and institutions are respected by outsiders.

The NDP refers to ‘non-economic’ ways of rewarding good performance, such as public awards, exchange programmes and sabbaticals (NDP, 2011:284), but this is one phrase amongst a sea of monetary and subject competency talk. In addition, while teacher training is important, the NDP does not recognise that teacher training is not the panacea that will ensure quality teaching and learning, as discussed in chapter 2, 2.4.1.2 (a). Teacher training is only one factor that influences good educational choices that enable identity formation in order to give hope to teachers and learners. A complex system is constituted by its ethics, as was seen in chapter 3. It requires morally competent, engaged subjects that are critically conscious and fully aware of the consequences of their actions. Without personal engagement in the classroom, and in the offices, it is not clear how the NDP’s plans will result in success in 2030, which is premised, inter alia, on ‘active efforts and participation of all South Africans in their own development’ (2).

Morin (1999:25) states that ‘all truly human development means joint development of individual autonomies, community participations, and a sense of belonging to the human species’. All three components are necessary as human complexity ‘cannot be understood in dissociation from the elements that constitute it’ (ibid). The NDP appears to dissociate the elements of human complexity: firstly, it separates subject specific teacher training from other individual autonomies, e.g. training in ethics, raising awareness and identity formation. Secondly, the NDP calls for active participation without suggesting how this will be achieved. Lastly, it does not address a person’s need to belong.

Morin’s ‘sense of belonging’ is echoed by Buber who says that the longing for relation is primary, as was seen in chapter 2, 2.4.3, (Buber cited by Bloch and Nordstrom, 2007:16-17). When one’s sense of self and belonging to one’s profession is compromised through past and present injustices, amongst others, one tends to withdraw into safe spaces where one does have a sense of belonging. An example of a safe space could be a group, such as a teachers’ union. Union membership, *per se*, is not problematic; it is only so when the union is closed off to a complex world. As members of closed organisations, teachers’ ability to be effective in a complex society is compromised, as is their identity formation through relationships with the ‘other’, because identity is constituted relationally, and is complex and changing. Because of the closed nature of unions and the lack of diversity in schools, the majority of South African public school teachers have been alienated from their profession and as a result have lost their sense of belonging to an institution or profession. The unity/diversity principle discussed in chapter 3, 3.3.1 is not balanced because the group identity as a union member has ‘become more salient’ (Paulsen in Woermann, 2010b:173). The ability of union members to empathise with the plight of the learners in their classrooms has been compromised in favour of their rights as teachers. Union members’ ‘moral ecology’ (Swartz, 2010) is teacher-rights-based and being a member of the union gives them a sense of belonging. They have become mentally and physically absent in the classrooms, as seen in chapter 2, and therefore give little or no hope that comes from personal engagement with their learners.

The lager mentality of South African groups, e.g. union members, but also the ‘ikasi-style’ members of the youth, (see chapter 3, 3.3.2, Swartz *et al*, 2012:27), must be opened as group identity in closed systems limits the ability of an individual to ‘co-construct beneficial action’ (Nicolaidis and Yorks, 2007:224) in a diverse, continually interconnecting environment

between self and the other. The question is how the layers can be opened, and the answer, I believe, lies in identity formation through local interactions and complex conversations.

Siu (2008:162), in a study done in Hong Kong, says although statistical analyses reveal top-down communication as the most prevalent, a 'personal approach of caring and understanding may facilitate better communication and interaction among colleagues in reform implementation' and it will facilitate successful self-organisation to cope with the uncertainties of reform implementation (ibid). Only then will identity formation be enabled and consciousness regarding the complexities of teaching and learning be raised.

Trueit and Pratt (in Trueit and Doll Jr, 2010:145) present the notion of 'complex conversations' as a new relational discursive practice to encourage interaction between teacher and learner in the classroom. This is based on the idea that classroom interactions can effect political change (ibid). Such complex conversations should take place between teacher and learner, between colleagues, between officials and learners, in fact, it should take place between all stakeholders in education as from these localised interactions exponential transformation could emerge. Complex conversations should also take place with the self, as critical self-reflection, according to Keesing-Styles, Dean of Teaching and Learning at Unitec Institute of Technology in New Zealand) (2010). A complex conversation means speaking and listening, debating topics based on the curriculum, on societal matters; it requires diversity and increases awareness. It opens up the transience of what we know and the possibilities of becoming through relationships. Complex conversations are dynamical and self-organising and, I believe, bring participants into the present, into a relationship in which consciousness and trust are constituted. It makes participants available to one another, in the moment, and enables identity formation in which teaching and learning can be effective.

The NDP does not mention the importance of localised interactions, other than to say that they will respect teachers' professional expertise and seek their opinion on educational matters (NDP, 2011:281). They also mention support or gathering evidence from institutions. These, however, are not necessarily meaningful intra- or inter-relational localised interactions that include complex conversations, as support is often experienced as prescriptive, and information-gathering is experienced as another requirement by the bureaucracy. No amount of teacher training, or testing for teacher subject competency, or

investigations looking for cause/effect relationships in education, or remuneration, will create the enabling personalised conditions required in education today.

For education to be available / adequate in terms of the requirements of the International Committee for Economic, Social and Cultural rights, it needs effective teaching through quality of staff and ratios, it needs adequate facilities and instrumentalities of learning, as we saw in chapter 1. This is not merely a numbers game: quantify requirements, then allocate funding, and the problems of education will be solved. Education certainly needs adequate and available funding; but, importantly, it needs people that are adequate and available to one another, in every sense of the word, especially if the ambitious quantifiable targets set out in the NDP are to be met (NDP, 2011:276-277). If people are adequate and available, they will, through and because of enabling identity formation, ensure that teaching and learning is also accessible, which brings us to the second of the 'Four As'.

4.3.2 Accessibility

In Chapter 2 Accessibility was discussed in terms of financial and physical accessing of schooling, as well as epistemological access.

4.3.2.1 *Financial access*

Financial access of schooling is not covered in the NDP, other than in terms of non-fee paying schools, and as an indirect result of what it regards as the core outcome of education, that is, economic growth and eradication of poverty. Economic growth would enable communities to afford the incidental and crippling expenses of education, such as transport and uniforms. Free schooling, as seen in chapter 2, does not guarantee accessibility and, according to Arnot and Swartz, can confirm a status of being marginal (2012:6), that is, a sense of not belonging, of being an outsider. There is no alternative, though, as inequalities between learners in a school, or learners from different schools, are inevitable. What is important, is the awareness that inequalities could lead to a sense of being marginalised. An example of awareness leading to better practice, is the National Scholar Nutrition Programme. When first introduced only the most vulnerable and destitute learners in disadvantaged schools received a daily meal, resulting in victimisation and marginalisation.

As seen in chapter 1, currently the programme provides meals to 9 233 133 learners in 21 467 quintile 1–3 primary and secondary schools as well as identified special schools nationally. This is against the annual target of 8 892 088 million learners as per the Annual Performance Plan (APP), an increase of 341 045 learners. The annual budget was R4.906 billion (Department of Basic Education 2012/2013 Annual Report).

Epistemological access is mainly addressed in the NDP through reference to high speed broadband, to every learner having learning materials, and to the importance of African languages or ‘mother tongue’ as being ‘integral to education, to science and technology, [and] to the development and preservation of these languages’ (265). No mention is made of how these interventions towards epistemological access will be funded.

4.3.2.2 *Epistemological access: technology*

In terms of access to technology in teaching and learning, the NDP recognises that technological access is critical to quality education and says that, by 2030, high speed broadband must be available to support learning in schools (2011:266). This would require infrastructure and support services, as well as an understanding of the epistemological disparities created by access to information technology. The implications of an assessment task requiring internet access must not be underestimated: it could be financially or technologically impossible and leaves the teacher and learner disadvantaged and feeling inadequate, thus compromising identity formation. A case in point is the compulsory Gr 12 Tourism practical assessment task of 2013 which accounts for 25% of the year mark. The assessment task requires internet access and advanced search capabilities to search sites for overseas flight comparisons, luxury rail travel and cruise liners, as well as tourism destinations in South Africa and in its neighbouring countries. It could be argued that a school offers Tourism by choice, but the reality is that Department of Basic Education aggressively promoted the subject over the past few years as a gateway subject to employment in the tourism industry. This was done despite the awareness of the department that the majority of South African public schools have no libraries or internet connections as was seen in chapter 2¹.

¹ Learners are further disadvantaged by Tourism not being a designated subject for admission to tertiary studies towards degrees or diplomas. This information is significant for the future education of learners, yet few schools are aware of this information as per the Government Gazette, 11 July 2008.

On the other side of the spectrum, are what Davis, Sumara and Iftody (2010:116) call, ‘whole new categories of injustice’ as a result of access to technologies and identities being mediated in cyberspace. It requires complex conversations towards a consciousness of a complex ethics and identity formation. They ask the question, ‘What sort of ethics might guide our relationships with others in spaces that are not always face-to-face?’ (107). The localised interface now has added dimensions of anonymity, fantasy and facelessness. Important as it is, it will not be discussed in any further detail as it does not fall within the primary scope of this study.

4.3.2.3 *Epistemological access: language*

As languages to serve the economy, African languages are not regarded by the NDP as suitable in a competitive economy. The NDP states that, ‘Language policy needs to be informed by a greater appreciation of labour market imperatives’ and it goes on to make explicit that English is the language for the economy, ‘Learners need to receive high-quality instruction in both their mother tongue and English from early in the foundation phase’ (266). Wright’s comments (2012:121) supports the contention of the NDP that English is the favoured language because of the ‘forces of natural language planning², driven by existing social motivation and established economic propensities, [which] have proven overwhelmingly more powerful’ than the call for mother tongue education, especially in African languages. This includes Afrikaans which has seen a ‘greatly reduced currency’ in business and public life (122).

But where does this leave the teacher and the learner who are not proficient in English, yet have to use English as the language of teaching and learning? Language ability is an instrument, for want of a better word, for bringing people into consciousness, for accessing and giving meaning, and for forming identity, as discussed in chapter 3, 3.3.2.1. Richardson *et al* (2007:64) equates language (used synonymously with discursive practices) with clothing we put on our insights. He warns that ‘few of us are trustworthy, good tailors’, in other words, how we clothe may not be a true reflection of reality or hyperreality. The

² Natural language planning supports emerging trends in society, other than linguistic factors. Trends could emerge as a response to sociological, economic or cultural changes. This is opposed to interventionist language planning that promotes minority languages or language shifts counter to dominant social pressures (Wright, 2012:121).

limited or untrustworthy insights could have various causes, ranging from limited language ability, to limited or constrained identity formation, or limited critical consciousness. It could also be caused by a deliberate attempt to distort or influence or enculture. Furthermore, it could be the result of cultural barriers where higher cognitive skills such as critical thinking, arguments and questioning can be deemed ‘disrespectful, argumentative and difficult’ in conversations between adults and children (Matentjie, quoted in Godsell, 2010:5). Such insights put an individual at a disadvantage as the relationship from which identity must emerge, is linguistically asymmetrical and violent from the outset. This impact is not only restricted to the language classroom, but affects all curricular and co-curricular activities, as seen in chapter 2, 3.3.2.1

It is also important to bear in mind that we have to reduce and model a complex system such as teaching and learning, in order to cope with its uncertainty and complexity. To do so, we use language (Trueit and Doll, 2010:135). A compromised language ability, or a perception that one’s language ability affects one’s ability to limit the complexity, merely increases the complexity of teaching and learning.

4.3.2.4 *Assessment of the NDP in terms of Accessibility*

Accessibility as second A, refers to learners being able to use the curriculum and resources, it refers to non-discrimination in terms of access, as well as financial and physical accessibility. While it is recognised that corruption and mismanagement are detrimental to funding reaching the learner, it is not acceptable that the per learner allocation, in some provinces, is still below R1000.00 per learner, when the 2007 departmentally determined cost package was R600.00 to R1000.00 per learner, as per the 2008 OECD report (see chapter 2). Neither is it justifiable that education expenditure has declined in real terms, as a share of total government expenditure and Gross Domestic Product, as seen in chapter 2. The NDP recognises the importance of technological access, but is silent on the funding and support thereof. The NDP, as a policy document, could have been more prescriptive in this regard, in order to redress the inequities.

The NDP calls for high-quality language education, but its conception of the complexity of language education, as well as of language in education, is not sufficiently multidimensional.

Access to education may be improved by having access to textbooks and broadband (and more teachers to fulfil the increased language teaching demand), but without ethical discursive practices to ensure epistemological access by both teachers and learners, little or no teaching and learning will emerge (see chapter 2, 3.1.2 (a) on the limitations that a teacher-centred approach place on teaching and learning, especially for language in education and language education). This has profound implications for teaching and learning as the limits of the language ability of the system are indeed the limits of the world of the system, to paraphrase Wittgenstein (McGuinness, 2002:8). Wright (2012:121) concludes that the dream of a multilingual South Africa lies in the hands of language education in schools, and in good quality language education at that. The NDP echoes the necessity of multilingualism, but it is not clear how this will be achieved.

4.3.3 Acceptability

Acceptability, the third A, refers to an education directed to the full development of human personality and to the strengthening of respect for human rights and fundamental freedoms. It requires a consciousness of what was, what is, what should be and what is possible.

4.3.3.1 *Identity as co-determinism*

For teaching and learning to be acceptable through a lens of complexity thinking, Gilmour, Christie and Soudien (2012) call for an ethics of engagement in education and say this will require ‘building dispositions of enquiry, cultivating awareness and concern for a common good and facing the suffering of others with a willingness to care’. According to them teaching and learning is about ‘enabling people to make sense of the world they share with others so that they are able to imagine alternatives and change the world for the better’. We have to be able to imagine and see the other in relation to ourselves. Davis *et al* (2010:110) say this consciousness is ‘an elaborate process that arises as the conscious self and the “other” interweave and enfold one another in a complex – that is, co-determining and self-transcending – choreography’. Consciousness emerges in relation with the other because of our ability to empathise, to put ourselves in the shoes of the other and imagine how that person perceives us (117). The responsibility for one’s own emerging consciousness (in real or imagined relationships such as through the social media), as well as the consciousness of

the other, is fundamental to teaching and learning. Through teaching and learning we should become aware of new possibilities; it should help us imagine better alternatives for the common good.

4.3.3.2 *Biesta's three interlocking principles*

In chapter 2, it was concluded that South African teaching and learning is not acceptable; it violates the fundamental rights of the child. It will require an ethics of engagement by teachers and learners to accept responsibility for self and the other, to take action for one another. To achieve this, Biesta (Edwards, 2010:75) says a language for education should be revitalised towards action, because of three 'interlocking principles: "trust without ground, transcendental violence and responsibility without knowledge"'. These concepts require explication as they are integral to building trust and creating spaces for complex conversations (see 4.3.1 in this chapter).

Biesta (2005:61) states that it is important to ask where and when education begins. He says it begins with the learner wanting to learn something, and the risk is that he may or may not learn, or the risk is that he may or may not like what he learns. Without taking a risk, education does not begin.

To engage in learning always entails the risk that learning may have an impact on you, that learning may change you. This means, however, that education only begins when the learner is willing to take a risk (ibid).

It is therefore important to create unexpected spaces and situations in which learners are exposed to risk. This actioned learning will assist in *trust* emerging as the learner learns that it is a safe space in which to take risks.

Transcendental violence, the second principle, is violence in that it asks difficult questions and creates difficult situations. It is transcendental in that it 'denotes conditions of possibility, i.e. denotes what needs to occur if coming into presence is a possibility,' (Biesta, 2005:63). It implies that learners should be confronted by otherness and difference (this is a reminder of the generative capacity of difference discussed in chapter 3, 3.2.2.7). Learners should be

interrupted by ‘transcendental violence as it creates difficult situations, but it is only through these that coming into presence is possible’ (Biesta in Edwards, 2010:75). Biesta explains (2005:62-63),

coming into presence is about being challenged by otherness and difference. Teachers and educators have a crucial role to play in this, not only by confronting learners with what and who is other and different – and this raises crucial questions about curriculum and the social organisation of schools – but also by challenging students to respond by asking such fundamental questions as ‘What do you think about it?’, ‘Where do you stand?’, ‘How will you respond?’

The last principle, *responsibility without knowledge*, refers to teachers being responsible ‘both for the emergence of the world (the future) and for the emergence of human subjectivity’, (Osberg and Biesta, 2007:47). The teacher is responsible for the subjectivity of the learner, that which makes the learner a unique being. The teacher cannot know the outcome of this responsibility as ‘the very structure of responsibility [is] that we do not know what we take responsibility for’, (Biesta, 2005:63). Responsibility, according to Biesta (ibid) is unlimited, because, ‘as Derrida argues, a limited responsibility is just an excuse to credit oneself with good conscience’.

The consequences of emergence are incalculable, and this responsibility is unlimited, yet there is no choice but to take action. I, as an adult in education, am indeed my brother’s and sister’s keeper. Responsibility and emergence are considered key to teaching and learning (Osberg and Biesta, 2007:47), and because educational relationships are challenging, Biesta proposes the building blocks for a language which puts an emphasis on relationships, on trust and on responsibility, as seen above. This, together with the ethics of engagement called for by Gilmour, Christie and Soudien (2012) and emerging consciousness, is what constitutes an education that meets the requirements of the third A, *Acceptability*, which refers to an education directed to the full development of human personality and to the strengthening of respect for human rights and fundamental freedoms, as stated in the introduction to this section.

4.3.3.3 *Assessment of the NDP in terms of Acceptability*

The NDP agrees that the school system is failing the learner, that it is unacceptable, and reduces the causes to two factors: firstly, and primarily, weak capacity in the civil service (teachers, principals and system-level officials). The second factor is the ‘culture of patronage’ that sees unsuitable staff being appointed (2011:270). Both factors are essentially failings of officials.³

By reducing the failings of the school system to individuals, the NDP uses a deficit approach to reform. A deficit approach is based on the assumption that the failings of a system are the result of individuals within the system (Goldspink, 2007:82). Goldspink (ibid) found that a non-deficit approach ‘opened up possibilities for institution-wide learning and such learning grew from the local area out’. Assigning blame does not change behaviour, it only diminishes capacity and fosters resistance (ibid). Stakeholders respond to being affirmed, and to feeling valued and respected, as seen earlier in this chapter.

The NDP again does not take cognisance of the complexity of education, as evidenced by the reduction of the failings of education to two causes. It appears unaware of the ethical implications of this reduction which sees officials being blamed for all the inequities and failings. These human resource failings, according to the NDP, will be ‘fixed’ through training to improve performance so that quantifiable targets are attained. This is a far cry from the building blocks of Biesta, or the ethics of engagement of Gilmour, Christie and Soudien, or the notion of emerging consciousness. It is unlikely that the implementation of the NDP will assist in raising the consciousness of teachers and learners towards transcending the current realities (and imagined realities).

³ (Another consequence of the primary cause is that it ‘breeds a lack of respect for government’ (2011:270) – an irrelevant consequence in the light of the failings of education, in my opinion, yet interestingly mentioned by the NDP. It raises the question whether a covert purpose of education is a nationalist agenda and blind loyalty to government).

4.3.4 Adaptability

An adaptable education system is a flexible system that can adapt to the needs of changing societies, and the needs of learners within their diverse social and cultural settings. For this it needs adaptable curricula and the adaptable deployment of the curricula content, (Woolman and Bishop, 2012:57-19 to 57-32).

4.3.4.1 *Intervention strategies*

Intervention strategies such as the curricula changes and campaigns discussed in chapter 2 have one goal in common: adapting to the needs of society by improving a specific target area in education through top-down curricula and intervention programmes. Based on evidence of the failings and of perceived best practice, the complexities of education are reduced and intervention implemented, but more often than not the desired effect is not achieved, as seen, for example, in the failings of outcomes-based education. More evidence is gathered, more best practice is highlighted, and so the cycle of failings repeats itself. Goldspink (2007:83) found that tight hierarchical control mitigated against the attainment of high levels of strategic coherence. He says,

[E]mergent insights into possibilities for strategic improvement arose where diversity and pluralism of perspective were encouraged and supported... The adoption of a 'best practice' orientation, with its attendant belief that models drawn from elsewhere, or identified in advance based on reductive analysis, can lead to effective change, was explicitly rejected. Contracts struck between the policy center and sites were based on establishing principles and relationships, not specifying outputs or mandating process (ibid).

Top-down, so-called best practice models to be followed blindly, do not allow for emerging insights or the integrity of the stakeholders at the interface. When interventions are imposed, relationships of trust do not necessarily emerge and the ability to adapt to the needs of the situation is compromised. Trust takes long to develop, but when it is established, deep commitment to change is achieved (81).

This is echoed by Biesta, (2010b), who asserts that an evidence-based approach to intervention strategies contributes to the lack of progress in education reform, and calls for a values-based approach, with evidence playing a subordinate role to values that constitute education practices. He supports his claim for a values-based approach by covering three aspects, epistemology, ontology and practice. Biesta (493) says that an evidence-based approach results epistemologically in a knowledge deficit, ontologically in an effectiveness or efficacy deficit and practically in an application deficit. These need further explanation:

4.3.4.2 *The three deficits of the evidence-based approach*

Regarding the *knowledge deficit*, Biesta says that evidence is gathered after the fact; evidence reflects what worked previously. In a complex system, evidence of what worked does not guarantee that it will work in future unless we are able to ‘encapsulate all factors, aspects and dimensions that make up the reality of education’ (494), in other words if we are able to model teaching and learning in its entirety and thus have complete knowledge of the system. This is not possible, because of the complexity of teaching and learning and the transience of knowledge claims. Biesta calls for an experimental methodology arising from a transactional epistemology, rather than a representational epistemology (495-496). A representational epistemology claims certainty in that it believes that what worked in the past can be extended to the future: it implies that cause and effect relationships can be established without doubt. A transactional epistemology says there is no guarantee that what worked in the past will work in the future, but we cannot ignore the lessons of the past as that would make us irresponsible (Gustafson, 2010:98, quoting Osberg and Biesta). Biesta calls the gap between what worked in the past (as gathered through evidence) and how this knowledge can be applied in the future, the knowledge deficit. He says there is a ‘gap between the knowledge we have and the situations in which we have to act’ (2010b:496). Not only is our knowledge of history a perception from our own life worlds, but as Osberg and Biesta (2007:43) say, knowing the present means experiencing the impossible, as whatever one knows now is transient as we have to ‘reassess our knowledge of the present in *the very moment we acquired it*’.

Osberg and Biesta go on to say (2007:47) that the rules of the past cannot dictate what should be done in future, as that would deny the renewal and possibilities of emergence. To illustrate this, Osberg and Biesta (ibid) quote Hannah Arendt:

Our hope always hangs on the new which every generation brings; but precisely because we can base our hope only on this, we destroy everything if we try to control the new that we, the old, can dictate how it will look. (Arendt, 1954/1961, p 11).

The control extends to standards set in education, measured by controlled and standardised assessment practices as quantifiable outputs to ensure consistency and comparability (Fenwick, 2010:57), despite the multitude of diverse locations and relations. Fenwick (ibid) says, ‘standards function to normalise practices by regulating and ordering these weaving relations’. Standards do not recognise the complexity of education as it does not necessarily allow for emergence, nor does it reflect the transience of knowledge. Standards are measured by assessment practices, as stated above. Biesta (2010a:9-10) says assessment is one of the ‘most explicit examples of retrospective complexity reduction’, on the one hand. On the other hand, it functions prospectively in the reduction of complexity. It is retrospective complexity reduction in that practices are validated, or not, after the event. It reduces complexity prospectively in that the anticipation of assessment reduces complexity. This happens because education is a recursive practice (ibid). Gustafson (2010:93) stresses that standards and testing ‘have cemented the inequality of cognitive capacities, talents, linguistic backgrounds, and comporment’. Even the language of standards and testing marginalises into worthy or unworthy categories such as readiness or no readiness (ibid). Fenwick (2010:65) goes further to say that standards reduce or control creativity that needs to emerge continuously for stakeholders to adapt to the complex system of education.

Creativity and imagination go hand in hand: if we cannot imagine the other, we cannot be creative. Teaching and learning, therefore, should be a ‘careful and responsible development of the imagination’ (Cilliers, 2005b:264). Imagining a better future means hope, instead of deferred hope that could lead to avolition or anti-social behaviour as was seen in chapter 3, 3.3.2.3 Deferred hope actualises in a disabling identity. Being able to imagine a better future also means vulnerability and taking risks because as Cilliers (ibid) points out, the nature of the risk we are prepared to take, is a function of our imagination.

This brings us to what Biesta calls the *ontological effectiveness or efficacy deficit*. An evidence-based approach relies on a cause and effect relationship, which results in an effectiveness or efficacy deficit in teaching and learning as it does not account for the non-linearity of interactions in complex social systems. Closed systems operate deterministically as causes result in effects that can be predetermined. Open systems in the social domain, such as teaching and learning, are complex with unpredictable choices being made by role-players. It is this openness and non-linearity that makes radical systemic transformation possible (Woermann, 2010a:125).

The third and final result of an evidence-based approach, is the *application deficit*. Biesta uses examples from the medical and agricultural field to illustrate how an evidence-based approach informs practice and to what extent resulting practices limit opportunities for people to think and do differently (Biesta, 2010b:499). He says applying scientific knowledge in the social domain misses important aspects of what enables the application of such knowledge, and calls this the application deficit of evidence-based practice. (500) ‘[T]he idea that practices can change through the application of scientific knowledge makes the work that is done to transform practices so that knowledge can begin to work[,] invisible’.

These deficits highlight the role of normativity, power and values in teaching and learning, according to Biesta (496, 500). He believes that what works should be secondary to the purpose of teaching and learning (the telos of teaching and learning).

4.3.4.3 Knowledge creation

Learning also refers to the self, or the system, and the ‘reality’ that has to be learned. This, in itself, is an emerging relationship, as that which has to be learned is what Osberg, Biesta and Cilliers (2008:213) call ‘unrepresentable’ and ‘incalculable’. Effective teaching and learning, i.e. adequate/available, accessible, acceptable and adaptable education, should enable us to adapt to an increasingly complex world, yet, as Nicolaides and Yorks (2007:233) warn, traditional models of teaching and learning seek ‘to control our environment’. Because of the need for a complex system to adapt to contingencies, such models intensify the experience of complexity. ‘In seeking control we are getting a false

sense of sustainability that is making us increasingly vulnerable' (ibid), and thus increasing our inability to adapt to a complex teaching and learning environment.

For Foucault, 'knowledge is the other key component of any social power field, interlaced in the exercise of power' (quoted by Baskin, 2007:4). Bauman, (1993:196) comments that access to knowledge is a 'major index of social standing' with experts 'trusted to be the repositories and sources of valid knowledge... [E]xperts [are] the crucial brokers of all self-assembly'. Knowledge has always been regarded as the key to power, on the one hand. On the other hand, Baskin (2007:4) asserts that the 'exercise of power depends on the individual's ability to employ that knowledge', in other words, to be a broker of one's own self-assembly, to use Bauman's term. Not only does a person need epistemic access, the individual also needs to use the knowledge in order to create more knowledge and to question its validity and power, as well as his role in the process. MacDonald and Sánchez-Casal, (2009:20) emphasise this point:

make students aware of how their identities... provide a lens through which to read the world; thus it challenges students to think about the fallibility of the truth, and about how they are distinctly implicated in the process of creating knowledge.

They (23) go on to say that a lack of awareness does not negate the link between identity and knowledge-creating in the classroom; it simply makes the connection invisible and inaccessible.

MacDonald and Sánchez-Casal (5) maintain that mobilising identity in the classroom is a necessary part of transforming knowledge-creation and working towards a more just and democratic society. Students must be aware that they should not be consumers of knowledge only; they are part of the process of creating knowledge. Similarly, alienation from one's role as a teacher and learner cannot be an option, nor is it an option to discount the ethics of complexity thinking.

As we have seen, Osberg and Biesta (2007:32) argue for a form of schooling concerned with questions of responsibility and response, and that an examination of the epistemological implications of emergence will assist. Knowledge creation should be a quest to

find more and more complex and creative ways of interacting with reality. Through doing this – through intervening in our own realities – we find out how to create more complex realities with which we can interact in yet more complex and creative ways (215).

Knowledge is not something to be received, but it is a response which ‘brings forth new worlds because it necessarily adds something (which was not present anywhere before it appeared) to what came before’ (ibid). Complexity thinking challenges knowledge as representation and calls for what Osberg, Biesta and Cilliers (213) term the epistemology of emergence. Representation purports to represent the world as it is, while complexity thinking asserts that nothing *is* in a relationship between the subject and the object, there is only emergence. In this relationship identity emerges and as we saw in chapter 3, 3.3.2.2, identity is epistemically salient. It is fundamental to all knowledge creation (Moya, 2009:51).

4.3.4.4 Assessment of the NDP in terms of Adaptability

The NDP is unequivocal on the importance of management systems, teacher subject competencies, money, status of teachers and training. It is also unequivocal on the purpose of teaching and learning, that is, responding to the needs of the economy. The following statement clearly illustrates that education is about producing human capital:

[h]ighly educated and trained individuals have much better chances in the labour market and a nation with highly educated citizens, particularly in science, engineering and technology, and the humanities is more competitive and will be able to participate in the knowledge-driven economy of the future’ (NDP, 2011:294).

A knowledge-driven economy is an evidence-based approach that produces business products and productive assets. The language is the language of power and marginalisation: one’s purpose is to be an asset to the economy by using knowledge to create wealth. The NDP gives no indication that it has considered the notions of complexity, identity formation or notions such as coming-into-consciousness, emergence and self-organisation.

4.4 CONCLUSION

In the South African public school context the effects of injustice, social exclusion and inequality are evident, as noted in chapter 2. For the majority of the learners education is a poverty trap perpetuating past inequities and reinforcing 'woundedness' (Ramphela in Swartz *et al*, 2012:36). The majority of the teachers and learners continue to be alienated from their roles (where alienation, according to Bloch and Nordstrom, (2007:17, is understood to be a removal of oneself from the troubling consequences of your work). One could add that teachers and learners are also alienated and removed from the troubling consequences of their environment and social conditions. Teachers and learners themselves are wounded and socially excluded, at the receiving end of structural violence, and participate complicitly in symbolic violence to increase their social stature.

An awareness of the above is required inside our classrooms and in every transaction / interaction in effective teaching and learning. It requires everyone becoming and being constituted through the ethics of complexity and identity formation, towards social justice.

However, Gough (2010:47) warns that the most common reaction to anxiety, fear and insecurity is to retreat into the politics of complexity reduction. This holds true for public policy, and a document such as the NDP is unfortunately no exception as we have seen. Instead of embracing the possibilities inherent in the interactions of a complex system, stakeholders are brought into 'closed circuits of corrective feedback in order to maintain stability and equilibrium' (51). Teaching and learning are complex systems that are open and operate in conditions far from equilibrium (Cilliers, 2005a:122); they self-organise towards criticality and therein lies their transformative potential, as discussed in the previous chapter. Trueit and Doll Jr (2010:137) use complexity 'as a word that signifies a dynamical self-organising process within which we are embedded, embodied, emboldened'. Complexity thinking 'encourages us to recognise the limitations of human thought and also enables us to acknowledge unseen possibilities, inherent in any situation, as creative potential' – embracing what is already present in interactions, instead of thinking in terms of reducing (135). This will enable us to see 'possibilities as yet unseen in the policies, practices and politics of schooling and education' (136).

If we accept that education is a complex system, we accept non-linearity, recursivity, emergence. We should be suspicious of models that ‘assume linear thinking, control and predictability’ (ibid). It is only when we accept that there are limits to predictability and control that we will see the gaps between ‘inputs’ (policy, curriculum, pedagogy) and ‘outputs’ or ‘products’ (learning, knowledge, subjectivities) as sites of emergence (Gough, 2010:48). These ‘outputs’ and ‘products’ emerge in and through educational practices in unique and unpredictable ways (ibid). Only then can teaching and learning become sites of emergence of knowledge and skills, socialisation and coming into presence of unique beings (Biesta, quoted by Gough, 2010:48. Also see section 2 of this chapter).

Education is not about participating in a finished universe, it is the result of all stakeholders participating in the creation of an unfinished universe (Osberg, Biesta and Cilliers, 2008:215). It is indeed actioned teaching and learning. Education is a ‘journey into the unknown’ (Trueit and Doll Jr, 2010:138), in which teachers are teachers and learners; and learners are teachers and learners. Through complex conversations (146) teachers and learners enter into the unknown by exploring questions for which the answer is not known. Together, in relationship, they explore differences and develop critical interpretation and creative ability (ibid). Through this process learners become teachers, and teachers become learners who know ‘there is more than one best way’ (ibid). This is in the spirit of what Huebner (in Trueit and Doll Jr, 2010:138) calls ‘moreness’, that is to admit our own finitude and ignorance, or as Cilliers (2005b:265) puts it, to ‘resist arrogance of certainty and a self-sufficient knowledge’. As active ‘being[s]-in-relation’ (Trueit and Doll Jr, 2010:136), we must understand that what we know now is transient; whatever our limitations are now, it can be transcended. This spirit of ‘moreness’ is the source of hope (ibid). It is in our relations with ourselves, with one another and with the environment, that this hope can be actualised.

It is important to note that hope is actualised in the process of identity formation, that is, in our relations. National intervention plans, such as the NDP, need to be supplemented by an approach that takes complexity and identity formation into account. The importance of contingent, localised interactions cannot be over-emphasised. We have to start in the most direct relationship at any given time, as stated in the concluding remarks on complexity thinking in the previous chapter. De Villiers-Botha and Cilliers (2010:37) remind us,

As entities embedded within complex social environments, we have to make use of various meaning-given frameworks and assumptions. Since we cannot step out of our complex environment to view these frameworks omnisciently, we have to make choices based on the contingent, local knowledge and options available to us.

We co-create local knowledge when we take responsibility for one another; we therefore in part determine what bifurcations will be available at any point in time, in a given context. In these interactions of fairly short-range relationships, meaning emerges, and identity is constituted. These relationships determine the nature of the complex system as large-scale features emerge even when there are only local interactions among units (Cilliers, 2005:98). The ethical choice towards transformation is in the contingent and local, not in blame, investigations, control and delivering quantifiable targets, as per the NDP. Transformation in education lies in the ethical choices of the beings that are coming into presence, but also in the ethical choices of the morally competent who have the power to create enabling conditions. If the morally competent take their responsibilities seriously, people living in social exclusion, such as marginalised teachers and learners, can be enabled, as seen in chapter 3, 3.3.2.3. We have no choice but to do so. I conclude by repeating Moya's warning (2009:48):

Because the identity contingencies we are likely to face have potentially debilitating effects on our live-chances, we ignore the dynamics of identity at our peril. To the extent that we are interested in transforming our society into one that is more socially and economically just, we need to know how identities work in order to effectively work with them.

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