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Guest Edited by

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Editorial

Sechaba Mahlomaholo* and Milton M. Nkoane**

This is a special issue of *Journal of Higher Education in Africa* (JHEA). Its title was the theme of the 6th International Colloquium on Sustainable Rural Learning Ecologies (SuRLEC)/Sustainable Learning Environment (SuLE) research team which was held from 29–31 October 2014 at the University of the Free State's QwaQwa campus, South Africa. The aim of the colloquium was to stimulate debates on how to develop an interdisciplinary, inter-institutional and international research rigour and culture. This aim was realized through the creation of an intellectual space where students, academics, theorists, researchers and practitioners of education and beyond came together for intellectual engagement. Scholarly pieces were presented by postgraduate students and academics to share their research work from different universities in South Africa (for example University of Venda, Tshwane University of Technology, University of South Africa, University of Johannesburg, University of KwaZulu-Natal), and international scholars came from Lesotho, Senegal, Zimbabwe, Australia and Jamaica. There were scholarly pieces presented by practitioners, for example by colleagues from the National Research Foundation.

Focus and discourse at the colloquium was on rurality and rural education which have, in many societies across the world, been perceived from a deficit frame of reference. The purpose of the colloquium was to achieve two goals. The first goal was to profile rural learning ecologies as sustainable spaces that require the reciprocal assistance of social justice, resilience, sustainability and development, to encourage discourses around rurality and rural education and encourage research in this focus area. The second goal of the colloquium was to unleash positive and powerful untold stories about rurality and rural education.

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The summary below gives the international and local flavour of the scholarly pieces that were part of the colloquium's proceedings. These are peer reviewed selected articles. Ato Kwamena Onoma in his paper 'Surpassing the Spectre of Impossibility: Ideational Impoverishment and the Quest for Sustainable Rural Learning Ecologies in Africa' makes an argument about the idea of sustainable rural learning ecologies in Africa which seems to constitute a contradiction in terms. His argument is that rural Africa seems to represent the opposite of the ideal setting for sustainable learning ecologies, which cultivate open, questioning and investigative spirits while fostering the acquisition of knowledge and skills. This paper shows that the deliberate creation of sustainable rural learning ecologies is warranted by peculiarities that position rural spheres as ideal domains for cutting edge learning on some of the most important questions in an Africa undergoing rapid transformation.

This line of argument was supported by Tshele John Moloi in his paper titled 'Using Indigenous Games to Teach Problem-solving in Mathematics in Rural Learning Ecologies' which explores the use of *morabaraba*, a board game, as an example of indigenous games which can be used to teach problem-solving in mathematics. This study is informed by a theory of community cultural wealth that posits community members as experts in finding their own solutions to local issues and the existence of knowledge which learners possess but is not used in the teaching and learning of mathematics. This article taps into the marginalized knowledge of subaltern communities to teach problem solving.

Milton M. Nkoane in his piece 'Sustainable Rural Learning Ecologies: A Pathway to Acknowledging African Knowledge Systems in the Arena of Mainstream of Knowledge Production?' proposes an idea of African scholarship and rural learning ecologies as a transformational agenda for knowledge construction. The paper conceptualizes sustainable learning ecologies as acknowledgement of knowledge construction within rural contexts embedded in African value systems. This article emphasizes the celebration of knowledge construction in these contexts as having comparative and competitive advantage on the global discourse. The paper concludes by dismissing views that any one pyramid of knowledge is by its nature superior to others.

Cias T. Tsotetsi and Sechaba Mahlomaholo's article titled 'Exploring Strategies to Strengthen Continuing Professional Development for Teachers in Rural South Africa' makes an argument about the professional development of teachers as a cornerstone for the provision of quality teaching and learning. Focus is on the competencies of teachers in South Africa which seem not to have improved as envisaged. This scholarly piece addresses this challenge by developing a strategy that could be employed to implement professional development programmes, drawing from a study conducted in two rural secondary schools in the Free State province. Findings from this study that used partici-

patory action research show distinct components of a strategy: establishment of a team comprising of stakeholders, creation of a common vision, drawing up a strategic plan, monitoring procedures, suggesting possible ways of improving on weaker spots.

Sylvia M. Ramaligela, Ugorji I. Ogbonnaya and Andile Mji in their article titled 'An Investigation into the Effectiveness of the University Curriculum in Preparing Pre-service Technology Teachers' look closely at the effectiveness of the university curriculum in preparing pre-service technology teachers. They examine the course guide of technology education course against the backdrop of the Grade 7–9 (senior-phase) technology policy document in South Africa. Their finding is that the university technology curriculum places emphasis on both content breadth and content strands. They argue for students to be given an opportunity to explore both content breadth and content depth as well as how content strands can be used to develop a deeper understanding.

Lebusa Monyooe in his scholarly piece 'From Cradle to Grave: Transforming South Africa's Learning Ecologies' examines key organisational principles that underpin responsive transformation strategies that have potential to create spaces for critical engagement with basic education post the 1994 democratic elections in South Africa. This paper focuses on the deeper elements for transforming schools into sustainable learning ecologies. The paper concludes with plausible interventions that a country may deploy to improve education quality and system efficacy.

Thabiso Nyabanyaba in his article 'Improving the Quality of Education Among Rural Learners Through the Use of Open and Flexible Approaches in Lesotho's Secondary Schools' shows how Lesotho's learners continue to suffer from high dropout rates at primary level and poor access rates at secondary level particularly in rural areas. This paper highlights interruptions to schooling caused by poverty and the HIV/AIDS pandemic among learners in rural areas in Lesotho. The article demonstrates the sustainability of affordable initiatives in terms of improving quality of education among rural learners through the creation of circles of support.

Willy Nel in his article 'Transformative Autonomy: Mixed Notes from Teachers to Higher Education' makes an argument that transformative autonomy is 'the form of autonomy in which school role players, have the urge to be involved with fellow role players in education development initiatives towards social transformation which contributes to democracy'. Here focus is on narrowing the gap between teaching practice and societal concerns since it recognizes that teachers do have a certain degree of autonomy over their professional practice but also a responsibility towards the evolving South African democracy. A key finding of this study is that participants generally acknowledged their control over curriculum aspects and some degree of control over matters of discipline.

The main conclusion is that participants display an intuitive understanding of their autonomy as teachers but still do not have a clear idea of how to link their expertise to societal transformation.

Maleho Letloenyane and Loyiso Jita through their paper titled "School-university Partnerships for Professional Development of Teachers: A Case of Lesson Study Intervention in Mathematics" show how school-university partnerships for professional development of teachers continues to be used extensively in South Africa to enhance the quality of teaching and learning, especially in mathematics. Their paper assesses the impact of partnership, which resulted in perceived changes in teachers' instructional practices and curriculum decisions after intervention. The findings provide some empirical evidence that partnerships of this nature, between schools and universities, may prove valuable in attempts to improve the teaching of school mathematics, especially in the South African context.

Dipane Hlalele, Desiree Manicom, Julia Preece and Cias T. Tsotetsi, through their paper titled "Strategies and Outcomes of Involving University Students in Community Engagement: An Adaptive Leadership Perspective" compare how students and community members learned and applied their knowledge in four small scale university-community engagement projects. This paper draws on the concept of adaptive leadership as an approach and analytical tool. The findings suggested that the adaptive leadership approach contributed to stimulating shared ownership of learning.

Molaodi Tshelane and Secheba Mahlomaholo in their article titled "Creating Sustainable Learning Environments for Professional Curriculum Leadership Through Information and Communication Technologies" demonstrate how diverse school community members constructed a framework for the integration of ICT in the development of its professional curriculum leadership practices. This paper concludes by showing that performance reflected through professional curriculum practices, and strategies could contribute towards the creation of a sustainable learning environments.

Makeresemese R. Qhosola in her paper titled "Accounting Teacher Preparation: A Critical Accounting Perspective" provides an analysis of how the preparation of accounting teachers from the perspective of critical accounting as a theoretical framework. This paper argues that there are challenges in the FET school accounting classrooms and it seems that teachers struggle with content and pedagogical knowledge. This paper concludes by arguing that critical accounting is a means of reflecting or interacting with accounting information in order to challenge hegemonic and counter-discourse that disempower and marginalise the subaltern communities.

Sechaba Mahlomaholo in his scholarly piece "Creating Effective Postgraduate Learning Environment: An Analysis of an Intervention from Realist Social Theory" makes an analysis of two illustrative reports of the external examiners on some manuscripts of postgraduate students. The analysis in this article shows how sustainable postgraduate learning environments facilitate good academic performance. Prominence is placed on working together of the actors' emotional and cognitive aspects. The reports indicate how academic performance is influenced by validation through a caring learning environment and the opposite of poor performance could be a mirror image of problems in this interaction. The paper concludes by arguing that agency and structure can and should not be collapsed into each other, even though the two co-constitute each other.

This special issue and the 6th SuRLEC\SuLE colloquium would not have been a success had it not been for the selfless intellectual contributions of scholars, researchers and practitioners who demonstrated an interest by troubling the discourses that communities are battling with around the globe. In this case the special focus is on the African context.

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Surpassing the Spectre of Impossibility: Ideational Impoverishment and the Quest for Sustainable Rural Learning Ecologies in Africa

Ato Kwamena Onoma*

Abstract

The idea of sustainable rural learning ecologies in Africa apparently constitutes a contradiction in terms. Renowned for its provincialism, rural Africa seems to represent the opposite of the ideal setting for sustainable learning ecologies, which cultivate open, questioning and investigative spirits while fostering the acquisition of knowledge and skills. This rural landscape that is often seen as the den of parochialism is the outcome of colonial and postcolonial policies and processes of ideational impoverishment; the contrived nature of what we have come to see as the rural open space for creating and perpetuating sustainable rural learning ecologies. Pursued as a forward-looking project, the deliberate creation of sustainable rural learning ecologies is warranted by peculiarities that position rural spheres as ideal domains for cutting-edge learning on some of the most important questions in an Africa undergoing rapid transformation.

Résumé

L'idée des environnements d'apprentissage ruraux durables en Afrique constitue apparemment une contradiction dans les termes. Réputé pour son provincialisme, le milieu rural africain semble représenter l'opposé de l'endroit idéal pour les environnements d'apprentissage durables, qui cultivent l'esprit ouvert, le sens du questionnement et de l'investigation, tout

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en favorisant l'acquisition de connaissances et de compétences. Ce paysage rural qui est souvent considéré comme le repaire de l'esprit de clocher est le résultat des politiques et des processus coloniaux et postcoloniaux d'appauvrissement idéel; la nature artificielle de ce que nous percevons comme milieu rural ouvre un espace pour la création et la perpétuation des environnements d'apprentissage ruraux durables. Qualifié de projet d'avenir, la création délibérée d'environnements d'apprentissage ruraux est justifiée par des particularités qui présentent les sphères rurales comme des domaines idéales pour l'apprentissage de pointe sur certaines des questions les plus importantes dans une Afrique en mutation rapide.

Introduction

The idea of sustainable rural learning ecologies in Africa apparently constitutes a contradiction in terms. The rural has over time come to be synonymous in the minds of many with provincialism (Isaacman 1990: 48; Binns 1987: 77; Uzzell 1979: 333–34) and tradition understood as the repetition over time of frozen cultural traits. Spaces characterized by such ideational impoverishment cannot constitute sustainable learning ecologies. This is because learning involves the cultivation of an open, questioning and investigative spirit as well as the acquisition of knowledge and skills, and requires mental outlooks characterized by openness that are very different from those that we have come to associate with rural zones in Africa.

If rural areas have come to represent the epitome of ecologies antithetical to learning, we have to understand this as the fruition of elaborate colonial and postcolonial state policies and practices. Colonial administrations invested greatly in constructing rural communities as zones of unadulterated tradition (Mamdani 1996: 81). These were opposed to urban areas understood as zones of modernity where Africans tended to become 'deracinated' (Dougan 2004: 34–36). Further, even these rural zones of tradition were compartmentalized as closed ethnic reserves (Mamdani 1996). Postcolonial authorities often built on this ethnicization of rural territories, with the dawn of democratization processes in the 1990s only intensifying this cultivation and exploitation of parochialism (Geschiere and Nyamnjoh 2000).

Understanding ideational poverty as a *contrived* condition opens up possibilities for the deliberate crafting of sustainable rural learning ecologies. If rural zones could be deliberately crafted as ecologies that are directly antithetical to learning, purposely-guided action can go towards creating sustainable rural learning economies. This effort has to go beyond recapturing rural pasts of openness to involve challenging the exploitative and discriminative underbelly that tainted rural incorporative processes. Finally, sustainable rural learning ecologies will only stand out as uniquely privileged learning environments

if they are rooted in the reflexive exercise of considering what it means to be 'rural' in a changing Africa.

The difficult task of engineering sustainable rural learning ecologies is warranted by the peculiar advantages rural spheres in today's Africa possess as potential centres of cutting-edge innovative research and learning that can help birth the Africa we want. Rural zones are the epicentres of some of the most important phenomena that concern research in the social and natural sciences. These range from struggles over land rights and natural resource exploitation to epidemics and infrastructural development. Also, the greater material needs of rural environments furnish excellent opportunities for socially responsible applied learning.

The Spectre of Impossibility

Modern schooling in Africa is unfortunately too often trapped in the cocoon of knowledge acquisition through instruction. Here, the known is passed on from teachers to students through processes of instruction that are at once hierarchical and mediated by distance between active teachers imparting knowledge and passive students learning/receiving such knowledge. Added to this has often been the temptation to confine learning to the acquisition of 'practical skills' (Mkandawire 2011: 15).

Steeped in the continent's colonial history and often twinned with universities in the colonial metropolis (Assie-Lumumba 2006: 31; Olukoshi 2006: 537), it is unsurprising that institutions of higher education in Africa tended to replicate the hierarchies and distancing that characterized many of their 'parent' universities in the global North as well as the colonial environment in which they were born and had to operate (Aina 2010: 29–30). While cloaked in discourses about the need to equip Africans with the practical skills needed to take over governing responsibilities, the insistence on the teaching of 'practical skill' during this period partly served a more sinister end. It sought to direct Africans away from processes of contemplation that sometimes tended to lead to them questioning the fundamental injustices of colonial systems (Assie-Lumumba 2006: 33).

A lot has been said about continuities between colonial systems and post-colonial regimes in Africa (Ndlovu-Gatsheni 2013) and the field of higher education is one area in which these continuities are evident. As in colonial times, states' insistence in education policy on the acquisition of practical skills was portrayed as necessary for the imperative of development. Knowledge for knowledge's sake was seen as a luxury that African countries that had to 'catch-up' could not afford to invest in. These policies skewed support in favour of those disciplines seen as 'practical' and 'useful' and sometimes

led to the closure of departments seen as less useful (Mkandawire 2011: 15; Assie-Lumumba 2006: 45; Zeleza 1992: 12). As in the colonial era, the politics behind this skewing and closures went beyond making sure universities served the 'needs' of countries to reinforcing authoritarian political interests. Disciplines seen as subversive of established authority in a time of civilian and military authoritarianism, which was deeply hostile to reflection and critical thought, were the ones that often fell under the axe (Assie-Lumumba 2006: 80).

If the state in both its colonial and postcolonial forms has tended to privilege learning as the acquisition of practical skills through instruction, the market has been no kinder to more participatory and reflective modes of learning. Liberalization processes across Africa since the 1980s have pushed many public universities into treating education as just another service on the market. What sells is seen as what should be produced. 'Practical' courses that are seen as offering the greatest chances of immediate employment in economies characterized by high levels of unemployment have gained increasing ascendancy. Departments and courses that do not sell have often been starved of support (Olukoshi 2006: 538; Assie-Lumumba 2006: 80). Where they have survived, some of these more reflective courses have been increasingly framed as handmaidens to, and minor elements of, larger market-favoured programmes in management, economics, information and communication technology, and so on. This has meant their being shorn of the contemplative elements that are core to them. 'Crass vocationalization' is how Mamdani has rightly labelled this process (2007: 54).

The growth of student populations in many public universities, often unmet with significant increases in the facilities and staffing of these institutions, has further promoted the flight from critical reflective activity. Declining support for universities was partly the result of World Bank insistence on the focus of funds on primary education on account of what they saw as its greater dividends (Mkandawire 2011: 15; Mamdani 1993: 10). Large classes have resulted in the further minimization of participatory approaches to teaching and the privileging of objective type questions even in courses in Philosophy (Mamdani 2007: 147–75).

Dynamics in public universities have to be seen, in some ways, as efforts at maintaining their dominance in the face of competition from private universities that have mushroomed across the continent after the liberalization of economies. Rising in number, many of these private institutions have come to typify a radical market approach to education. They often display unabashed market orientations in the choice, design and delivery of courses with little regard for basic research or courses in the humanities and social sciences that focus on critical reflection on social phenomena (Effah 2006: 68–69; Aina 2010: 29; Assie-Lumumba 2006: 106–7).

In the world of donor funding there has been a related emphasis on 'policy research' at the cost of basic research. These studies and the 'consultancy reports' that result from them are often driven by very specific policy questions and needs, are short-term in character and often lacking in scholarly rigour. Donors and some in the policy industry often cite the same need to 'address practical questions' and 'show tangible results' for resources (Olukoshi 2006: 541; Zeleza 1992: 23) in tones that have sometimes assumed a totalitarian hue that tends to delegitimize basic research as useless or at best unnecessary.

The fact that many of such consultancy reports draw heavily from basic research (sometimes without proper citations), are extremely presentist and lacking in fundamental insights is not emphasized (Mkandawire 2011: 23). Also neglected is the fact that even basic research done without policy or applied use in mind can, down the road, impact on policy and lead to real world applications. The utility of basic research in the formal educational system is also often elided.

Contrary to this emphasis on learning as the acquisition of the known, here I employ learning to mean something that goes far beyond the acquisition of knowledge and practical skills. Understood in the sense of the term 'cultivation,' it means above all else the acquisition of the propensity and skills to learn. It involves the acquisition of an interest in the world and the ability to notice interesting patterns in the mundane as well as the development of the propensity to be puzzled by aspects of what normally passes as usual and normal. It also includes cultivating the ability to frame investigable questions out of these puzzles and to investigate these through systematic research.

Understood as the cultivation of these deep faculties, learning is anchored in the willingness to live in an unstable world where much *could be unknown*. It is a costly psychological exercise that involves the ability to entertain and even embrace uncertainty. It diverges markedly from sheltering in the safety of tradition. Tradition involves the comfort of ostensibly *re*producing known worlds repeatedly (Gyekye 1997: 219). It involves the safety of repetition. Learning as used here requires the scholar to continually destabilize her world by repeatedly raising fundamental questions about it. This understanding of the process of learning is best captured in the thoughts of the Council for Academic Freedom and Democracy on the mission of academic institutions:

> [ext] Whatever else they may be designed to do, academic institutions of all kinds and at all levels must be critical. They must be committed to re-examining accepted knowledge, assumptions and practices. It is their job, whatever other jobs they have, to nurse skepticism and to apply it to established beliefs and the present order of things. Education

> and research must be intellectually and socially dangerous (quoted in Ali 1994: 110). [ends]

As an exercise that goes beyond the rote acquisition of the known to involve cultivation of the willingness and ability to escape tradition and to reflect on and rethink modes of being, learning tends to require all that rural environments have come to be seen to lack. Rural spaces are seen as the epitomes of ideational poverty in being closed and impervious to new ideas and outside influences. At one level, this closedness is the characteristic of systems. The rural has been portrayed as the preserve of tradition since the era of colonization (Mamdani undated: 7–8; Bryceson 1997: 9). Defined as 'that which is handed down from the past [and] has endured through generations' (Gyekye 1997: 219), tradition represents the repetition of the known and the *re*enactment of well-worn scripts. It denotes a bulwark against the new and the 'strange'. Seen in this light, the rural stands out as the opposite of what the urban has come to be associated with: 'modernization, social progress and cultural innovation' (Yankson and Bertrand 2012). The work of scholars like Ekeh (1975) have not succeeded in exploding the pervasive equation of 'rural' with 'traditional' and 'urban' with 'modern'.

Rural provincialism is also a matter of individual traits. Rural residents are often portrayed as closed-minded. This goes beyond the fact that they are not exposed to new ideas to the stronger claim about their unwillingness and lack of capacity to open up to new things (Hugo, Champion and Lattes 2003: 279) as well as their lack of capacity for higher-level intellectual thought (Scott 1985: 308; 1990: 136–82).

If learning is about openness to questioning the fundamental bases of society and of our existence, it is not difficult to see how it is counter-intuitive to place the rural and the process of learning side by side.

Contrived Impoverishment: The Rural Moral Bias in Africa

Much has been written about the urban bias in Africa where, as the seat of colonial administrations and home of important sections of European communities that were located in the colonies, cities received more than their fair share of investment in services relative to rural areas. Roads, running water, electricity grids, health facilities and good schools were often disproportionately concentrated in urban areas, with some rural areas that proved particularly economically profitable to colonial administrations following suit (Konadu-Agyeman and Shabaya 2005: 133). Even as postcolonial states have done more to bring services to constituencies beyond those served during the colonial period, their policies have been characterized by the same bias towards urban areas that was observable under colonial rule. Economic

investment, education, health, electrification and transport infrastructure are all areas in which rural areas lag significantly behind their urban counterparts (Konadu-Agyeman and Shabaya 2005: 134–40). Rural-urban disparities in Africa often make for gruelling reading, with Brookfield noting how 'growth rates are low, land degradation is widespread, and poverty remains rampant' in rural areas (Brookfield 2006: 229).

Some have highlighted issues of corruption and limited state capacity for planning to explain this phenomenon (van de Walle 1989; Konadu-Agyeman and Shabaya 2005). The predominant explanation, however, focuses on the relative mobilizational capacity or urban constituencies relative to rural ones (Bates 1984; Wiseman 1986: 510; Scott 1985). Import-substitution industrialization models that also tended to favour urban areas are partly to blame (Nafziger 1988: 147–49).

Worthy of note though is the fact that this material bias in favour of urban constituencies has consistently gone along with a second and countervailing bias. That is the moral bias in favour of rural areas. The reinvention of the rural past was an elaborate activity that posited a dichotomy between rural areas that were portrayed as spaces of pure and authentic traditions and cultures and urban spaces that were seen as zones of mixture, pollution and cultural decay (Dougan 2004: 33–36). This dichotomy was an explicitly moral one where the good (for which read 'submissive') African was often portrayed as someone who had stuck to her rural traditions and had escaped the contamination of foreign influences (Bryceson 1997: 9; Mamdani 1996: 81–82). She was opposed to the 'deracinated' African, very often of the urban milieu, who was seen as 'vice incarnate' (Wyse 1989: 46). The fact that this ran counter to the narrative of the colonizing mission as an effort to civilize Africans by moving them from the 'darkness' of their cultures to Western 'light' has been noted by Assie-Lumumba (2006: 32). This valorization of rural spheres as the sites of morality is a phenomenon which has characterizesd discourse and practice beyond the African context (Cronon 1991).

It is in this context that we have to understand the rural milieu as the epitome of the environment that *cannot* sustain learning ecologies as contrived in the double sense of the word. It does not represent the 'natural' state of the rural or of rural life as it has always been. It is the effect of deliberate colonial and postcolonial state policies and activities. But it is contrived in another sense. Making the rural was about remaking the past just as it was about building a future. The two moves were intimately connected and the reinvention of a 'rural past' served the future-oriented goal of creating understandings of rural (and by implication, urban) spheres that would fit into colonial logics of control and appropriation.

Cultural elaboration in rural settings was defined essentially as a practice in repetition. Ideational impoverishment here took both vertical and horizontal forms. Dynamism understood as a vertical process in which cultures got to surpass themselves was imagined out of existence and rural cultural elaboration came to take the form of the elaboration of traditions that were uncontaminated by external influences. The fact that these narratives were challenged by dynamism in rural practices and outlooks that sometimes matched urban ones was often noted by scholars and colonial administrators alike. One way in which this 'problem' of rural dynamism and change was dealt with was by layering change with narratives and assumptions of perpetual stability (Tenga 1987: 39–40). Another way of dealing with these inconvenient deviations was to portray them as evidence of the impact of corruptive influences on these pristine traditions. People had temporarily (and regrettably) lost their way and colonial authorities sometimes then assumed the role of 'correcting' these deviations by returning people to 'their' traditions (Mamdani 1996: 81–82).

This process of restoring traditions sometimes took the form of seeking to arrest the evolutions through official policies and practices. In Ghana rapid transformations in rural land tenure arrangements were the target of such efforts in the first half of the twentieth century. The advent of cocoa cultivation and mineral prospection in the Gold Coast colony had led to the increasing commercialization of land, the individualization of land rights, the formalization of transactions through documents and speculation on land in rural areas in Akyem Abuakwa (Addo-Fening 1980). Most of this went counter to the colonial lore on 'African land tenure systems', which portrayed them as communal, with chiefs holding managerial interest in land. These chiefs were said to give usufruct rights to users in transactions that were free of monetary exchanges as well as formal documentation (Onoma 2009). The West African Lands Committee, which conducted investigations into these matters, saw through this narrative and detailed the rapid evolution towards more individualized and formalized transactions taking place. When it recommended the formal recognition of individual rights, this was rejected out of hand by Governor Clifford of the Gold Coast, who was wary of eliminating a key tool that chiefs used to control commoners on behalf of the colonial government (Onoma 2009).

Congealing traditions in the face of transformations was not the sole weapon deployed in the remaking of the rural past. Sometimes, the elements of the past to be congealed were themselves the product of colonial fabrication. The colonial authorities sometimes made up the 'eternal' traditions that they then went on to safeguard against 'contamination' by external influences. There is a lot of evidence of 'invention' by colonial authorities as they sought

to impose and institutionalize control and authority. Victorian norms of the status and role of women, gender relations and sexuality were often as much to 'credit' for colonial discourses on African traditions as the lived realities of these societies (Oyewumi 1997). There was also the unwarranted generalization of observations from parts of the continent due to the vital role of certain colonial administrators like Lord Lugard who acted as norm entrepreneurs within colonial empires (Mamdani 1996: 44–81).

Ideational impoverishment also took a vertical form in which the colonial enterprise reinforced the idea of rural areas as closed spaces by imagining them as ethnic enclaves. Dynamism understood as processes of borrowing, of mixture and of hybridization became unimaginable. Each rural community was not only the space of unadulterated traditions, but was also the preserve of only one such tradition. Territories were often carved up into ethnic homelands that created autochthones and 'strangers'. The lines between these groups were inscribed in narratives of blood and ancient origins that gave little credence to residence and process as means of acquiring citizenship (Mamdani 2005: 6; 1998; Wright 1991: 73–75).

It is imperative to underscore the creative character of this exercise. The colonial authorities often fashioned legible spaces instead of just mapping them. There are instances where this process of creation involved the physical removal and (re)settlement of people as was seen with the forced removals in South Africa (Hallet 1984). The Bantustans in South Africa are excellent examples of this process of separation. In many areas in Africa, these 'histories' of separation were often simply 'legislated' or written into being even in the face of many facts to the contrary.

Mapping activities and anthropological studies by colonial officials and researchers very often revealed the extent to which this exercise of creating closed pure communities was contrived. Jacques Germain, an assistant to the *Commandant de Cercle* of N'Zérékoré Cercle in the Forest Region of Guinea, carried out research in that area in 1946 and 1947. It was part of the effort of the French authorities to create a 'complete inventory' that captured 'the significance of the name, constitutive clans, the origins of the clans, their totems, and the history of each village since its formation' (Germain 1984: 73). Some of the things Germain observed were rather inconvenient in light of the colonial division of the Forest Region of Guinea into neat tribal *cercles*. It was discovered that cantons often had villages made up of people who spoke languages other than the language of those to whom the canton was said to 'belong'. Worse still, villages often had people of different cultural and linguistic backgrounds living side by side. Political entities were generally multi-ethnic. There was active ongoing mixture of groups. Identities were dynamic. As people moved

around they deliberately changed their identities. Violent conflicts occurred between villages dominated by different linguistic groups but these conflicts were just as likely to happen between villages dominated by the same linguistic group. A lot of violent conflicts had little to do with ethnic or 'tribal' interests and instead were fought over the private interests of leading political figures (Germain 1984: 71–77).

These 'inconvenient facts' that tend to lacerate the schema of ethnic homelands even today did little to curb the colonial appetite to invent neatly closed-off spaces. The endurance of these fabrications and their reinforcement and exploitation by postcolonial leaders is part of the reason for violent internecine conflicts in many African countries including Guinea, Liberia, Côte d'Ivoire, Kenya and the Democratic Republic of Congo. The multiplicity of processes challenging the imposition of ethnic maps on social landscapes has often not dampened enthusiasm for the intonation and deployment of ethnic logics in scholarship on, and political practice in, Africa (Onoma 2013: 134–57).

The Imperative of Sustainable Rural Learning Ecologies

Overcoming the seeming impossibility of creating and perpetuating sustainable rural learning ecologies is an imperative for the economic and hence political and social advancement of many African countries. The difficulty of the task of surpassing the spectre of impossibility is well matched by the importance of achieving that task.

A primary reason for this is the fact that the rural sphere is the site of some of the most interesting processes that draw the attention of researchers in the social and natural sciences. We cannot even begin to understand these issues without studying rural spaces and *studying in* rural areas. 'Studying rural areas' can be understood in the narrow sense of extracting data from the rural sphere during field research for analysis in urban centres of learning. But more intense relationships between the researcher and researched that I will argue for later means that continual interactions between the researcher and the phenomena studied are important both at the stage of data collection and analysis. These intimate relations that are borne of continual interactions enrich research by allowing the researcher to continually refer to and garner insights from the researched. It is partly for this reason that the actual location of centres of learning in rural areas is vital to making sense of these processes.

Agriculture is one such process. A predominantly rural phenomenon, it is responsible for 32 per cent of Africa's GDP and 65 per cent of employment on the continent (World Bank 2014). The continuing importance of agriculture to the economies of African countries points to the failure of many countries to transform their economies in the direction of manufacturing and the service

sector. Understanding how this sector is faring, the issues that affect it and its impact on society all fundamentally require research that is at least in part based in rural areas.

The related issue of land rights is another such phenomenon. Of extreme importance in a continent where people's livelihoods more often than not are tied to the land, it has become the lightning rod for tensions and internecine violence in many countries in Africa (Onoma 2009). The recent spate of land grabbing by foreign countries and multinationals across the continent has only heightened tensions around this resource (Cotula 2013). The rural location of much of this contention and violence again makes its understanding heavily dependent on research on and in rural areas.

Tied to land rights is the question of natural resource exploitation. Partnering agriculture as a key element in the heavy dependence of many African countries on trade in primary goods, natural resource exploitation is often carried out in rural areas across the continent. This includes both legal and extra-legal mineral extraction. Proper exploration of the intricacies of this sector must be at least partially based on work in rural areas.

The increasingly important issue of climate change also requires much work in rural areas for its comprehension. On account of the continent's dependence on rain-fed agriculture and its underdevelopment, climate variability is likely to heavily impact on rural livelihoods (Mongi, Majule and Lyimo 2010: 371; Mkandawire 2011: 10). Deforestation and reforestation, which are implicated in discussions around mitigation, will also require a focus on rural spheres. Because of the heavy use of wood for fuel in rural areas, adaptation and mitigation efforts that focus on introducing cleaner energy sources must also pay significant attention to rural areas. Adaptation methods whose concerns include rainwater harvesting for agriculture will also have to pay attention to the rural milieu.

Research and research institutions on health and health technology also have a lot to gain from adopting rural homes. For example many diseases assume peculiar quantitative and qualitative dimensions in rural areas on account of the greater deprivation of these rural communities (Eager 2014). This makes rural-based research on them that pays attention to their particular rural manifestations important.

The fact that this continent, despite its rapid urbanization, is still predominantly rural means that the study of life, work, leisure, family and so forth in the humanities and social sciences cannot be complete without focus on the rural realm.

The emphasis on the need to physically locate centres of learning in rural areas, in addition to orienting their work towards the rural, is partly also borne out of the significant opportunities for Socially responsible learning

that exist in rural areas. The deprivation suffered by these areas as well as their involvement in important processes unfolding on the continent mean that there are important ways in which teaching and research can respond in context-sensitive ways to the search for solutions involving rural communities (Mamdani 1993: 11–14; Mafeje 1994: 199; Ake 1994: 23; Assie-Lumumba 2006: 83; Yesufu 1973: 40).

Socially responsible learning here means that researchers do not only extract information from communities in the quest to understand them but also 'give back' on a quotidian basis by putting research at the service of local efforts to deal with local problems. But in talking about socially responsible learning, emphasis should be placed not only on the benefits to local communities but also on the better opportunities for learning for scholars. On one level this process of 'giving back' that is involved in socially responsible learning can be understood in an epistemological sense as a form of participant observation, which has been critical to ethnographic work in many disciplines in the social sciences. It can also be understood in the sense of a methodology of applied learning (Campbell, Faulkner and Pridham 2010) that gives students and faculty alike the opportunity to contextualize and better understand concepts and theories by putting them to use.

Toward Surpassing the Spectre of Impossibility

There are reasons to believe that the aspiration of sustainable rural learning economies can be realized. The contrived nature of much of the debilitating factors that render current talk of sustainable rural learning ecologies as a contradiction in terms is one reason for this. Further, the inability of colonial and postcolonial regimes to completely transform rural systems means that we can still glean undercurrents that deviate from dominant narratives about rural life, which offer bases that can be built on to realize sustainable learning ecologies.

One area in which this is evident is in the hints of openness that characterize many rural communities despite the dominant and often oppressive narrative and practice of closedness that pervades them. This is partly seen in the intense mobility that characterizes many rural zones. Crossroads like the Parrot's Beak in the Mano River Basin, Eastern DRC and neighbouring areas in Tanzania, Rwanda, Burundi and Uganda, and the western Zambia/eastern Angola area are three examples (Onoma 2013). This phenomenon has a long history that encompassed both voluntary and forced migration (Onoma 2013). In Southern Africa, the early 1800s were similarly times of great movement, whose causes are the subject of a very lively debate (Hamilton 1995). The idea of rural dwellers as settled peasants that lack an awareness of elsewhere is more often than not a fantasy.

Importantly, this movement did not only provoke the co-existence of different cultures, it often led to intense processes of incorporation, mixture and hybridization. The areas of southwestern Uganda that came to constitute the Kingdom of Ankole under British colonialism exemplify this phenomenon. While Nkore through colonial engineering came to be known as a kingdom of the Banyankore that included Bairu cultivators and Bahima pastoralists, the story was far more complex. The people known as Bairu Banyankore constitute a mixing population that incorporates cultivators from areas such as Rwanda, Burundi, Toro, Buganda, Kigezi and northwestern Tanzania. The Bahima constituted a similarly mixing population, which incorporates pastoralists from Rwanda, Burundi, Toro and northwestern Tanzania (Onoma 2013). The fact that many of the languages spoken in this zone were similar and sometimes even mutually intelligible facilitates this process of incorporation and hybridization (Bernsten 1998: 3; Chretien 2003).

The idea of rural communities as closed ones that exemplified purity has always been a figment of the imagination of those that were often intent on using these narratives to achieve political ends (Geschiere and Nyamnjoh 2000; Jeyifo 2002: 450). The uncontaminated rural bumpkin is an imaginary character that exists only in the imagination. The guile and savvy of the peasant is the subject of an extensive literature (Moyo 2002: 2; Isaacman 1990; Scott 1990; 1985).

The openness to contamination and the willingness to entertain the displacement of 'what is', which is necessary for learning, is thus not entirely absent in the history and present realities of many rural communities. Mixture and incorporation often meant exposure to and the adoption of new political, social, economic and cultural forms through process marked by contestation. A recent example of this is seen in farmers' reactions to Africa Rice Centre videos (Mele, Wanvoeke and Zossou 2010: 416–17; Elliot 2002: 197). As Brookfield notes, farmers' 'seizure of new opportunities and adaptations of livelihood practices to meet their demands have been major elements in African rural change since even before colonialism' (Brookfield 2006: 231). As has been emphasised by many scholars, the idea of tradition as the incessant repetition of cultural forms does little justice to the deliberate and open-ended (re)production of culture that occurred in many rural areas (Hobsbawm and Ranger 1992). The authors of the African Manifesto for Science, Technology and Innovation recall long histories of innovation by African communities going back over two million years (African Technology Policy Studies Network 2010: 8–9).

The emphasis on effort, process, ingenuity and contestation in the (re)production of culture is exemplified in the discourse on autochthony, strangeness, ownership and rights. It is now widely established that many communities dis-

tinguish between autochthonous lineages who are the first comers in an area and other residents who arrived later and whose rights to land and political authority are seen as inferior to those of autochthonous lineages. But as Bledsoe, Murphy and others have noted, a literal interpretation of these terms and their inscription in blood is problematic. The term 'first comer' has to be understood as a political one that results from a process of contestation. Recent arrivals in a community could through conquest and forms of suasion redefine relationships to become 'first comers' and to significantly influence cultural forms in an area (Murphy and Bledsoe 1987: 129; McGovern 2004: 236–37). The orientation towards new ideas and the willingness to question the known, which is vital to the process of learning, is thus not entirely foreign to rural areas (Simone 2008: 80). Realizing sustainable learning ecologies will thus require building on conditions that have previously characterized rural societies.

Building on this legacy of openness and learning has to be thought of as involving more than the re-capturing of the 'past glories' of rural areas to involve ways of rendering these systems better. One way of doing this is by making power and economic resources play less of a role in the evaluation of ideas and allocation of rights. The exploitative and discriminative underbelly of processes of incorporation in many rural areas has been highlighted by this author (Onoma 2013). Reducing the extent to which the chances of incorporation of new ideas and cultural forms is influenced by the power and economic clout of those proposing them will be a step towards creating space for open scholarly debate and learning. This will include reducing noxious auras of sexism, homophobia, xenophobia, religious extremism and gerontocracy that are asphyxiating thought, research and education in many spaces of learning (Aina 2010: 30, 35).

Being of the community has to have methodological implications for researchers in sustainable rural learning ecologies. It has to mean a turn towards a more interpretivist approach to research and learning understood as a way of being in the field that transforms field research and field work into a learning exercise in more ways than one. In the positivist approach to the social scientific enterprise the author first does the work of conceptualization. Concepts developed are then put to work during field research. The initiation of field research is predicated on the completion of the process of conceptualization since a primary goal of conceptualization is the direction of the choice of places where and on which research will be conducted (Goertz 2006: 159). Field research is then followed by theorization done by the researcher based on data collected.

In the positivist approach there is a neat division of labour in which the researcher does the 'higher order' work of conceptualization and theorization.

The researched perform the 'lower order' work of providing information and only do so within the parameters already set by the researcher who is similarly left with the important task of giving theoretical meaning to information provided by the researched (Onoma forthcoming).

The interpretivist approach explodes the division of labour inherent in the positivist approach by opening up conceptualization as well as theorization to the researched. By so doing it subverts the hierarchies that this division of labour entails. The researched contribute to how the researcher goes about learning about the world by contributing to the process of conceptualization. They also contribute to the process of theorization through which meaning is given to data collected from the field (Onoma forthcoming).

This implies the abandonment of temporal frames that neatly divide the three phases of conceptualization, field research and data analysis/theorization. What we end up with is an ordering where conceptualization, field research and theorization are closely interconnected and interwoven with the researcher moving back and forth between these phases. It also transforms the researched into much more than providers of data. In allowing them into the hallowed halls of conceptualization and theorization, it recognizes their capacity to contribute valuable insights into their own existence and livelihoods, contrary to assumptions that tend to encourage scholars to often ignore what peasants think in the conduct of work on them (Isaacman 1990: 17). It encourages the sort of rooting of research in researched communities and the valorization of 'traditional' knowledge and modes of knowing that the African Manifesto for Science, Technology and Innovation advocates (African Technology Policy Studies Network 2010: 18).

This approach is more in tune with the ethnographic sensibility of committing us to better 'take into account individuals' lived experiences and how they perceive…abstractions' (Schatz 2009: 10) that social scientists frequently use in their work (Schatz 2009). It better enables us to peek 'into the underlying attitudes of citizens, into the shared (but not necessarily official) meanings they assign to phenomena' (Wedeen 2009: 85). This is particularly important when one is studying marginal and disempowered rural communities. Scott (1990; 1985) has explored the ways in which such groups create and deploy 'hidden transcripts' as they seek to deal with the structures that dominate them. A key part of the struggle to survive for these groups involves fashioning alternative concepts and meanings of concepts, and in deploying ordinary terms and concepts in ways that diverge from their use by more dominant groups (Scott 1990: 1–18). These deliberately concealed and disguised concepts, meanings and uses ensure that the problem of resonance that plagues conceptualization generally is even more severe in the study of disempowered rural communities.

Conclusion: Re-imagining the Rural

Creating and perpetuating sustainable rural learning ecologies fundamentally involves re-imagining the 'rural', and by implication the 'urban' and the spaces in-between these (Simone 1998; 2004). The rural has over time been imbued with certain significations in common and scholarly parlance. These meanings represent a stumbling block to the aspiration of sustainable rural learning ecologies. The rapid transformations that African countries and their rural countryside are experiencing represent openings for reimagining the rural and broaching the creation and perpetuation of sustainable rural learning ecologies. Sustained challenges to the rural-urban dichotomy both in its spatial and cultural senses (Hugo, Champion and Lattes 2003: 280; Rosenthal 2000: 23; Lewis and Maund 1976: 17; Kemp 1990; Stewart Jr. 1958; Murray 1987), the percolation of each of these spheres by the other (Gugler 2002; Hugo, Champion and Lattes 2003: 280) and the contrived 'nature' and 'past' of what we see as rural also offer openings for interventions towards the end of creating the sustainable rural learning ecologies to come.

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Using Indigenous Games to Teach Problem-solving in Mathematics in Rural Learning Ecologies

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Abstract

This article explores the use of *morabaraba*, a board game, as an example of indigenous games to teach problem-solving in mathematics. This approach is part of a rural learning ecology informed by the theory of community cultural wealth that posits community members as experts and empowers communities to find their own solutions to local issues. It is based on the existence of knowledge which learners possess but is not used in the teaching and learning of mathematics; there is no deficiency in the marginalized knowledge of the excluded people (Yosso 2005: 79). The author tapped into the marginalized knowledge of subaltern communities to teach problem-solving using participatory action research in generating data, hence the involvement of community members (parents, traditional leaders), education experts (teachers, mathematics subject advisors, lecturers from institutions of higher learning) and learners themselves. The primary data was generated using a tape-recorder and video camera, analysed using Van Dijk's (2001) critical discourse analysis to identify instances of 'discursive injustices' in text and talk, and to acquire deeper meanings of the text. It signifies a form of resistance to unethical and unjust social power relations.

Résumé

Cet article examine l'utilisation du Morabaraba, un jeu de plateau, comme un exemple de jeux autochtones utilisés dans l'enseignement de la résolution des problèmes mathématiques. Cette approche s'inscrit dans un environnement d'apprentissage rural se basant sur la théorie de la richesse

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culturelle communautaire qui considère les membres de la communauté comme des experts et qui habilite les collectivités à trouver leurs propres solutions aux problèmes locaux. Elle est basée sur la prémisse selon laquelle les apprenants possèdent des connaissances qui ne sont pas utilisées dans l'enseignement et l'apprentissage des mathématiques; les connaissances marginalisées des personnes exclues sont utiles (Yosso 2005: 79). L'auteur a puisé dans les connaissances marginalisées des communautés subalternes pour enseigner la résolution des problèmes en utilisant la recherche-action participative dans la génération des données, d'où l'implication des membres de la communauté (parents, chefs traditionnels), des experts de l'éducation (enseignants, conseillers sur les disciplines mathématiques, conférenciers provenant d'institutions d'enseignement supérieur) et les apprenants eux-mêmes. Les données primaires ont été générées en utilisant un magnétophone et une caméra vidéo, analysées grâce à la technique d'analyse critique du discours de Van Dijk (2001) pour identifier les cas d'« injustices discursives » dans le texte et les paroles, et obtenir des sens plus profonds du texte. Cela signifie une forme de résistance aux rapports de forces sociales injustes et contraires à l'éthique.

Introduction and Background

That mathematics results in South African secondary and primary schools are poor, especially for grade 9 learners, was confirmed by the Annual National Assessment (ANA) Report (Department of Basic Education 2014: 43, 60), which showed the average performance of learners stood at 13 per cent in 2012, 14 per cent in 2013, and 11 per cent in 2014. Also, the Department of Basic Education (DBE) Reports of 2012 and 2013 illustrated that nationally grade 12 mathematics results stood at 54 and 59 per cent respectively. Moreover, Yang and Manizade (2010) have illustrated that the rote learning approach of teaching should be replaced by more application, modelling and real life problems. Mathematics should be more intuitive, interesting and accessible to a larger population of diverse learners. In this study, the teaching and learning of mathematics using the *morabaraba* (indigenous board game) helped overcome the challenges faced by learners as they realized that mathematical content was within their reach; that is, daily play contains concepts which are not viewed as too complex to comprehend. Teacher-oriented methods were influenced by an assumption that learners are empty vessels to have knowledge poured into their minds, and the lack of engagement of parents who separated teaching from the home environment and learners' backgrounds, which are actually rich in mathematical content. As Mosimege (2000: 427) and Pramling-Samuelsson (2008: 630) assert, when playing, children learn mathematical concepts more easily.

The lens

The paper is framed by community cultural wealth theory, which validates and recognizes the knowledge that learners bring from rural learning ecologies. Lynn (2004: 156) and Yosso (2002: 98,100,102; 2005: 69) argue that an array of cultural knowledge, skills, abilities and contacts possessed by socially marginalized groups often go unrecognized and unacknowledged. In this research article, *Morabaraba* is used as an example of indigenous games in teaching problem-solving skills in grade 10 mathematics classes to recognize and acknowledge the cultural practices of various communities. Van Oers (2010: 23, 26–27) introduced the cultural-historical theory of Vygotsky, which views learning as a process of qualitative change of actions that may take place when people participate in cultural activities and receive guidance for improving or appropriating actions. Within the cultural-historical context, problem-solving can be defined as an activity that emerged and underwent a rich and remarkable development to culminate in the multifaceted and highly sophisticated discipline it is today. Leonard (2008: 59, 60) contends that mathematical problem-solving, like other forms of knowledge, is situated within a cultural context; consequently, counting can be conceptually understood as both a knowledge form and a cultural practice that enables learners to organize their world. Engaging cultural norms in the classroom is at the heart of teaching cultural relevance.

Yosso (2005: 78–79) argues that community cultural wealth theory has various forms of capital, such as aspirational, navigational, social, linguistic, familial and resistant, which draw on the knowledge of learners from homes and communities being taken into the classroom. The researcher draws on the theories of Yosso and Van Oers to argue that using indigenous games to teach mathematics problem-solving skills is a way of bringing the immediate environment and experiences of the learner to the classroom.

It is evident that the teaching and learning of problem-solving should be viewed from a humanistic point of view through lived experiences of marginalized groups regarding many mathematical concepts that are formulated (Barker 2012: 20; Bush 2005: 3; Vilela 2010: 249). The use of *morabara* in the teaching and learning of mathematical content portrays the human element and human activity. Problem-solving meanings are not fixed or predetermined, and meanings are not indifferent to linguistic practices (Lynn 2004: 154; Vilela 2010: 347; Yosso 2005: 80). Therefore, the link between mathematical content and cultural practices, such as playing indigenous games, helps learners to see and appreciate the relevance of problem-solving skills in their day-to-day activities (Chikodzi and Shumirai 2010: 4).

There are many other representations and interpretations which could improve the understanding of mathematical concepts. As such, learners need to be exposed to a variety of concept representations. Maharaj et al. (2007), citing Witherspoon (1993), suggested representations to concretize mathematics, including concrete models, real-life situations, pictures and spoken language. The use of *morabaraba* is within the reach of learners and subaltern communities, and so encapsulates these representations, encouraging a learner-oriented approach by which the learners discover mathematical concepts through practical play and use of their home language, found to be rich in mathematics vocabulary (DBE 2011).

Methodology and Design

The study utilized participatory action research (PAR), which recognizes community members as authorities and specialists in their fields and is empowering for communities in enabling them to find their own solutions to local issues (Moana 2010: 10). In the context of this study, the researcher and participants were empowered in using indigenous games to solve problems and identify mathematical concepts embedded in them. Everyone had a significant role to play in the learning of problem-solving, rather than simply expecting all activities to be handled by the teachers and/or research coordinator in the team. Hitherto, marginalized cultural capital was explored to understand problem-solving by using cultural games, particularly indigenous ones.

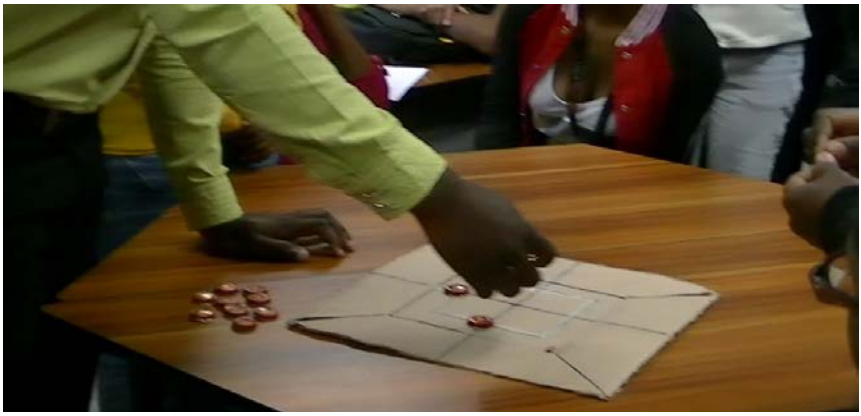
The research coordinator assembled a team of grade 10 learners in one school located in the rural area of QwaQwa, Free State Province, in Thabo Mofutsanyana Education District. This comprised one deputy principal, one head of department (HOD), three grade 10 mathematics teachers, two Life Orientation teachers, two district officials from the Department of Basic Education (DBE), one in the sports section and two mathematics subject advisors, ten parents with knowledge of various indigenous games, two members of the royal family who were custodians of cultural games, and a lecturer in the school of Mathematics, Science and Technology Education from the university.

Bungane (2014: 33) and McGregor and Murnane (2010: 423) recommend that the researcher and the participants be seen as central to the research process, and act as equals throughout the teaching and learning processes. The approach of using a board game to teach problem-solving was followed. For confidentiality and anonymity, the school and participants were given pseudonyms and, to stimulate debate, free attitude interviews (Buskens 2011: 1) were conducted, thus also ensuring that they were central to the study and their voices heard, rather than being seen as objects to be manipulated and controlled in a setting removed from the real world of their lived experiences (McGregor et al., 2008: 199; Stinson and Bullock, 2012: 46).

Findings and Discussions

According to Lynn (2004: 154) and Yosso (2002: 162), the teaching of problem-solving should draw on the strengths of learners nurtured at home. Thus the subject matter presented in mathematics class will make sense to them, with no deficit in their language, culture or lived experiences. It is important for the teachers to consider this capital wealth if the teaching and learning of problem-solving is to be simplified and meaningful. The lived experiences of learners can include storytelling, family histories and indigenous games. The DoE (2003: 2), Haylock (2010: 3) and Van de Walle et al. (2010: 13) agree that teaching of problem-solving must be learner-centred, in support of the ontological and epistemological stance of community cultural wealth theory which posits that knowledge and the nature of reality do not reside within one powerful individual, but rather that there are multiple realities shaped by a set of multiple connections that human beings have with the environment, and that the nature of knowledge is subjective (Chilisa 2012: 40). The teacher should not take centre stage, trying to explain everything for learners. As Van de Walle et al. (2010: 13) citing Schifter and Fosnot (1993) argues, no matter how lucidly and patiently teachers explain the subject matter they cannot *understand* it for their learners. If the teacher explains everything to learners their potentialities are oppressed and marginalized. The research team used indigenous games, such as *morabaraba*, to teach problem-solving in mathematics, allowing learners, teachers and parents to unearth mathematical content contained within the board game.

Figure 1: Learners playing morabaraba (board game)



As learners played they reflected on the lessons learnt in groups, reporting under various headings on mathematical concepts, skills or knowledge observed, and mentioned any information they deemed fit to share with the whole class.

> [ext] Group 1: Rona ha re shebile straturale neitjha sa morabaraba,re bona rektengele e nyane, ho latele e kgolwanyane, e kgolo, (lebella Figure 1) jwalo-jwalo. rektengele tseo di entswe ka dilaene. Ha papadi e bapalwa re bona tsena, re beha dikgomo tsa rona ka ho fapanyetsana, o lokela ho nahana ka kelo hloko pele o beha kgomo ya hao, hore o tsebe o hlola enwa wa direng. O menahana mokgwa wa ho hlola papadi ena. (As we view the structural nature of *morabaraba* we see rectangle of various sizes, the big one, the bigger one, and the biggest one (refer to Figure 1*)*. These rectangles are made out of lines. On the actual playing of the game, these are apparent; we play by giving a chance to each opponent to place his/her token cow on the board. You have to think strategically before you place the token cow on the board, so as to maximize the chances of winning the game, and also anticipate the movement that the opponent might take.) [ends]

The above extract shows that learners were able to interact freely among themselves. The teacher had given them freedom to think of problem-solving skills embedded within the board game so they were able to design a lesson plan which included those mentioned by learners. In this way, it was flexible as one plan, and accommodated the prior knowledge of learners.

The learners were empowered to decide on the content to be taught, and as such the content was infused with the context with which they were familiar. As a result, the teacher packaged the content raised by learners in the class activities to be presented; for example, patterns, which the teachers elaborated on by showing that there were ascending or descending orders in the game. In this way, learners used problem-solving skills they mentioned such as sequences (orders), rectangles, lines, and chances of winning the game that also fell within the parameters of their syllabus. The playing of *morabaraba* resuscitated concepts which they knew from their home experiences, so that as the teacher went into detail it was easier for them to relate new knowledge to what they previously knew.

As learners or teams, members interacted with the various groups to share their reflections and so demonstrated that they possessed social capital. The navigational skills were illustrated as they performed analysis and interpretations of the mathematical concepts or skills they had observed from the playing of the game. As the extract ‘we see rectangle of various sizes, the big one,

the bigger one, and the biggest one' indicates, what they conceptualized was true. They saw patterns or sequences of rectangular shapes, which differed according to size. The power of linguistic capital enabled learners to use words such as 'big', 'bigger' and 'biggest' to describe the pattern of rectangles they observed. The ability of linguistic skill helped them to understand mathematical concepts, not only ascending and descending order, but also concentric geometric patterns. These are the problem-solving skills (algebraic expressions, equations, number patterns and geometric figures) that are featured in the grades' 9 and 10 mathematics curriculum and Curriculum Assessment and Policy Statement (CAPS).

The learners used linguistic capital to describe the shapes properly, revealing how the geometric figures were arranged in a particular sequence and explaining how they were related. Mathematically, it shows that they realized that these geometric figures were ordered concentrically. The extract also shows that they were able to perform the high cognitive skills of analysing and synthesis. The teaching and learning of problem-solving has to include such skills and assess them. From the perspective of cultural wealth theory, learners already possessed these rich skills, but it is the responsibility of the teachers and community members at large to nurture and develop them further.

Consequently, the teaching of this problem-solving in mathematics had helped learners to see the relevance of the subject matter in authentic situations. All group members were actively involved in the presentation.

In order to stimulate further discussions, Mr Debako crafted worksheet 1 (see below), and distributed it to various groups.

WORKSHEET 1

1. Name all the shapes or figures shown in *morabaraba* game.
2. To justify the answer in question 1 measure (in cm) the dimensions of the above shapes and compare your response with question 1.
3. How do the shapes or figures in question 2 relate?
4. Calculate the area covered by the shapes or figures and the perimeter of the shapes.
5. What deductions can you make from question 4?

The worksheet gave learners a chance to use their background knowledge to discover mathematical content on their own. They were in small groups working on the activity, structured in such a way that they had to use various

methods to reach an answer, not only taken from the teacher or person presenting but also arrived at through class interaction.

Linda, the leader from group B, presented solutions as follows:

> [ext] Linda: we really enjoyed to work on the activity. Lots of answers came out, but finally we agreed on one solution. We will present our solutions, thereafter we can take questions and comments from the floor. Linda: Question 1, the figures are squares, but after measurement were performed in question 2, we realised that the geometric figures showed are rectangles. Remember the properties of square and rectangles. That is what we provided as our motivation, and the table below. [ends]

The table below shows how Linda's group framed their responses.

Figures	Length & Breadth	Perimeter	Area
Picture 1 above showed th big shape	1.4 cm x 1 cm	4.8 cm	1.4 cm^3
The bigger figure, following the big one	2.6 cm x 2 cm	9.2 cm	5.2 cm^3
The bigger shape, following the bigger one	4 cm x 3 cm	14 cm	12 cm^3

After the questions and comments were entertained, group D was given a chance to give feedback on questions 3 and 4.

Tshepiso, the group leader took the platform to give their responses:

> [ext] Tshepiso: Thank you group B, we really enjoyed your presentation, the excellent way you did the presentation. We hope our presentation will match yours.
> Tshepiso: (see table above), generally the breadths of big shape increase by every time. The length of the bigger figure is more than the length of the bigger rectangle. The biggest rectangle is more than the length of the biggest rectangle. Generally the pattern followed by the lengths can be described as follows: $l_n = (0,1)n^2 + (0,9)n + 0,4$ (where indicates the length of rectangles and n indicates the number of rectangles). The general pattern of perimeter and area of the rectangles can be illustrated as follows: $P_n = (0,2)n^2 + (3,8)n + 0,8$. (where P indicates the perimeter of the rectangles and n indicates the number of rectangles) and Area pattern is as follows: $A_n = (0,1)n^3 + (0,9)n^2 + (0,4)n$ (where A is the area of the rectangles and n is the number of rectangles).

The extracts above show that learners are empowered to determine mathematical concepts to be taught in class. This method of teaching problem-solving using *morabaraba* elevated learners' self-esteem and confidence. Also, their voices were respected when deciding the content to be presented in class, illustrating teaching from learners' perspectives. Also, learners are empowered to be aware that integration of problem-solving skills and concepts happens spontaneously; that is, they were aware that problem-solving in mathematics does not occur as separate entities but as linked concepts. The above activity and learners' responses showed that algebra, Euclidean geometry (shape, space and measurements) and mathematical processes (e.g., critical thinking, communication) are interconnected.

Worksheet 1 above indicates that the class activities are learner-centred, with learners having to argue before reaching the decision on the answer. This worksheet (class activity) encompasses the social capital which learners demonstrated excellently by freely sharing and networking on ideas to reach solutions. The response 'we really enjoyed to work on the activity' shows hope for a brighter future in the learning and comprehension of problem-solving in mathematics in the form of aspirational capital. Even when the learners face real and perceived barriers in problem-solving skills they are determined that they will overcome them. Using the navigational skills they helped to manoeuvre through the patterns observed in the class activity, and managed to come up with general formulae, such as , $l_n = (0{,}1)n^2 + (0{,}9)n + 0{,}4$ $l_n = (0{,}1)n^2 + (0{,}9)n + 0{,}4$ and $A_n = (0{,}1)n^3 + (0{,}9)n^2 + (0{,}4)n$ for lengths, perimeters and areas of concentric rectangles in the board game respectively.

The findings above concur with Ewing (2013: 135) in that learners recognize problem-solving skills such as patterns when they sing, dance, weave and play. Su et al. (2013: 2) add that the preliminary or background knowledge that learners possess is foundational to understanding more sophisticated problem-solving. The process of learning problem-solving skills is sustained if owned and framed by learners and school communities. Vankúš (2008: 106) points out that if learners are actively involved in the learning of problem-solving skills they tend to develop self-reliance and become more creative. This is also evident when learners managed to discover the formula for the perimeter as $P_n = (0{,}2)n^2 + (3{,}8)n + 0{,}8$, given the rectangle with dimensions and . They did not use the usual formula, $P = 2(l + b)$, used by most of the textbooks, which showed the creativity and critical thinking they had developed in learning problem-solving skills using *morabaraba*.

Conclusion

In conclusion, the argument made in this paper confirms those of the DoE (2003: 29), Provasnik et al. (2012: 1,4) and TIMSS and PIRLS International Study Centre (2009: 24) that in the teaching of problem-solving, reasoning skills such as analysing, selecting, synthesizing, generalizing and conjecturing are important attributes for learners to have, also as life-skills for survival. The empirical evidence (SACMEQ Report by Moloi and Chetty 2011: 7; Su et al. 2013: 2, 3) evinced that the wealth of marginalized knowledge learners possessed enabled them to unearth mathematical content imbued in *morabaraba* and relate them to the problem-solving skills addressed by the CAPS.

In this article, it has become evident that learners were assisted in deciding on the mathematical content to be taught in the classroom, infused within the context with which they were familiar. Engaging learners in the playing of *morabaraba* resuscitated mathematical concepts which they knew from their home experiences. Learners experienced patterns or sequences of rectangular shapes, alternative formulas of the perimeter and area of rectangle. The power of linguistic capital enabled them to use words such as 'big', 'bigger' and 'biggest' to describe the pattern of rectangles they observed. Linguistic ability helped them to understand mathematical concepts, such as ascending and descending orders, and concentric geometric patterns. Also, they were assisted in understanding mathematical concepts such as algebraic expressions, equations, number patterns and geometric figures.

Moreover, it was encouraging to realize that learners were able to discover the general pattern of the lengths of rectangles within the *morabaraba* described as*:* $l_n = (0{,}1)n^2 + (0{,}9)n + 0{,}4$ (where indicates the length of rectangles and n indicates the number of rectangles). Again, further observations were made by learners that the general pattern of perimeter and area of the rectangles can be illustrated as follows*:* $P_n = (0{,}2)n^2 + (3{,}8)n + 0{,}8$. (where P indicates the perimeter of the rectangles and n indicates the number of rectangles) and the general pattern of the Area is as follows: $A_n = (0{,}1)n^3 + (0{,}9)n^2 + (0{,}4)n$ (where A is the area of the rectangles and n is the number of rectangles*)*.

Finally, the above activity and learners' responses showed that algebra, Euclidean geometry (shape, space and measurements) and mathematical processes (e.g., critical thinking, communication) are interconnected.

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Sustainable Rural Learning Ecologies: A Pathway to Acknowledging African Knowledge Systems in the Arena of Mainstream of Knowledge Production?

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Abstract

This article proposes an idea which to most might seem misplaced and unrealistic. Its aim is to demystify myths around African scholarship and rural learning ecologies that are misrepresented in discourses dominant in the global North. Sustainable rural learning ecologies located within African-centred philosophy should be understood in this context as a transformational agenda and a vehicle for knowledge construction. The concept of sustainable rural learning ecologies is simply about acknowledging knowledge constructions within the rural contexts as knowledge embedded in African value systems. Knowledge construction in a rural learning context should be celebrated for its strengths and opportunities, as having its own comparative and competitive advantage in the global discourse arena. Sustainable rural learning ecologies (SuRLEc) should be understood as an epistemological discourse that makes meaning and critiques the dominant body of knowledge by affirming rural context and cultural constructs. The paper examines hegemonic dominant discourses that try to monopolize knowledge production systems and domesticate other parameters for the interpretation of realities as historically obsolete, irrational and pre-modern. It argues that SuRLEc is a platform that holds people's experiences as sources for the construction of forms of knowledge. I therefore argue for learning ecologies that acknowledge different formations and foundations for the construction of pyramids of knowledge. I conclude by dismissing views that hold that any one pyramid of knowledge is by its nature eminently superior to all others.

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Résumé

Cet article propose une idée qui, pour beaucoup, peut sembler déplacée et irréaliste. Son objectif est de lever les mythes autour de la recherche africaine et des environnements d'apprentissage ruraux qui sont dénaturés dans les discours dominants dans l'hémisphère Nord. Les environnements d'apprentissage ruraux durables figurant dans la philosophie centrée sur l'Afrique devraient être compris dans ce contexte comme un programme de transformation et un moyen de construction de la connaissance. Le concept d'environnements d'apprentissage ruraux durables consiste tout simplement à reconnaître les acquisitions de connaissances dans les contextes ruraux comme des connaissances intégrées dans les systèmes de valeurs africaines. L'acquisition de connaissances dans un contexte d'apprentissage rural devrait être célébrée pour ses forces et ses possibilités, comme ayant son propre avantage comparatif et compétitif sur la scène mondiale du discours. Les environnements d'apprentissage ruraux durables (SuRLEc) doivent être compris comme un discours épistémologique qui fait sens et critique le corps dominant de la connaissance en affirmant le contexte rural et les construits culturels. L'article examine les discours dominants hégémoniques qui tentent de monopoliser les systèmes de production de connaissances et de domestiquer les autres paramètres pour l'interprétation des réalités comme historiquement obsolètes, irrationnelles et prémodernes. Il fait valoir que les environnements d'apprentissage ruraux durables sont une plateforme qui utilise les expériences des individus comme sources pour l'acquisition de formes de connaissances. Je défends les environnements d'apprentissage qui reconnaissent différentes formations et fondations pour la construction des pyramides de connaissances. Je conclus en rejetant les points de vue qui soutiennent qu'une pyramide de connaissances est de par sa nature éminemment supérieure à toutes les autres.

Introduction

The starting point in making an argument for sustainable rural learning ecologies (SuRLEc) is to question the relevance of rurality as a socio-political space, and of Africanization in this century. Scholars around the globe are contesting the notion of Africanization as a socio-political discourse because of its connection with issues of ideology, power and knowledge. However, SuRLEc couched within African philosophy, should be understood as reflecting the dynamic and fluid lived experiences of African people subjected to conditions of neo-colonization and neo-apartheid. Africanization is about repositioning our knowledge constructions in curricula from the historical past and deciding on the shape and form of our own destinies.

In setting the stage for Africanization and SuRLEc I will use anecdotes about African people in rural settings who are becoming themselves by ac-

knowledging their worth and their African value systems. For example, if there were no apple trees where Sir Isaac Newton lived, where and when would the laws of gravity have been discovered? When one drives a Mercedes Benz, or a Bavaria Motor Works (BMW), one identifies with the best of German engineering. These anecdotes about Isaac Newton and German engineering accomplishments point to the fundamental of origins and roots of knowledge construction, its meaning and context, its relevance, its interactiveness, its use and its culture-relatedness. It is significant that knowledge has roots where it originates and moves from the local to the global (Makgoba 2005).

I argue that Africanization and SuRLEc are all about showing respect for and acceptance of African cultures and value systems. My understanding is that any form of knowledge has its foundation on the experiences of people informed by their own sociological and cultural constructs. Africans are faced with numerous challenges, not only to transform their social status, but to seek revival, rebirth and renewal to signal their identity as people. It is necessary to scrutinize African cultural identity as it is understood in the article. I am mindful of the fact that there are numerous other positions on the definition of African cultural identity. In this discussion, African cultural identity may be and is a social construct. The dominant ideologies crystallized in colonialism and apartheid have attempted to define African identity and how knowledge is constructed. I am mindful of the multiplicity of other definitions; Africanization remains a contested terrain that can never be neutral. The concept has been the subject of many disciplines, ranging from anthropology, sociology, cultural studies and political science to history and beyond. Meanings are as many as there are theorists and discourses around the notion of Africanization (Mahlomaholo 1998: 81).

SuRLEc located within Africanization cannot be theorized out of existence; it is important to understand that these ecologies are a position in discursive spaces and practices. The dominant ideologies have defined and theorized Africanization as a static concept to the extent that African people could be described as primitive. I wish to demystify these myths by arguing that knowledge construction located within African cultural values is a multiple dynamic and fluid process that involves lived experiences of Africans. African knowledge construction refers to discourses that Africans share with the globe, both within and outside their cultural milieu. Africans, irrespective of where they come from, position themselves in terms of geopolitical spaces (for example a rural setting) in counter-hegemonic discourses. This will give a different meaning and understanding to what it means to be an African in a rural setting. The onus is on Africans in those socio-political spaces to radically position themselves as equal partners in knowledge construction on the global stage.

Dominant discourses have monopolized the parameters for interpreting realities. These dominant ideologies have continued to teach Africans that everything African is pitiful, despicable and embarrassing and should be subjected to cleansing with global Northern or Western tools (Odora-Hoppers 2002). This is evident in South African rural settings, where knowledge constructed by people from these socio-political settings is subjugated or pushed to the periphery in the advancement of global dominant ideologies. To counter this neo-colonial mentality, it is relevant and important to acknowledge and respect SuRLEc located within Africanization, because knowledge is relative to culture and context. If we acknowledge rural learning ecologies, we will overcome the penalties of the colonial master that valorize and amplify the dominant ideologies, with little faith and pride in African achievements, heritage and cultural dynamics.

Theoretical Frameworks Adopted

This discussion is underpinned by an eclectic mix of theoretical frameworks. A hybrid of theoretical frameworks was chosen, motivated by the power and possibilities of challenging dominant ideologies of meritocracy and macro- and micro-aggression. This piece wants to disrupt, dismantle and trouble the complex struggles of ideological beliefs rooted in Western/Eurocentric/global Northern epistemologies. Eurocentric epistemological dominance seems to militate for the maintenance of superiority through the production of knowledge and disregard of 'other' epistemological stances.

This paper is informed by the assets-based approach, critical theory, critical emancipatory research and critical race theory. The aim of adopting this eclectic mix is to trouble Eurocentric epistemological perspectives that have been dominant ideologies in the arena of knowledge production rooted in white superiority that subjugates, devalues, delegitimizes and marginalizes others forms of knowledge construction. These theoretical frameworks share a counter-hegemonic stance that disrupts the mainstream and brings social justice, hope, democracy, emancipation and equity to 'other' forms of knowing. Common features of these theoretical frameworks are validation of the marginalized, emancipation of the devalued, amplification of the voices of the voiceless, and empowerment of the disempowered. The shared golden threads in these frameworks are aligned to and focused on the subject matter (see Delgado Bernal and Villalpando 2002; Huber 2009; Mahlomaholo and Nkoane 2002; Nkoane 2012).

Principles for Positioning Sustainable Rural Learning Ecologies

For SuRLEc to be firmly grounded within Africanization it should respond to the following principles that are informed by African cultural values, namely equity, social justice, peace, freedom and hope. Equity forms the foundation of pyramids of knowledge; equity in this piece of work is understood as the disruption and dismantling of dominant hegemonic ideologies. Every society works to reproduce itself within its cultural order and the structure of practices and meanings around which that society takes shape. Cultural values are relayed through various features, and those values are registered to a larger societal structure and way of life. Antonio Gramsci's theories in the early 1970s amplified the necessity of disrupting the hegemony and domination of the thinking, the life-ways and everyday subjugation of the marginalized (Gitlin 1979). Equity becomes a revolutionary strategy to counter hegemonic discourse. Adorno (1974) and Horkheimer and Adorno (1972) also argued forcefully for dismantling and disrupting the dominance of hegemonic ideologies.

I further wish to argue and contribute to the disruption of narrowly defined process of knowledge construction, predominantly informed by Eurocentric epistemologies and dominant ideologies that seem to subjugate other forms of knowledge construction. Authors such as Huber (2009), and Delgado Bernal and Villalpando (2002) refer to the apartheid of knowledge in academia, which is sustained by an epistemological subjugation that limits the range of other possible epistemologies within the mainstream. Dominant ideologies portray other ways of knowing and knowledge construction as deficient and non-rigorous. For unknown political reasons of dominance in knowledge construction, some forms of knowing have been devalued, delegitimized and marginalized. Knowledge construction has been used as a tool and practice of 'othering' knowledge constructed outside the global North.

Equity, as a revolutionary strategy to counter hegemonic dominance of knowing and knowledge construction, could be equated to the understanding of how issues of power are tied to the legitimacy of knowledge. Huber (2009) asserts that knowledge as a discourse of power decides what is considered truth or scientific, and this is tied to the power to legitimate and de-legitimate whether something is scientific or not. Dominant ideologies have used cultural deficit models to denigrate, marginalize and subjugate other forms of knowing as unscientific.

The second principle that should inform SuRLEc is social justice; this principle contests issues of power relations and prejudices about who are the custodians of 'legitimate' or scientific knowledge. Social justice in this article is constructed as a way to disturb tensions of power relations present in educational practice. I am using Foucault's theorization that challenges

hegemonic dominance in knowledge construction and practices. Foucault advocates social justice that acknowledges other forms of knowing, and societal values and cultural structures that move towards equity instead of marginalization (Foucault 1997). The starting point of social justice, according to Foucault, is to challenge power wielded by the strong over the weak. For SuRLEc, responding to the principle of social justice should be seen as a countering of dominant power relations by enabling the individual telling of stories, and thereby allowing people in different geo-socio-political spaces who are usually assumed to be without 'legitimate' scientific stories to be at the centre rather than on the periphery.

The third principle for SuRLEc is peace, by challenging the marginalization and disrespect inherent in claims that certain forms of knowledge are superior to others. The dominant hegemonic ideologies have monopolized the parameters of the interpretation of realities. Western and Eurocentric dominance in Africa, due to various colonial footprints, has managed to maintain dominance over colonized African people. African people were intellectually, socially, economically and politically marginalized from the centre of knowledge production (see Kallaway 2002; Mahlomaholo 1998; Nkomo 1992). Amilcar Cabral (1979: 53) asserted that:

> [ext] foreign domination, whether imperialist or not, would choose to liquidate the population of the dominated, eliminating possibilities of their existence; or…impose itself to the culture of the dominated. [ends]

The subjugation of African culture and ways of knowing is common due to colonization and imperialism, which have caused disturbances in the thoughts, emotions and way of life for those who experience such systems. What we need to ask is what Africans could offer to the people of Africa, to the world and the global corpus of knowledge, just as the dominant discourse has engaged and left footprints on the world of knowledge (see Nkoane and Lavia 2012; Makgoba 2005).

The fourth principle is total emancipation, which is critical for SuRLEc to position itself in the centre and move from the periphery. Africans must address social ills, ignorance, distorted consciousness and constraints of ideology. Total emancipation in this piece is understood as African consciousness, from which it derives and celebrates its strengths and opportunities to its own comparative and competitive advantage in the global arena. Irrespective of the socio-political spaces, Africans must draw their inspiration from their environments, as an indigenous plant growing from a seed that is planted and nurtured in African soil (see Makgoba 2005; Nkoane 2012).

The last principle that needs to drive and motivate SuRLEc within Africanization is that of hope; it should be a driving force to Africans and the world. Africans should not be copying from foreign dominant ideologies but should be driven by a hope that informs the natural intellectual growth of African social and political habits. Irrespective of their social stations, Africans should not have a feeling of helplessness that seeks validation from dominant hegemonic forces. Validation of their own knowledge construction should generate the knowledge that would contribute to improving the life and work of ordinary Africans in different socio-political spaces. SuRLEc should contribute to the socio-economic and intellectual emancipation of the total human race. Africans themselves must engage with and reflect on their own meaning-making for African knowledge construction to be validated as relevant and responsive.

Knowledge Construction as a Contested Terrain

Knowledge is created in discourses, in the narrow or intervening spaces of relational conversation and lived experiences. For me, knowledge is about imagination and imagining; it is always coloured by perspectives, whether they are African, rural, European or American. Because knowledge is constructed in the regime of truth, it is not one thing only, but an ever-evolving complexity, which is never finite. For sustainable rural learning ecologies to prosper, African knowledge construction must position itself on an increasingly shrinking global stage.

Foucault (2004) avers that knowledge is mere invention, a result of interactions between impulses, desires, instincts and fear. Knowledge is always a fragile compromise, produced in the narrow, intervening clashes of conflicts, interests and instincts. Foucault further argues that knowledge is the outcome of a battle and functions as a strategic relation between living beings. He points out that truth and power are interlinked; they maintain each other, resulting in a specific 'regime of truth' that differs from society to society. This regime of truth defines which discourses are allowed and accepted as true, and provides the mechanism to distinguish between 'right' and 'wrong'.

Hegemonic dominance in the circles of knowledge construction is a political battle in which the discursive weapons of knowledge and power are used and which determine the formation of a context-specific truth. The battle and dominance is about the truth itself rather than the status of being accepted as truth with all its economic and political implications. As a counter-hegemonic strategy, Africans in rural settings should position themselves as equal partners in the corpus of global knowledge. Foucault (1976; 1979; 1988) has described the origins of various systems of ideas developing into scientific disciplines. He reiterates that a specific way of thinking is established on the basis of discovery or construction of an object.

Knowledge is Culture- and Context-relative

Throughout history, dominant ideologies have tried to monopolize the parameters of interpreting realities. Hegemonically dominant discourses continue to teach people that everything rural and African is pitiful, despicable and embarrassing and should be subjected to cleansing with Eurocentric or urban foreign tools (see Makgoba 2005; Mekoa 2006; Nkoane 2006; 2012; Odora-Hoppers 2002).

The use of anecdotes about Isaac Newton's law of gravity and the Mercedes and BMW as a reminder of German engineering in the introduction of this article speak to several fundamentals of knowledge: its meaning, its context, its relevance, its interactiveness, its use and its culture-relatedness. I demonstrated that knowledge always originates and moves from the local to the global. The recognition and signatures of knowledge are all blueprinted in its origins. Knowledge helps us understand more fully the past, the present and the future of our existence, our origins and our destiny.

In order to promote SuRLEc within the philosophical underpinning of Africanization, we should revisit our way of conceptualization about how we theorize and how we do research. SuRLEc should avoid imitation of the dominant discourse. Promoting SuRLEc within Africanization philosophy is about the grounds of a corpus of knowledge, about epistemology, about the objects of our intellectual aspiration. These two concepts (Africanization and SuRLEc) entail an interrogation of curricula and their relevance and appropriateness in responding to African objectives and demands (see Makgoba 1998; Mekoa 2006; Nkoane 2006).

What does Africanization of Knowledge Construction Mean to Me?

According to Asante (1997), Africanization is the orientation of the mind which aims at constructing an African consciousness that valorizes political strength, meaningful identity and the power to transform the social and economic circumstances of Africans and the world. In this article, Africanization is understood as a counter-hegemonic discourse, which interrogates epistemological considerations that are dominant in cultural identities. At an epistemological level, Africanization as discourse attempts to make meaning and critique the dominant body of knowledge by affirming an African cultural construct.

A worldview shaped by Africanization may lead to empowerment and emancipation, because it connects Africans to their historical traditions, and to a sense of community. According to Seepe (1998), Africanization is the view that the African experience in its totality is the foundation and sources of the construction of forms of knowledge. It means Africans must be the primary and principal communicators of African experience. It disclaims the

view that any pyramid of knowledge is in its very nature eminently superior to all others. Makgoba (1998) asserts that Africanization is a vehicle for defining, interpreting, promoting and transmitting African thought, philosophy, identity and culture. He sees Africanization as a mind-shift from a European to an African paradigm. Africanization involves incorporating and adapting other cultures into and through African visions and interpretations to provide the fluidity and dynamism that is important for the success of African people in the global arena. Africanization is non-racial.

Achebe (1997) spoke about African identity as an identity in the making. There is no final identity that is African. However, at the same time, there is an identity coming into existence and it has a certain context and meaning in which Africa signifies something to some people (see Makgoba 2005; Nkoane 2006). Africanness in this article is defined as dynamic and vibrant and not as fixed or static. Africanness implies a positioning in discursive spaces, and practices of power and knowledge relations that are dynamic and fluid. Mahlomaholo (2004) says Africanness is not about anatomy or geography, because these were nothing but *markers* that people used to single out others for oppression, exclusion and marginalization. Africanness exists more as an orientation of the mind than in reality. These markers were used to justify marginalization, exploitation, exclusion and social degradation, and they used negatively charged cultural constructions to achieve a particular goal.

To use this concept as a counter-discursive strategy, Africanness similarly refers to a position from which peoples can assert themselves. Such positions, because of the history and experiences that people have had (and still have), cannot be denied, because to some extent they have come to define who those people are. They are important positions from which people's basic human rights, privileges and interests can (and should) be argued, advocated and struggled for (Mahlomaholo 1998; Nkoane 2006).

Positioning African Rural Learning Ecologies in Narrow Spaces of Discourses

For me, SuRLEc means knowledge grounded in African communities and cultures. SuRLEc has to draw its inspiration from its environment, as an indigenous tree growing from a seed that is planted and nurtured in African soil. It needs to be useful to Africans and the world and should pursue knowledge constructions that contribute to the transformation of socio-economic and intellectual emancipation of the total human race. I see SuRLEc as an African knowledge system that is emancipatory, responsive, relevant and able reflect the identity of its people.

I am mindful of the realities referred to by Derrida (1995) as sameness which is not identical. Achebe (1997) describes diversity 'not as an abnormality, but as the reality of our planet'. Meaning that the nurturing of diverse cultures, ideas, perspectives, interpretations and worldviews are what enable the construction of knowing to reflect and relate to its society. Said (1996) tells us that our main weapons in the struggle for openness and tolerance are today not military but moral. He reminds us that the struggle against colonization and apartheid was clear about its goals and methods, and the liberation and democratic movements were clear in their purpose of social justice, inclusion and coexistence, as opposed to marginalization and exclusion.

Makgoba (2005) reminds us that for human beings to be totally emancipated we should not be trapped in the stale dichotomies of North and South, developed and developing, traditional and modern, urban and rural. The human race, irrespective of their social stations (i.e. geo-socio-political spaces) should become part of new dialogues and play a pivotal role in determining the national and global scientific agenda in the corpus of knowledge. Africans should also find the courage to claim place and space as trendsetters on the global stage.

Conclusion

In conclusion, I argue that Africans should move towards identification, integration and engagement with African society and its realities, whether with languages and arts, music, culture, or worldview and ethics. Africans in pursuit of knowledge construction have the competitive and comparative advantage to preserve and develop rich African knowledge systems and heritage into the future. This could be achieved through differentiated forms of partnership at societal, regional, provincial and continental levels. These could be a set of interdependent, multi-dimensional interacting spheres on a geographical, socio-political, socio-cultural and economic basis. SuRLEc should entrench diversity and promote transformation. This should be informed by social justice, equity, hope, democracy and peace as the foundational principles to enable Africans to pursue their scholarship and acknowledge diverse foundations of pyramids of knowledge.

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Exploring Strategies to Strengthen Continuing Professional Development of Teachers in Rural South Africa

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Abstract

Professional development of teachers is a cornerstone of the provision of quality of teaching and learning in a country's education system, affirmed by the literature, with programmes central to proposals for improving the quality of teaching and transforming education. Competencies of teachers in South Africa have not improved as envisaged, according to studies conducted, with many professional development programmes not yet implemented or not taking into account teachers' perspectives. In addressing this challenge, the aim of this article is to determine components of a strategy that could be employed to implement professional development programmes, drawing on a project conducted in two rural secondary schools in the Free State province. Data were generated from school community participants and district-based officials using a Participatory Action Research approach. Findings revealed six distinct components of a strategy, namely establishment of a team comprising all stakeholders; the creation of a common vision for all based on a thorough Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis; prioritizing items; drawing up of a strategic plan; monitoring procedures to determine progress made; and suggesting possible ways of improving on weaknesses.

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Résumé

Comme indiqué dans la littérature des sciences de l'éducation, le développement professionnel des enseignants est la pierre angulaire de l'offre d'un enseignement/apprentissage de qualité dans le système éducatif de chaque pays, avec notamment des programmes adaptés aux propositions visant à améliorer la qualité de l'enseignement et à réformer l'éducation. Selon certaines études, les compétences des enseignants en Afrique du Sud ne se sont pas améliorées comme escompté, étant donné que de nombreux programmes de développement professionnel ne sont pas encore mis en œuvre ou ne tiennent pas compte des points de vue des enseignants. En vue de relever ce défi, le présent article se fixe comme objectif de déterminer les composantes d'une stratégie qui pourrait être utilisée pour mettre en œuvre des programmes de développement professionnel, en s'appuyant sur un projet mené dans deux écoles secondaires rurales de la province de Free State. Les données ont été générées par les participants de la communauté scolaire et des fonctionnaires basés dans les districts, en utilisant une approche participative.de recherche-action. Les résultats ont révélé six éléments distincts d'une stratégie, à savoir la mise en place d'une équipe comprenant toutes les parties prenantes; la création d'une vision commune pour tous basée sur une analyse approfondie des forces, faiblesses, opportunités et menaces (SWOT); la priorisation des items; l'élaboration d'un plan stratégique; les procédures de suivi pour déterminer les progrès réalisés; et la suggestion des moyens d'améliorer les faiblesses.

Introductory Background

This article aims to determine components of a strategy that could be employed to effectively implement programmes for professional development, a cornerstone of educational reform and pedagogical improvement practices of teachers. Murtaza (2010: 217) defines professional development (PD) as the sum of all continuing activities, formal and informal, carried out by individuals or systems to promote staff growth and renewal. The PD of teachers is a continuous process, described by Barnes and Verwey (2008: 10) in terms of continuing professional development (CPD) programmes for teachers that follow pre-service education and the induction phase.

A number of initiatives have been introduced by the Department of Basic Education (DBE) to improve the competencies of teachers in classes in South Africa. One aspect which has influenced the failure of the CPD programmes for teachers has been the non-involvement of practitioners when programmes are designed. Ono and Ferreira (2010) confirm that teachers have been excluded in the design of programmes and policies for PD that are expert-based with the knowledge and experiences of teachers not being considered. Teachers

become absorbers of knowledge transmitted to them in a top-down approach presented in a rigid way, without room for context or for teachers to construct knowledge based on their experiences. It thus becomes difficult for them to translate and contextualize the CPD programme into the classroom, particularly in rural schools with their own characteristics. Designed from a uniform perspective (Myende 2014: 4), Ono and Ferreira (2010), Papastamatis et al. (2009: 84) and Villegas-Reimers (2003: 24) argue that any education reform or improvement that fails to consult teachers in their CPD programmes has not been successful. The balance between experts' knowledge and teachers' experiences has to be forged. Sacrificing either is detrimental to any form of teacher development (Villegas-Reimers 2003: 24).

For schools in rural areas a number of initiatives have been put in place by the DBE to attract teachers. For example, the Fundza Bursary Scheme, by which prospective teachers are given a bursary for a number of years to complete a full teaching qualification, upon receipt of which they are expected to make available their services to a provincial education department for the same number of years (Bennel 2004). The recipients are placed in different areas, including in rural areas, where there is a shortage of teachers. However, the same teachers who are placed in rural areas are often attracted by opportunities in urban areas, leaving behind teachers who in most cases are not specialists in their subjects (Nelson Mandela Foundation 2005) but who regard themselves as 'caretakers', often spending longer than anticipated in the post.

A further challenge for teachers in rural areas is the lack of teaching and learning aids (McKinney 2005), particularly for those who teach Natural and Physical Sciences as these require experiments to enhance understanding; but an absence of teaching and learning aids impairs the competencies of teachers (Kanyane 2008: 88). The challenge becomes how and where to access appropriate professional development programmes that will enable them to improve in their teaching. Many researchers have noted that while professional development had been provided it was not always relevant to the realities of the classrooms of teachers in rural areas (Ball and Cohen 1999; Ono and Ferreira 2010; Villegas-Reimers 2003), most of which were previously disadvantaged communities, presenting yet more challenges, such as transportation to and from the in-service training centres and lack of relief educators (Stack et al. 2011: 3).

Bantwini (2009: 173) challenges the cascading model of presenting CPD programmes for teachers as it regards them as passive recipients of the designed programmes and consumers of knowledge produced elsewhere. The national DBE trains the provincial DBE officials, who in turn will train in the districts, then cluster teachers and train them. The assumption in this CPD programme's

approach is that teachers can change their behaviour and learn to replicate it in their classrooms (Shangase 2013: 28–29), but this does not always work. Understanding of the process is pivotal because in formal education access to the learner's mind begins with the teacher (Mahlomaholo 2012: 4). An exclusively top-down approach will not always work.

Another challenge to the implementation of the CPD programmes has been a lack of leadership to ensure that they are relevant at school level. Biputh and McKenna (2010: 289) found that teachers had observed a lack of opportunities for improvement on the basis of Integrated Quality Management System (IQMS) professional development needs. Administrators were rarely prepared to offer useful advice or provide an opportunity for learning. The study further revealed that the leadership did not create a space in which discussions on a one-to-one basis would take place. Teachers did not have a chance to sit down with their Development Support Groups (DSGs) or Staff Development Team (SDTs) and no time was created for working on the issues raised in their personal growth plans (PGPs). Teachers submitted all of their documentation and went through the rule book scrupulously, but with no follow up. Principals were able to settle scores with teachers rather than attending to the teachers' professional development (Kutame 2010: 97). Besides school principals, districts are also mandated to look at the immediate PD needs of teachers. According to the IQMS policy document 'The district/local office has the overall responsibility of advocating, training and proper implementation of the IQMS [and] the district/local office has a responsibility with regard to the development and arrangement of professional development programmes in accordance with identified needs of educators and its own improvement plan' (DoE 2003: 5).

However, an earlier study by Tsotetsi and Mahlomaholo (2013: 95) showed a lack of support from the district office, and that when teachers sent their requests they expected assistance. If schools themselves requested assistance from the district offices the response was often negative and rude (Nelson Mandela Foundation 2005: 129). Hlongwane (2009: 166) found lack of support from the district office, not only in terms of infrastructural requirements but also in content and pedagogical practices, corroborating the Nelson Mandela Foundation findings. School Management Governance Developers (SMGDs) and learning facilitators (LFs) normally come thrice a year per school; but their attendance is normally not to support or back up teachers but rather for administration and the policing of schools (Nelson Mandela Foundation 2005: 129).

Critical Emancipatory Research as the Theoretical Framework

For our paper we opted for the use of Critical Emancipatory Research (CER), a transformative lens which originated from the Frankfurt school in response to unsatisfactory conditions it wished to change (Jessop 2012: 1–2), and which allowed researchers to hear the voices of the oppressed groups and interpret them. We used CER to see how CPD could be better implemented. Using CER as a transformative lens we neutralized the power we possessed as researchers, thus becoming co-learners occupying the same status as the participants and partners in knowledge generation. Meanwhile, CER gives power to the participants in enabling them to tell and write their stories, validating and respecting their knowledge rather than considering it as 'weak knowledge' (Netshandama and Mahlomaholo 2010: 114). Co-learning and co-creation of knowledge become key experiences when CER guides the process (Nkoane 2012: 98), providing at least two ways in which a problem can be identified. Firstly, the passive, marginalized group identifies the problem; secondly, the researcher can identify the problem then approach the participants for the co-creation of a solution. In both cases, CER advocates co-creation of a solution.

Research Methodology

The methodology chosen for the paper was Participatory Action Research (PAR), based on ways of knowing that go beyond orthodox empirical and rational Western epistemology (Reason 2006: 195). We opted for PAR as it would operationalize CER, the theoretical framework guiding the initiative; knowledge is not extracted or 'mined' from the rural community to be used by scholars to advance their agendas and or make their fortunes (Ehrhart 2012; Kemmis 2006: 461). In essence, PAR puts CER into practice. PAR generates local useful information and records it in an accessible form. Both the professionals and the erstwhile informants, the partners, occupy the same status (Kemmis 2006: 471), becoming co-learners. PAR offers the possibility for all parties to learn through practice, with the process an end in itself (Joyner 2002). The latter stance of PAR is similar to that of CER towards the researcher and partners in research.

PAR generates knowledge enriched by the diverse perspectives of participants (Kemmis 2006: 461), creating space for participants' educational empowerment to change their lives. Consequently, the knowledge created is understood and owned by the people from whom it is derived (Ehrhart 2012; Kemmis 2006: 463). Compared to conventional methodologies, participants are more open to give richer and more reliable information because they view PAR's approach as committed to improving their lives (Kemmis 2006: 469), with trust between the researcher and participants. PAR's approach is not

about extracting knowledge to be exported for processing, sale and consumption in other First World countries (Ehrhart 2012); rather it is about changing people's lives. In conventional research, the researchers are considered to be inert, observers of their subjects, whereas in PAR they are part of the process, engaged agents who learn about their environment initially through practical experience rather than detached contemplation (Gibbon 2010). On the other hand, participants become the agents rather than the objects of research, determining and meeting their own needs (Ehrhart 2012).

Eberson, Eloff and Ferreira (2007: 131) and Eruera (2010: 3 of 9) found that the problem can be identified by either the community or the researcher, and if identified by the former it can pass to the latter for his or her expertise in assisting in solving it. The reverse is also true, as in our project, when we identified a problem regarding the professional development of teachers and went to the principals of the two schools with a possible solution. Both were interested in being involved and we agreed to have a follow-up meeting at Kgotso Secondary School (a pseudonym), in which both deputy principals would also be available.

The meeting between the principals, deputy principals and us took place in July 2011, and we agreed to have a team to lead the process and continue to seek the involvement of other partners. We agreed that the deputy principals would speak with the School Governing Body (SGB) and teacher unions, while the principals would lead meetings with teachers, SMGDs, LFs and IQMS coordinators. The other suggestion was to have delegates or representatives from these partners if their involvement was successful. In our capacity as researchers, entering the community to conduct research and gain confidence in the participants was not an easy task (Eruera 2010: 2; Strydom 2002: 427). It was to our advantage that we had several years of experience as teachers, and it was only a few years since we had resigned as practitioners. Our previous interactions made it easier for us to gain confidence and cooperation. Secondly, the principal at Kgotso Secondary School was a Master's student at the University in the same year in which we conducted the research. The same was true of the Nala Secondary School (a pseudonym) SMGD, making it easy for us to gain access to and trust in the two schools.

Data were generated and recorded, including the discussions on the voice recorder, and transcribed verbatim. They were then reviewed through intensive reading of the transcripts to identify the main themes, and code them. Some of the information from teachers was also relevant to the introductory part of the paper while other information was not. We presented relevant data as findings and used critical discourse analysis to analyse the data. In the process we were able to draw a concluding summary.

The Components and Aspects of a Strategy Used in Response to Challenges

In the introductory section, challenges to the implementation of programmes and policies were highlighted. In this section the focus is on how they were attended to. The strategy used consisted of six components as follows.

Team Formed as Part of the Strategy

Both principals had an interest in our initiative and requested that we set another meeting, which their deputies would also attend, in July 2011. In the meeting of six people, one of the deputy principals said: 'We need to form a team to lead the process', which showed how problems were being tackled in the community. A team is normally dedicated to the task of finding ways of solving problems while reporting back to its constituencies. This is a representative democratic process in which a larger group is represented by certain individuals. Also implied is that it would not be a good idea for only six of us to tackle the challenge. It was on the basis of the above suggestion that a discussion was held on the composition of the team, agreed as including SGBs, district-based officials, teachers, and teacher unions. The deputy principals were allocated the duty of informing and finding representatives from the SGBs and teacher unions while principals were to inform and find representatives from their teachers, SMGDs, LFs and the IQMS coordinators. Having informed the various partners an agreement was reached that a delegate from each of the groups be elected to represent that particular group in the team driving the professional development of teachers. For all the democratically elected delegates the meeting was then scheduled for 29 July 2011.

The first meeting of the team was dedicated to driving the implementation of the CPD programmes, with two SMT members from each of the schools, two teachers from each of the schools, two parents from each of the SGBs of the two schools, two LFs, two SMGDs, four teacher union members and two IQMS coordinators from the district. It was therefore agreed that those representatives from various structures would form the team driving the CPD programme's implementation. In total there were twenty-two members representing both schools. The purpose of including as many of the partners as possible was to democratize the committee and have multiple perspectives (Jessop 2012: 2), as advocated by CER.

The venues would alternate, but to accommodate the district-based officials it was agreed that meetings would be held at the same time and venue. It was on the basis of the composition of the team that an agreement was reached to hold the two secondary schools' meetings at the same time, convenient in that the distance between the two was only about five kilometres. The functions

of the team dedicated to drive the implementation of the CPD programmes were to look at the identified needs of the school and ways to address them.

The literature (Moloi 2010: 158; Monyatsi 2006: 152; RSA and DoE 2003: 2; Steyn 2011: 225) supports the establishment of a committee to drive staff development programmes. Particularly distinct about the team was that parents, district-based officials and union members were included in driving the process at school level.

Establishing a Common Vision

As indicated in the preceding section, the first meeting of the team was in July 2011. Having agreed with the two deputy principals two weeks before, one of the IQMS coordinators was requested to take the team through the process of the IQMS whilst the other IQMS coordinator was tasked with taking the team through the 'Integrated Strategic Planning Framework for Teacher Education and Development in South Africa, 2011–2025', commonly called 'the Plan'. The emphasis of the IQMS coordinator was on identification of the professional developmental needs of schools serving as the point of departure; however, he warned that schools needed to realize that the DBE might, in addition to the schools' needs, have its own. He advocated and trained attendees on the process and procedures of the IQMS, finally taking the team through the structures for the IQMS implementation process.

The next IQMS coordinator took the dedicated team through implementation of the CPD programmes, the primary goal of which was to improve the quality of teacher education and development, and so improve the quality of teachers and teaching (RSA, DBE and DHET 2011: 1). She guided them on outcomes and outputs of the Plan, and the enabling factors for its implementation (RSA, DBE and DHET 2011), a lengthy process being followed by the facilitator dividing the team into five groups to brainstorm and arrive at a vision that would be guiding them throughout. A further agreement was that the suggested vision would be returned to the other partners for endorsement. Having discussed and written their visions on the charts, a process of consolidating the visions into a single one followed. Group members returned to their groups and tried to form one vision from the five groups. As the groups returned the final adopted vision was 'continuous, quality CPD programmes for quality teachers'. This was then returned to teachers, the SGB, teacher unions at the respective schools and all partners involved. With the different suggestions from partners an agreement was made that the team driving the CPD programme would consolidate the various suggestions. From these, one single vision that would guide the two schools was concluded. While the two schools would be sharing the CPD programme's vision it was also agreed that

each would maintain its autonomy as a school. The final vision then read as 'Continuous, quality CPD programmes for quality schools'.

Unlike in other situations, where a less consultative process takes place in formulating the CPD programmes' visions, the above, although a lengthy process, was more democratic and therefore bound a number of partners in education to ensure that the vision was received by teachers. Steyn (2011: 222) supports the idea of having a common idea as an initiative that binds together efforts in order to achieve a common goal. On the other hand, Ramatlapana (2009: 157) showed that without a common vision an organisation will achieve less.

Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis

For the purpose of the SWOT analysis, the two schools had to be separated; each looked at its own strength, weaknesses, opportunities and threats. Kgotso Secondary School had the following *strengths* in terms of the implementation of the CPD programmes: the principal knew that the planning, organizing, leading and control were his most vital roles and responsibilities as the person with the Master's degree. CPD programmes were held in which teachers would discuss learners with problems. The discussion culminated in a programme called 'adopt-a-learner', in which learners with problems would identify teachers they thought would assist them with their problems and share them with those teachers. Meetings between teachers and learners were held from Mondays to Wednesdays, and on Thursdays teachers would converge and discuss their successes and challenges. That was confirmed by the following teacher's words: 'During our meetings we sit down and advise one another.' The programme acted as a strong point in this school as teachers could advise one another and share ways of dealing with children's matters.

On the other hand, Nala Secondary School had the following *strengths* in terms of the implementation of the CPD programmes: the management continuously held workshops in which it was motivating staff members as a way of boosting their morale so they worked harder. Workshops were held in which departments had to set plans for the upcoming year or term and motivate staff members to set high standards of achievements in their classes. Both schools had strengths of caring for learners and motivating staff.

In terms of *opportunities* in the implementation of the CPD programmes, Kgotso Secondary School had the following: their good relationship with the University and the presence of a willing NGO to assist SMTs, Mathematics, Physical Sciences and Accounting teachers and learners. In addition to Kgotso Secondary School's *opportunities*, Nala Secondary School had the following in terms of the implementation of the CPD programmes: the supportive SMGD

who would be with the school and hold development programmes at least once per annum, and the presence of an NGO which was willing to support the SMT, Mathematics, Physical Science and Accounting teachers and learners. Both schools had the same NGO willing to assist teachers and learners in the three aforementioned content subjects.

Kgotso Secondary School had the following *weaknesses* in terms of the implementation of the CPD programmes: a lack of parental support in the CPD programmes; no pre-evaluation sessions were held before getting to classes as required by the IQMS policy document; there were no team-building workshops to keep the staff members and the SMT working together; a lack of workshops in which labour matters could be discussed; a lack of workshops in which teachers with disciplinary matters with learners could be enlightened; a lack of development programmes in which teachers might share good practices; a lack of programmes to develop SMTs to do their work; a lack of induction of novice teachers; a lack of time to discuss subject related matters; and a lack of a uniform way of ensuring that teachers who had attended workshops could be given support.

On the other hand, Nala Secondary School had the following *weaknesses*: lack of curriculum management control by the SMT, including a lack of follow-up, lack of team building programmes, which resulted in unhealthy working relations, lack of motivation programmes that would act against negative attitudes amongst staff members, and unequal treatment among staff members by the SMT. A lack of team-building programmes and development programmes to arm SMTs appeared to be common in both schools.

The first *threat* in *Kgotso* Secondary School was the absence of development programmes linked to the identified weaknesses during the IQMS cycles. The non-attendance of teachers identified made them write similar developmental needs on an annual basis. The second *threat* was the teaching of a subject in which the teacher did not specialize at tertiary level. Thirdly, SMT members without managerial skills and teachers possessing the Primary Teachers' Diploma but teaching grade 12s were seen as another challenge. Lastly, SDT, DSGs and SMTs were not playing their developmental support roles. In contrast to Kgotso Secondary School, Nala Secondary School had the following *threats* in terms of the implementation of the CPD programmes: they were offered during vacation times and after school creating a challenge for those teachers who were using common transport as they had to leave before the end of the session.

Having outlined the SWOT analysis in both schools, the next session presents the priorities from the list of challenges identified in it.

Determining Priorities

As indicated in the SWOT analysis of the two schools, a number of challenges emerged. Since not everything could be achieved in one calendar year it became necessary for the team to discuss the matter with other partners and shortlist a number of priorities. Having done so, once more the team had to consult the teachers, SMTs and SGBs for their endorsement of the prioritized needs. Determining priorities to be attended to is supported by Moloi (2010: 158) and Monyatsi (2006: 152).

The team, with the endorsement of other partners, prioritized the following five items: training of principals and their SMTs; support given to teachers and the SMTs; teacher collaboration; a coordinated plan; and an increase in the pedagogical content knowledge of teachers.

Strategic Plan

The aim of the Strategic Plan was to attend to the priorities mentioned above. In the following paragraphs attention is paid to how each of the priorities was attended to.

Training of Principals and their SMTs

In terms of training principals and SMT members, the following activities emerged: creating an atmosphere conducive for conducting CPD programmes, continuous provisioning of professional development to teachers, role of leaders, monitoring of teachers' work, and motivation of the community to participate in school activities.

The team tasked with the driving of the CPD programmes, in terms of the *training of principals* and SMTs firstly utilized the expertise of the two SMGDs. The first SMGD emphasized the role of the principal in *creating an atmosphere conducive to CPD programmes*. The presentation was held in September 2011. The SMGD said: 'School principals should not only give permission for CPD programmes to take place. Teachers' professional development should be his/her front burner.'

The SMGD was emphasizing the leading role the principal needed to play to ensure that teachers received professional development. The point was not only about giving permission, but in addition the principal's leading role remained a standing item to motivate teachers. At school level and in most institutions it is the leader in the institutions who gives permission for activities to take place. In addition, the leader's attitude towards the activity taking place serves either to motivate or demotivate people to attend the activity. Based on the SMGD's comment she asked that the principals prioritize professional development of teachers.

The second SMGD in the training of principals and SMTs stressed the *importance of continuous provision of professional development to teachers*. The SMGD remarked as follows: 'It is most important that novice teachers are given direction in terms of the school culture. Experienced teachers also need re-skilling. Professional development serves exactly that purpose.' From utterances by the SMGD, it was pivotal that professional development be offered to maintain or improve the school culture. The SMGD concluded by encouraging SMTs to ensure that staff training and mentoring programmes were developed and evaluated as required by the IQMS policy document (DoE 2003: 43).

The third activity on the training of SMTs was given to the principal of Nala Secondary School and the Head of Department (HoD) of Kgotso Secondary School for preparation and presentation in the third training session. The session was held in October 2011. In their presentation during the third training session, SMTs were divided into groups and had to present on the roles they thought leaders needed to play in professional development programmes. The roles that emerged from the different groups included, firstly, the ability to control the work of teachers. The second aspect that emerged was use of systems in running the school. This aspect matched delegation of duties to different structures and teachers. The basis of the allocation of duties should be on their abilities. The third aspect that emerged was planning and the last two were about translating objectives into plans and motivating staff members.

The above activity served to enable SMTs to realize that they had the ability to solve their own challenges. They needed space and time to do what they were led by the presenters to do. The fourth activity, namely the monitoring of the work of teachers, was given to the deputy principal of Kgotso Secondary School and the HoD of Nala Secondary School. The session was held in February 2012, divided into the observation of teachers in practice as well as controlling the tests. The SMTs were also divided into groups and suggested ways in which the two aspects could be attended to. In their presentation one of the SMTs responded: 'Why is the IQMS only requiring one observation of a teacher in a class. Is it fair to judge the teacher on the basis of one lesson?'

Different groups had one thing in common, i.e., it was not sufficient to have one class observation and on its basis conclude whether the teacher was good or bad. As a way forward, an HoD from Nala Secondary School suggested that each term should have a class visit. The suggestion was accepted as one of the SMTs said 'at least based on four class observations per annum, we are in a better way to decide'. To avoid discovering towards the end of the term that work had not been properly carried out an agreement was reached that weekly monitoring of written work be administered. The information from

HoDs would be forwarded to the deputy principal for sending to the principal. SMTs were therefore expected to conduct workshops about the decision and to legitimize it.

The above decision taken by the SMTs as a way of monitoring presentations in classes was a starting point for using their power. Instead of handing themselves to the IQMS document they suggested a strategy that they thought would work better for the development of teachers in their schools. The last item was given to the deputy principal of Nala Secondary School and the principal of Kgotso Secondary School, but they asked how schools could motivate the community to participate in school activities. Emerging from the groups was the issue of time, as communities needed to be given enough time before the meeting. The last two aspects that emerged as important were the representation of community members in the professional development programmes, as well as giving them a hearing.

Support Given to Teachers and the School at Large

The second prioritized item was the *support* given to teachers and the school at large. Firstly, the team made use of the NGO to train teachers, SMTs and SGBs about team-building. The focus was more on what makes a team succeed. The NGO appeared as a complementary role player in the implementation of CPD programmes, taking the two schools to a hotel away from the schools in which they were situated. Expenses incurred were paid for by the NGO.

The second workshop on the support from the DBE and NGOs was held in consultation with the local university and South African Police Service (SAPS). Firstly, the university's representative was to give theoretical reasons for the abolition of corporal punishment. In addition, he supplied teachers with alternative ways of dealing with disruptive ill-disciplined learners. Secondly, a parent who was also a member of the SAPS provided teachers with legal ways of detecting and dealing with children who used marijuana, cocaine or alcohol. Out of this workshop, teachers were to select a group of learners who would serve to discourage illicit behaviour and the usage of drugs by learners. The conclusion followed a suggestion by one of the teachers: 'To avoid the escalation of drug abuse let us use the youth to discourage others from the usage of drugs.'

The above shows the school community's concern about drug abuse, and as a solution to escalating ill-discipline amongst the youth in both schools. A solution generated within the school community stands a chance of sustainability as it originated from the participants and was not imposed upon them. Another advantage that led to a better understanding of the scenario was the presence of the police representative. It was a privilege for the school to have

members of their SGBs with specialist expertise. The decision addressed unequal power relations in discussions as the entire team accepted the teacher's suggestion which therefore came to be owned by the team, and not necessarily by that individual teacher who suggested it.

Teacher Collaboration

The third prioritized item was about *teacher collaboration*. Firstly, the collaboration amongst teachers was led by the NGO and the DBE. Teachers had to indicate topics which they were interested in discussing. Besides the presence of the LFs and the facilitators from the NGO, the greatest proportion of the time spent on teacher collaboration was utilized by teachers, where facilitators divided teachers into groups to solve problems.

The second form of teacher collaboration took place when teachers were expected to form clusters, in the absence of facilitators but with teachers of the same subjects determining their agenda. The sessions served also to build leadership as they alternated roles. Ownership and determining their needs were the greatest achievement of the process. The last benefit was for the teachers to share their experiences and approaches in tackling some of their challenges.

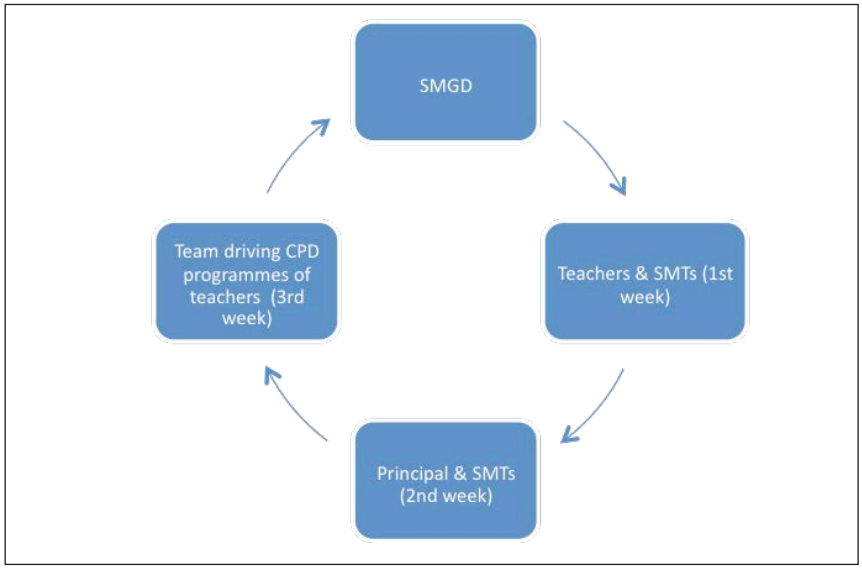
The last form of teacher collaboration was when teachers were revising question papers with their grade 11 and 12 learners. Grade 11 learners from the two schools were separated from the grade 12s, and on the first Friday grade 11s were accommodated at Kgotso Secondary School and grade 12s at Nala Secondary School. For the subsequent Fridays venues were alternated with learners being given question papers to be discussed in groups. Teachers were moving around, 'finding' the successes achieved and challenges encountered by learners. The sessions took four consecutive Fridays, and during the first two the learners tackled paper one in Mathematics, Physical Sciences and Accounting. On the last two Fridays, they dealt with the second papers.

Designing a Coordinated Plan

The next priority area was the *coordinated plan*. In terms of the implementation plan the first week was earmarked for teachers to engage with their HoDs, so they could have inputs from teachers during the management meeting. That also informed the school-based top structure (principal and deputies) on how each HoD ran his or her department as well as future plans. The second week was then earmarked for the SMT to discuss managerial matters, thus showing that the management of the school had a stance and opportunities to table matters to the SMGD. The SMT planned school-based CPD programmes based on the inputs from teachers. The proposed plan was forwarded and discussed in the third week, when the team driving CPD programmes would be meeting.

The third week was earmarked for the team driving the CPD programmes in which teachers and school partners were then engaged. This gave the team time to reflect on the successes and challenges met. Items were categorized as to whether they related to managerial or purely academic matters. What brought success to the plan was the coordination of the activities with the implementation plan as well as the involvement of broader school community links, giving it democratic, ownership and legitimate status.

Figure 1: A Coordinated Plan



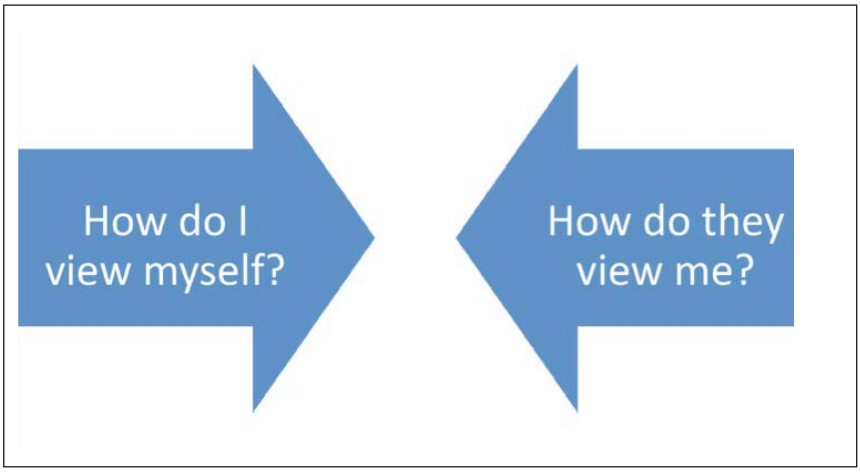
Improving Teachers' Content Knowledge and Pedagogical Practices

The last priority focused *on improving teachers' pedagogical content knowledge and practices*. In order for teachers to implement the agreed upon designed programmes, HoDs and LFs need to support them in what they are doing in class. For novice teachers, consistent support is necessary. In this way teachers can match the theory learnt at tertiary institutions and the practical application of what they need to do when confronted with classroom realities. Based on this study, at least one classroom visit per term would be appropriate. The focus for HoDs and LFs should be on content knowledge and how to present the lesson. Bantwini (2009: 176) affirms that consistent support from the LFs is crucial, sending the message that teachers are being cared for. After

workshops, teachers still need follow-up to ensure that they are able to put into practice what has been learnt.

During the first week of the month teachers meet with their HoD, to set the tone for the month ahead as well as to look at how teachers progressed the previous month and the programmes offered by the NGOs and the LFs. Challenges met with the actual implementation of the theory are also discussed and possible solutions and interesting breakthroughs shared. At the beginning of the second week of the month subject teachers meet with the aim of sharing their progress. Observations of a lesson in practice are made at this stage and the teacher has to conduct a self-evaluation exercise (How I view myself?). The next step is for the peer and/or senior to evaluate the teacher (How do they view me?) (see Figure 2 and Appendices A and B). This stage serves two purposes. Firstly, the appraisee has a chance of being evaluated by the peer. Secondly, the observer of the lesson has an opportunity to learn new approaches and techniques of presenting lessons. Scores are compared, and a post-evaluation discussion and then evaluation session are held. Joint lesson plans and setting of test papers are also carried out at this stage. Lessons plans are prepared for two to four weeks so as to create time for other activities. Tests are set for each month.

Figure 2: How I View Myself?



The third week gives teachers a chance to design their own programmes, which includes reflection of how the teacher performed during the course of the month as well as a plan and contribution. On the fourth week of the month the HoD meets teachers, the purpose being to reflect on how teachers achieved or did not achieve the month's plans as well contributing to the meeting with the LF in the upcoming month.

The designed workshop should provide a platform for teachers to contribute while the LFs, based on their expertise, may try to summarize teachers' presentations in such a way that they have a focal point. Teachers have to leave the workshop knowing what to do, unlike leaving after their presentations without a concluding remark from the LF which leaves them with a variety of perspectives, such as 'I am doing what I think is right.'

Monitoring

As the two schools were working together, monitoring had to take place firstly in the individual schools. SDTs were given a task of drawing up class observation for each school per term, whilst the DSGs had to ensure that teachers adhered to it. The programme was circulated to DSGs and teachers had to check if there were no clashes. For the monitoring of work by teachers, HoDs continued controlling, and once a term teachers of each subject met in the presence of the LFs and facilitators from the NGO to moderate the work already given to learners. The aim was to check the quality and quantity, as well as to copy good practices from other teachers. In order to monitor and consolidate the work in terms of teacher professional development the team was dedicated to driving the CPD programmes in meetings every third week of the month.

Concluding Summary

Our findings showed that the strategy to implement a CPD programme has to consist of various partners involved in the programme. In establishing the team driving the initiative, a democratic process must be followed. Democratizing the process promotes ownership of it while the inclusion of various partners promotes multiple perspectives. Our second finding demonstrated that in order for the team to work collaboratively towards a common goal, training about policy and programmes' implementation is of paramount importance. The activity paves the way for a common vision. A consultative process has to be followed to have a common vision. The SWOT analysis appeared to be the third component in the implementation of the CPD programmes as parents and district-based officials should be amongst the participants, serving to flatten the power hierarchy that exists as teachers, parents and district officials meet.

Schools must be separated to enable each of them to reflect on how it manages and runs its CPD programmes; whilst employing PAR as a methodology creates a discursive space in which participants can discuss matters with the hierarchy structure flattened (Chilisa 2012: 250; Dentith, Measor and O'Malley 2012; Eruera 2010: 1 of 9; Jordan 2003: 190; Sanginga et al. 2010: 698). In the team, parents, teachers and district-based officials should have the same status.

Determining priorities emerged as the fourth component in the implementation process of the CPD programmes, which shortlisted the priorities. The Strategic Plan emerged as the fifth component in the implementation process, and should indicate who does what, activities involved, resources needed, the timeframes as well as the performance indicators (Figure 3). The Strategic Plan keeps the team focused as it relates to the vision created and ensures that some other items related to the vision are not overlooked. In drafting and drawing the Action Plan reference should be made to the common vision. By referring to the vision, any step that does not enable the team to reach its vision should necessarily not be included. In coordinating the Strategic Plan, one or more facilitators should be elected. In this paper, the team elected the deputy principals to lead the drafting and the implementation of The Plan. Within the team, a sub-committee should be developed which will draft the Strategic Plan. The five (or any number on which the team could agree) priority areas need to guide the sub-committee. With the assistance and guidance of the team the sub-committee may be in a position to identify and locate potential facilitators to specific roles in the Strategic Plan.

As indicated above, the Strategic Plan needs to indicate the person(s) who will be responsible for executing certain activities. The purpose is to avoid a situation whereby in the meeting an agreement is reached, but in the next meeting the task/activity has not been carried out. That alone gives the person(s) responsible for executing a certain activity time to prepare and to consult. Indicating the activity to be carried out on a certain day enables the presenters and the attendees to prepare themselves for that particular activity. This also makes it easy for the attendees to participate during the contact session. The time factor is a vital aspect in the plan as it keeps members alert. They need to know when a task has to be completed, as well as the duration of the activity or presentation, and which resources are needed beforehand.

From the sub-committee, the Strategic Plan has to be circulated among team members, who will then either endorse or effect amendments. From the team, the Strategic Plan has to be returned to the teachers and SGB members who are not part of the team. The aim of consulting is to promote participative management and to show respect for their views. The process is lengthy but it creates an open space for debate in a non-threatening environment, as

advocated by CER. As the aim is to empower participants and value their contributions the consultative process promotes ownership of the professional development process.

The first step in the process would be to train principals and the SMT members based on the crucial role they play in the provision of school-based professional development. Presenters in this category should include the SMGD and the SMT members, with the former responsible for giving support to the schools' SMTs and support to the staff in terms of providing professional development programmes. The inclusion of the SMTs in providing programmes for other SMTs is to give them the confidence and the autonomy in providing the programmes in the absence of the SMGDs. The inclusion of SMTs in implementing the professional development programmes will also serve to sustain the programme.

The second step in the Strategic Plan would be to seek support from the DBE, the NGOs and the local university. This creates a bond to sustain support given to teachers, principals and schools. The NGO can first provide support in monetary terms, when there is a need. Secondly, it can employ staff to provide additional support to schools. The local university, in partnership with the DBE, can provide service in terms of classroom management or subject-specific needs. The extent of support given to schools will depend on their needs. The DBE has a crucial role to play in the provision of professional development; however teachers need not depend solely on the programmes of the DBE.

The next step would be about teacher collaboration, to enable teachers to learn from one another and try out new ideas. Sharing stories of success in classroom practice and enhancing teachers' beliefs in their power to make a difference in the learners' learning process are amongst the advantages of teacher collaborations. Teacher collaboration, firstly, could be under the leadership of the LFs or NGO facilitators; the advantage of this approach being that it gives weight to collaboration based on subject expertise. The second form of collaboration occurs when teachers meet and draw up their own agenda, the aim being to encourage the independence of teachers in running and owning their development and growth.

The last form of teacher collaboration takes place when teachers from more than one school plan activities or revise question papers with learners. The distinct feature about this is that learners in groups answer questions and thereafter a discussion of the answers takes place in which teachers of the same subject are present. In this way, it is not only the learners who are learning, but also teachers, from their counterparts on how to attend to specific questions.

The next item on the Strategic Plan is to have a coordinated plan, as the coordination of activities serves to inform members well in advance of the

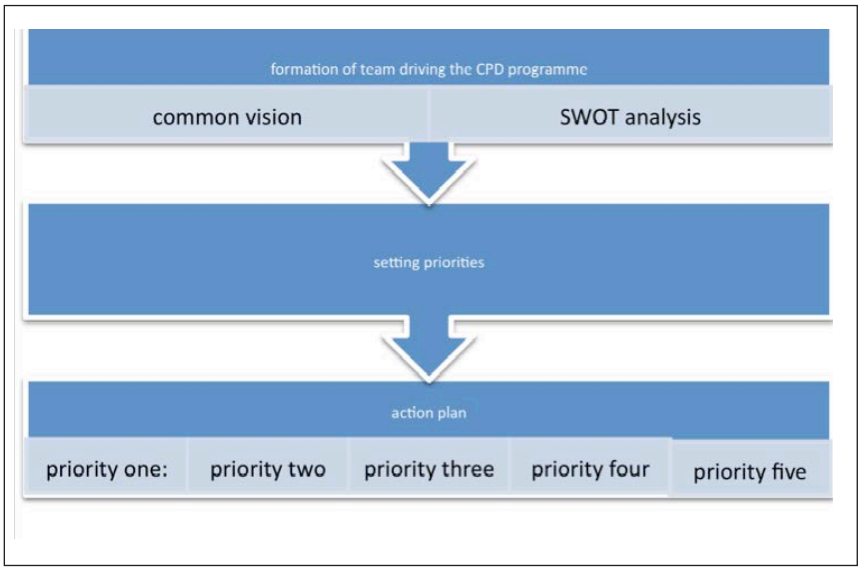
activities to take place as planned. To keep all departments in line they need to have a one-hour meeting every first week of the month, in which to share good practices and plan ahead. The HoD also gains input from teachers to be tabled during the second week of the month, when the SMT meets for an hour. The third week is earmarked for the team dedicated to the implementation of the CPD policies to meet. As it does so it has input from teachers, through their HoDs, and as it plans ahead it is also important that the team reflect on its activities. Furthermore, one of the major tasks of the team (Nagy and Fawcett n.d.: 3 of 5) is to make sure that members report on the activities assigned to them.

The fifth item, also a cornerstone in the Strategic Plan, is to ensure that there is improvement in the teachers' pedagogical content knowledge and practices. This is achieved firstly through one-hour contacts between the HoD and teachers during the first and fourth weeks of the month. The aim is to reflect and plan ahead. The second step in improving the practices of teachers is through mentoring. Novice teachers are to be allocated mentors to guide them through the career. Any item that needs attention should be included in the teacher's PGP for attention. The third aspect is about classroom observation. Findings revealed that one classroom observation per term is not a fair judgement on the teachers' strengths and weaknesses. The findings show that four observations per annum are more appropriate to give an overall picture of the teacher. Through support and mentoring after the first term's observation a good teacher can be turned into an excellent one.

Figure 3: Template of the Strategic Plan

ACTIVITY	WHO IS RESPONSIBLE	DATE	RESOURCES NEEDED	PERFORMANCE INDICATOR

Figure 4: Strategic Plan for the CPD Implementation Policy

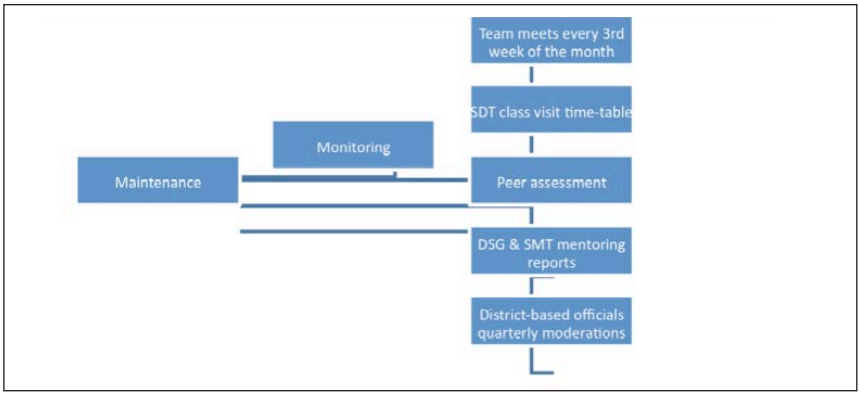


The sixth component is about monitoring which involves the provision of continuing support to sustain and maintain the new practices (Moloi 2010: 165). The process is carried out through regular and irregular series of observations in time to show the extent of compliance with a formulated standard of practice or degree of deviation from the anticipated norm. In this strategy there are four complementary forms, in which monitoring is carried out.

Firstly, during the third week of every month the team dedicated to the implementation of the CPD policies should meet. The initial meetings should be to identify the professional development needs of teachers, the next to focus on planning to address the identified needs. As soon as the planning process begins the team should focus on reports on the progress made by individuals allocated certain tasks to fulfil. The process is not linear, but amendments are made if the need arises.

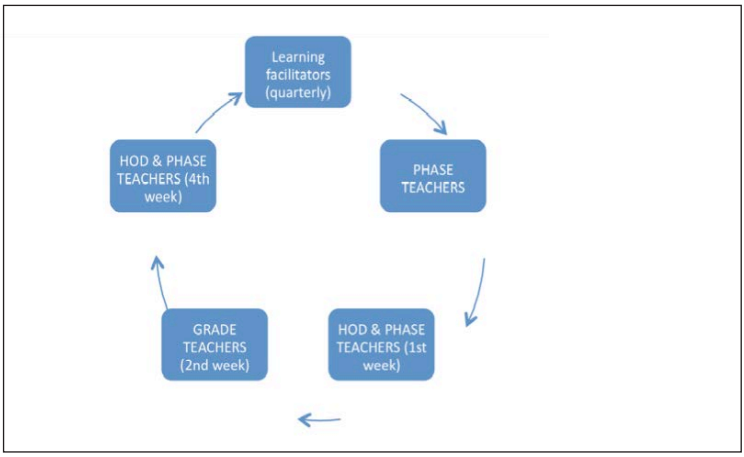
Secondly, quarterly class visits should be conducted by the DSGs (Figure 5). The SDT has to be allocated a duty of drawing up the timetable for class visits. HoDs are to ensure that it is followed and any deviation is to be reported to the SDT. On a monthly basis the mentor and mentee should provide a report to the DSG and the SMT.

Figure 5: Sustainability of the CPD Programme for Teachers



Thirdly, twice a month, HoDs should meet teachers for a one-hour session (Figure 6). Sessions should be held during the first and the fourth weeks of the month, the aim of the sessions being to share good practices and challenges encountered. In addition, the meetings can give the HoDs an overview of the departments they are running so as to report during the management meetings on the second week of the month. Lastly, the HoDs should also use these sessions to monitor the progress of teachers. As the management meets during the second week for one hour, the subject teachers should also meet in the absence of the HoDs. Subject heads should lead in this process to monitor and share successes and challenges in their specific subjects.

Figure 6: Monitoring and Sustaining the CPD Programme



Lastly, the clustering of schools by the LFs should also form part of the monitoring process. The sessions should take place once per term. Firstly, in this session teachers from different schools share their experiences, and where there are challenges try to address them. The second form that this monitoring session takes should be when the LF moderates the work of teachers. In this form, teachers moderate each other's work while the LF oversees the entire process. The process is transparent as teachers moderate each other's work in an open manner. The process is in line with the principles of openness, democracy and transparency as advocated by CER (Jordan 2003: 190). The LFs furthermore use the workshop evaluation form (tool) (Appendix C) to receive inputs from teachers. The teachers' comments include how the session was conducted, and suggested topics for future contact sessions. Questions on the form are designed in such a way that they are open-ended.

In terms of monitoring, this paper has contributed to the body of knowledge, firstly as a coordinated, systematic way of monitoring the professional development of teachers. The process is transparent and developmental. Secondly, members of the team to which all this reporting system converges have parents. They have first-hand information from their children and can easily compare the agreements of the team and what transpires in the classroom. Based on the vested interest parents have in education because of their children, they are more likely to influence the committee to do what is best for them. The approach is empowering (Mertens 2010: 30), as advocated by CER, the theoretical framework couching this paper.

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APPENDIX A: SCHOOL-BASED PEER EVALUATION FORM for development purposes – The teacher to be observed

TERM: ……..

Pre-evaluation (what **I** need to be developed at): ……

……

……

……

NAMES: presenter	**DATE**	**LESSON OBSERVATION**		**ACTIVITIES AND ASSESSMENT(S) GIVEN TO LEARNERS**	**COMMENTS**
		Introduction			
		Presentation			
		Conclusion			
		What I liked about my lesson			
		What I disliked about my lesson			
		I wish to introduce this in my teaching next time			

APPENDIX B: SCHOOL-BASED PEER EVALUATION FORM

The teacher(s) who observed

TERM: ……..

NAME: observer(s) + presenter	DATE	LESSON OBSERVATION		ACTIVITIES AND ASSESSMENT(S) GIVEN TO LEARNERS	COMMENTS
		Introduction			
		Presentation			
		Conclusion			
		What I liked about my colleague's lesson			
		What I disliked about my colleague's lesson			
		Suggested improvements on presenting the lesson in future			

Recommendation about my peer's/subordinate's presentation: ……

……

……

Post observation: after presentation: we discussed/did not discuss our findings:

Commends: ……

……

……

APPENDIX C: WORKSHOP/PRESENTATION EVALUATION TOOL

FACILITATOR'S ROLE IN THE CPD PROGRAMME:

……

……

……

AUDIENCE ROLE IN THE CPD PROGRAMME:

……

……

WAS THE PRESENTATION TEACHER-CENTRED OR LEARNER-CENTRED? ANY RECOMMENDATION(S):

……

……

WHAT I LIKED MOSTLY ABOUT THE PRESENTED PROGRAMME:

……

……

……

WHAT I DISLIKED ABOUT THE PRESENTED CPD PROGRAMME:

……

……

OVERALL IMPRESSION ABOUT THE CPD PROGRAMME:

……

……

SUGGESTED TOPICS/ITEMS TO BE DISCUSSED IN THE NEXT CONTACT SESSIONS:

……

……

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An Investigation into the Effectiveness of the University Curriculum in Preparing Pre-service Technology Teachers

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Abstract

The purpose of this study is to investigate the effectiveness of the university curriculum in preparing pre-service technology teachers. The study examines the course guide of the technology education course at one of the universities of technology in South Africa in relation to grades 7–9 (senior phase) of the technology policy document. The study found that the university technology curriculum places emphasis on both content breadth (CB) and content strands (CS). However, some of the CSs in the university technology curriculum have no relevance to the CB and were not designed to enhance its depth. Therefore, this means that the CSs of the university technology curriculum were not designed to focus on the notion of 'fitness-for-purpose' which is market driven. However, it is imperative that students be given an opportunity to explore both CB and content depth (CD) as well as how other CSs can be used to develop a deeper understanding of CB.

Résumé

Le but de cette étude est d'examiner l'efficacité du programme universitaire de formation initiale des professeurs de technologie. Il s'agit d'un examen du guide pédagogique de technologie utilisé dans une des universités de technologie en Afrique du Sud, notamment par rapport aux années 7-9 (cycle supérieur) du document de politique technologique. L'étude a révélé que le programme d'enseignement de la technologie à

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l'université met l'accent sur l'étendue du contenu (CB) et les thèmes du contenu (CS). Cependant, certains thèmes du contenu (CS) du programme d'enseignement de la technologie à l'université ne sont pas pertinents par rapport à l'étendue du contenu (CB) et ne sont pas non plus conçus pour améliorer sa profondeur. Par conséquent, cela signifie que les thèmes du contenu (CS) dudit programme ne sont pas conçus pour se focaliser sur la notion de l'«aptitude aux fins recherchées», qui est axée sur le marché. Toutefois, il est impératif que les étudiants aient l'opportunité d'explorer à la fois l'étendue du contenu (CB) et la profondeur du contenu (CD) ainsi que la façon dont d'autres thèmes du contenu (CS) peuvent être utilisés pour une meilleure compréhension de l'étendue du contenu (CB).

Introduction

The technology teacher training programme plays a vital role in African countries, especially in the aspect of educational reform. The new South African curriculum and that in other countries like Nigeria (Aguele and Agwagah 2007) have acknowledged the need to produce engineers, technicians and artisans to develop a technologically literate society for the modern world. In 1998, technology education was introduced for the first time in the South African curriculum as a learning area. The main purpose of teaching technology education in South African schools is to produce learners who are technologically literate and to provide them with an opportunity to 'develop and apply specific design skills to solve technological problems; understand the concepts and knowledge used in technology education and use them responsibly and purposefully; and appreciate the interaction between people's values and attitudes, technology, society and the environment' (Department of Basic Education (DBE) 2010: 13). However, a challenging issue was that the majority of teachers who were teaching technology had not been trained in this field because it was a new learning area. The fact that the teacher training curriculum at university did not include technology exacerbated the problem.

In early 2000, most universities introduced a technology course in their teacher training programme in order to address the challenge faced by schools. The teacher training programme at university level usually has two components, content knowledge (CK) and pedagogical training. However, universities differ in their approach to training. For example, in some universities students first participate in a specific programme that focuses on CK education and only during their final year of study do they enrol for the fundamental education courses; in other universities, the two programmes run concurrently with a focus on both CK and fundamental education courses. In the university where this study was conducted the programmes are presented concurrently in the

education department. However, the extent to which CK prepares technology teachers to teach school content knowledge should be explored.

In accordance with this point of view, UNESCO (2002: 8) has indicated that teacher training should improve student teachers' educational background; increase their CK; develop pedagogical knowledge of their subject; increase learners' knowledge within the relevant context; and develop practical skills and competencies. Therefore, teacher training programmes in South African universities are not exempt from these objectives as practical courses are included in their teacher training programmes. In support of this view, Waghid (2002) conducted a study to examine whether the emergent shift in knowledge production can transform higher education in South Africa to the extent that it becomes more socially relevant. The study found that the knowledge produced at a university does not integrate with the needs of the community in which a student may practise on completion of a degree. This was the situation in the past and it is not likely to have changed.

Hence, this study sheds some light on the following questions, especially in relation to the technology education programme, and proposes that its findings could be applied to other fields. Firstly, should pre-service teachers obtain CK that emphasises only the CS (Kahan, Cooper and Bethea 2003)? In this context, CS refers to any subject domain concept found in any field of study. Secondly, should they obtain subject content knowledge (SCK) that covers the CB that is relevant to the level at which they will be teaching (Heritage 2007)? Lastly, should the curriculum address the SCK that is relevant and then move forward to deeper concepts (Doerr 2007)? The answers to these questions have potential consequences in technology teacher preparation programmes, especially given the growing emphasis on the need for teachers to gain a deeper understanding of the subject matter relevant to their chosen field of expertise (Hirsch 2001).

Research Questions

In this study, our interest focused on the following research questions:

- To what extent does the university curriculum cover the CB of the school curriculum?
- To what extent does the university curriculum cover the CD of the school content breadth concepts?
- To what extent do university curriculum CSs enhance school CB?

Effective Content Knowledge

Teacher training programmes have experienced difficulties in selecting the CK essential for teaching (Ball, Thames and Phelps 2008). This is not an exceptional case for technology education courses as a developing field of learning in the education sector. Peters (1977: 151) argues that if a programme is regarded as a specific preparation for teaching, priority must be given to a thorough grounding in its basic content. It is noteworthy that most teacher training programmes in all public universities were designed on the assumption that they would be based on the National Policy Framework for Teacher Education and Development (2007) as well as on the requirements of the Norms and Standards for Educators (2000). In practice, current training programmes are based on the Minimum Requirements for Teacher Education Qualifications (2011) which were developed from the National Policy Framework for Teacher Education and Development (2007) and the Norms and Standards for Educators (2000). These policies are provided to guide those who develop education programmes in a higher education institution (HEI).

Firstly, these policy documents stipulate that the primary purpose of a Bachelor of Education degree (BEd) is to provide graduates who are well equipped with the required SCK skills to teach this particular specialization. Secondly, teacher training programmes in the higher education system should aim to produce the kinds of teachers that the country needs. Lastly, the policy indicates that a competent teacher should possess the following attributes: specialism in a particular learning area, subject or phase; specialism in teaching and learning; specialism in assessment; be a curriculum developer, leader, administrator and manager; be a scholar and lifelong learner, and a professional who plays a significant role in a community. Hence, this study argues that the technology teacher training programme should provide graduates who have mastered school CK as minimum knowledge and are equipped to teach it effectively.

To explore how teacher training programmes can prepare pre-service teachers, the South African Department of Education (DBE 2010: 10) has provided a guideline and indicated in the national curriculum statement that it

> [ext] aims to produce learners that are able to identify and solve problems and make decisions using critical and creative thinking; work effectively as individuals and with others as members of a team; organize and manage themselves and their activities responsibly and effectively; collect, analyse, organize and critically evaluate information; communicate effectively using visual, symbolic and/or language skills in various modes; use science and technology effectively and critically showing

> responsibility towards the environment and the health of others; and demonstrate an understanding of the world as a set of related systems by recognizing that problem-solving contexts do not exist in isolation. [ends]
>
> Consequently, teacher training programmes should strive to produce teachers with such competences in order to be effective.

In response to these key competences, most of the literature makes intensive investigation into measuring teachers' pedagogical content knowledge (PCK) during pre-service preparation and in-service training. According to Shulman (1987), PCK is an amalgamation of CK and PCK. For instance, Ball, Thames and Phelps (2008) conducted a study to 'investigate the nature of professionally-oriented subject matter knowledge in mathematics by studying actual mathematics teaching and identifying mathematical knowledge for teaching based on analyses of the mathematical problems that arise'. They argue that teachers need to be conversant with all mathematical topics in the curriculum that they must teach, as well as acquiring a deeper knowledge above that required at school level. As a result of their investigation, these authors identify four domains that reflect competent teaching relative to comprehensive knowledge of the relevant subject matter.

The first domain, common content knowledge (CCK), is defined as the mathematical knowledge and skill used in any profession, including teaching. The second domain, specialized content knowledge (SCK), is defined as subject content knowledge and skill that is unique to teaching a particular subject. The third domain, knowledge of content and students (KCS), is the knowledge that combines knowing about students and their knowledge of mathematics. The last domain, knowledge of content and teaching (KCT), combines knowing about teaching and knowing about mathematics. In similar vein, Marshall and Sorto (2012) conducted a study analysing the effects of teacher mathematical knowledge on student achievement. The study found that teachers have different kinds of mathematical knowledge, for example, CCK andSCK. Pitjeng (2014) observed novice graduate science teachers' CK and topic specialized pedagogical content knowledge (TSPCK). Such literature attempted to describe how pre-service teachers' knowledge should be structured in a particular programme. However, issues concerning the specific type or scope of CK, as well as the breadth and depth that pre-service teachers should receive during a teacher training programme remain imprecise.

Seeking Breadth, Depth and Strands

What are the distinctive CB and CSs that should be expected of BEd graduates in South African university programmes? Given the diversity of their educational backgrounds, the possible uncertainty regarding their teachers' experience and the variety of school contexts and environments in which they have been taught, the argument is that BEd programmes in universities should focus on helping students acquire two core competencies, CB and CD. This proposal supports Freedman's (2008) notion that university programmes should be designed as being 'fit-for-purpose' i.e. be more market driven than previous approaches.

The term CB refers to the need for exposure to a wide variety of topics in the scientific disciplines (Schwartz et al. 2008). Li, Klahr and Siler (2006) indicate that CB refers to the scope or number of topics covered whereas CD refers to the deeper coverage of fundamental concepts that are beneficial to master (Schwartz et al. 2008). Teaching to develop deeper understanding upholds the view that certain fundamental concepts need to be taught and given greater attention. Students who have a deeper understanding of fewer scientific concepts in high school have actually shown greater success in college science coursework (Schwartz et al. 2008). Hirsch (2001) suggests that the best way to learn a subject is to move from broader knowledge, which is breadth, to deeper knowledge.

Murtagh (2001) argues that balance between breadth and depth of the content is more productive than a focus on either extreme. In addition, Wright (2000) also advocates that a balanced approach is more effective because it will maintain the enthusiasm of students. According to Irwin (2011), breadth refers to the variety of experiences, content and materials, whereas depth is about the intensity that accompanies understanding a set of ideas in a profound way and also the mastery of a body of knowledge. Hirsch (2001) argues that learning to learn and gaining deeper understanding depend on broad knowledge, but not just any knowledge will suffice. Hirsch identifies four principles as a guideline for choosing content. This author firstly indicates that the ability to learn something new is not primarily a general or formal skill but chiefly a domain-specific skill which depends on the relevant knowledge that already possessed by the learner about that specific subject. Secondly, the general ability to learn a specific subject is closely correlated with general knowledge. Thirdly, the best way to learn a subject is to grasp its general principles and to study numerous, diverse examples that illustrate those principles. Lastly, the ability to start from a broader, general knowledge and then progress to deeper knowledge provides the best approach.

CSs are the 'big ideas' that provide a variety of teaching strategies and activities to help teachers develop their students' understanding of concepts (Kajander and Holm 2013). According to the National Council of Teacher of Mathematics (NCTM) Standards document (1989), CSs are topics that appear to be separate and distinct but which are woven together intricately to develop student understanding. In this context, CSs are all topics in the university curriculum but not in the school curriculum; they are used to enhance students' deeper understanding of concepts learned at school.

Therefore, this study explores the type(s) of content knowledge on which a university focuses. In other words, does the university curriculum put emphasis on CB (specific subject content knowledge) that is relevant to the level at which the pre-service teacher will be teaching, or on CSs (any technology subject domain concepts), or should the university address both CB and CSs in order to increase deeper understanding of the concepts? In this paper, CB refers to the CK at the school-level that pre-service teachers will be teaching on completion of their degree. CD refers to the various concepts that cultivate an understanding of CB. CS refers to concepts that are technological in nature but develop CD, although they are not relevant to the CB.

Methodology

This exploratory study employed a qualitative research approach (Creswell 2013). The data was collected via document analysis of the university technology education curriculum and school technology content. Document analysis is a systematic procedure that can be used to examine and interpret data in order to elicit meaning, gain understanding and develop empirical knowledge (Bowen 2009). The school policy document, as well as study guides, were analysed to envisage the gap between the two sets of documents. For the analysis, the researcher used the policy document for Technology (Curriculum Assessment Policy Statement (CAPS) 2013) of the Department of Basic Education to develop the checklist which then served as a minimum benchmark for the CK that students must acquire before they graduate. In order to explore the CK coverage of the university curriculum in relation to the school curriculum, this study scrutinized the topics based on the qualitative content analysis method (Elo and Kyngäs 2008; Graneheim and Lundman 2004). Graneheim and Lundman (2004) describe qualitative content analysis as a method that focuses on the subject and context, emphasising the differences between them and their similarities within codes and categories. They further indicate that in this method, categories are groups of content that share a commonality.

Findings and Discussion

The study compared the technology curriculum of the school with that of the university. The data was taken from the school curriculum for the subject technology, i.e. CAPS grades 7–9 and the university curriculum for the technology course, i.e. levels 2–4. The content is taught at university only from level 2, because at level 1, students are taught only the background and development of technology.

In technology education, there are four themes to be covered during the year that are supported by the methodology for technology. These themes encompass a variety of topics that are presented in order to complete the methodological process, which is called the backbone of the technological process. This methodology is called the technological process or design process. As each theme is presented, it is integrated with the relevant technological process thereby providing an output in a form of a prototype. Table 1 shows topics that appear in both curriculums, topics that are only in the school curriculum, topics that are only in the university curriculum and topics that are only covered practically. Technology education as a subject, both at school and university, must integrate the theoretical components with the practical.

Table 1 above shows the topics covered by the university curriculum, as well as the school curriculum. The data in row 1 shows the topics covered in both curriculums. The data shows that approximately 60 per cent of the topics are covered in both curriculums. The data in row 2 illustrates the CB which includes topics in the school curriculum but not in the university curriculum. The data shows that there are a number of topics not presented at university but which students are expected to teach at school level. Row 3 indicates CSs which are topics that are in the university curriculum only but are not clearly shown as being in the school curriculum. These topics do not indicate any relevance to CB or development of CD. Therefore, this means that these topics predominantly reflect CSs rather than CB. The data indicate that, to some extent, the university curriculum is partially relevant but not comprehensive enough in terms of covering all the topics required by the school curriculum. However, the CD of this curriculum, which includes practical components, should be explored.

Table 1: Technology curriculums

Topics in both curriculums	Content breadth (CB)	Content strands (CSs)
STRUCTURE Classification of structures: natural and man-made; Types and definition of structures: shell, frame and solid; Stiffen materials/structure: triangulation, tubing and folding; Materials to ensure stability, strength and rigidity; Define frame structure; Purpose of structural members/components in wood and steel roof trusses (king and queen post, strut, tie, rafter, tie beam); Types of forces (shear, torsion, tension, compression); Types of bridges (beam, suspension bridge, etc.); Structural failure: Forces can be static or dynamic; Load can be even or uneven	**STRUCTURE** Pylons	**STRUCTURE** Processing soil Types of soil; Processing soil to build; Choosing best soil to make mud bricks; Different types of bricks; Different methods of making bricks
PROPERTIES OF MATERIALS Properties of various construction materials: Mass/density; hardness; stiffness; flexibility; corrosion resistance and prevention of corrosion. Adapting material to withstand forces (reinforcing concrete, polywood); Metal section (i-beam, angle iron, T-bar etc); Preventing metals from corrosion assembling	**PROCESSING MATERIALS** Textiles used by fire- fighter/ NSRI or dangerous profession Plastic bags (bio-degradable plastic shopping bags) Packaging of paper and cardboard Emergency food	**PROCESSING MATERIALS** Types of food that can be preserved; Different methods of preserving food

ELECTRICAL SYSTEMS Simple electric circuit (cell, switch, conductor and a bulb or buzzer; Components symbols: Simple circuit components and their accepted symbols using input devices: electrochemical cell, generator, solar panel; output devices: resistor, lamp, heater, buzzer, motor and control device: switch); Advantage and disadvantage of series and parallel circuit; Logic gates (AND AND/OR logic gates); Introduction of Ohm's law; Resistance colour codes; Control switches: push, SPT, SPDT, DPDT; Diodes and LED; Transistors; Sensors: input devices: LDR (light-dependent resistor); thermistor; Touch or moisture detector; Capacitors; Simple electronic circuit: assembling	**ELECTRICAL SYSTEM** Simple circuit components and their accepted symbols using (input devices: generator, solar panel; output devices: heater, buzzer, motor). Making batteries using fruit, vegetable and salt water batteries . NPN Transistor	**ELECTRICAL SYSTEM** Different methods of moulding
MECHANICAL SYSTEMS Levers; Linkages; Cranks; Pulleys; Belt drives; Chain and sprocket systems; Gear and gearing; Spur gears; Other types of gear; Hydraulics; transmitting forces in a hydraulic; Mechanical advantage of a hydraulic system; Controlling hydraulic system; Advised hydraulic systems; Advantage and disadvantage of hydraulics	**MECHANICAL SYSTEMS** The wedge (inclined plane or ramp, door wedge, knife blade etc).	**MECHANICAL SYSTEMS**

Conclusion

The study found that the technology course at university reflects integration between itself and the school curriculum with reference to CB. This paper has investigated the types of content knowledge that the university curriculum emphasises when developing a teacher training programme. It explores, on the one hand, whether the university curriculum emphasises CB (specific subject content knowledge) that is relevant to the level at which students will be teaching, or CSs (any technology subject domain concepts), or whether, on the other hand, it addresses the school's CB (subject content knowledge) that is relevant, and then moves on to the CD of the concepts.

Firstly, the findings of the study indicate that the university technology curriculum includes a number of topics that are required by the school technology curriculum. This means that the university technology curriculum does place emphasis on the school CB (specific content knowledge). However, the data also indicates that there are some topics required by the school CB that the university does not cover. This is in contrast with Brown's approach (2009) arguing subjects at both school and university must complement each other regarding the themes and topics to be covered. Lastly, the data also indicate that there are some CSs covered by the university technology curriculum that cannot be considered to develop CD. As a result, these CS topics are neither associated with any CB nor established in order to cultivate the CD.

In conclusion, the study has found that the university technology curriculum places its emphasis on both CB and CSs. However, some of the CSs that were introduced into the university technology curriculum have no relevance to the CB, nor are designed to develop the CD of CB. Therefore, this means that the CSs of the university technology curriculum have not been designed to focus on the notion of 'fitness-for-purpose' which is market driven. However, it is imperative that students be given an opportunity to explore both CB and CD as well as how other CSs can be used to develop a deeper understanding of CB. Although the findings of this study cannot be generalized, because only one university was observed, the study's results could be used in other similar contexts.

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'From Cradle to Grave': Transforming South Africa's Learning Ecologies

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Abstract

This article examines key organizational principles that underpin responsive transformation strategies that have the potential to create spaces for critical engagement with South Africa's basic education post the 1994 democratic elections. The article deploys various metaphors like the 'ants, ecology, London Tube and bridge construction' to unravel the deeper elements for transforming schools into sustainable learning ecologies. It concludes with an articulation of plausible interventions that the country may deploy to improve educational quality and the system's efficacy.

Résumé

Cet article examine les principes organisationnels clés qui sous-tendent les stratégies de transformation réactives ayant le potentiel de créer des espaces pour l'engagement critique dans l'éducation de base en Afrique du Sud après les élections démocratiques de 1994. L'article déploie diverses métaphores comme «les fourmis, l'écologie, le métro de Londres et la construction de ponts» pour éclaircir les éléments plus profonds en vue de transformer les écoles en environnements d'apprentissage durables. Il conclut par une articulation des interventions plausibles que le pays pourrait déployer pour améliorer la qualité de l'éducation et l'efficacité du système.

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Introduction

In his State of the Nation Address to Parliament on 24 May, 1994, the former President Nelson Rolihlahla Mandela implored South Africans to 'Seize the time to define ourselves, what we want to make of our shared destiny'. It was a poignant call for a country that was at a political 'border crossing'. It was a requisite stance to affirm a new political dispensation and potential endeavours to deepen democracy and improve socio-economic livelihoods. Mandela's call was also a symbolic gesture by the head of government to give the ordinary citizenry much needed impetus to actively influence governance in a new democracy. A new dispensation was born amidst chasms in social justice, socio-economic development and sustainable growth for all citizenry requiring further engagement and interrogation.

Tumultuous years of the apartheid regime and highly institutionalized racial segregation policies curtailed South Africa's socio-economic development and global acceptance. The country was a 'black sheep' of the global village with dire socio-economic consequences. The new political order under the African National Congress (ANC) led government promised to address challenges of reconciliation and social cohesion.

Mandela's national call for exigent action to political matters resonates with the theme of the colloquium, namely, 'Sustainable Rural Learning Ecologies: Border Crossing'. Years of segregated educational provisioning fossilized the rural-urban divide with dire socio-economic consequences including unsustainable rural-based ecologies.

The notion of 'Border Crossing' invokes the ideals Mandela implored South Africans to embrace and practice. At the intellectual (philosophical) level the colloquium challenges educational practitioners, researchers and academics to interrogate educational provisioning in South Africa. It is expected that such dialogues will shed more understanding on, inter alia, clarity of vision, resource efficacy (staffing and infrastructure), governance, leadership, school performance and achievement, and so on. It is hoped that the by-product of such discourses will draw evidence from research and implement appropriate interventions to change the trajectories of learning ecologies.

Rethinking Learning Ecologies: A Metaphorical Landscaping

Transforming learning ecologies into competitive spaces challenges learners to breach knowledge boundaries. It is complex due to intertwined factors at play and their causal effect. The Global Competitiveness Report 2014–2015, for instance, enumerates (i) institutions, (ii) infrastructure, (ii) macroeconomic environment, (iv) health and primary education, (v) higher education and training, (vi) good market efficiency, (vii) labour market efficiency, (viii) financial

market development, (ix) technical readiness, (x) market size, (xi) business sophistication, and (xii) innovation as the key pillars for global competitiveness. The prevalence of these pillars does not automatically guarantee success and competitiveness. It is their strategic alignment and integration into governance systems that might adapt the trajectories of learning ecologies to twenty-first century challenges.

Transforming learning ecologies is dialectically linked to infrastructure functional management and efficacy. Years of apartheid regime curtailed the country's optimal growth in infrastructure development. And the impact was more evident in the provisioning of educational facilities for black communities during the apartheid regime. The new regime still grapples with redressing the backlog. The Global Competitiveness Report 2014–2015 observes that South Africa' competitiveness dropped in key areas of development such as goods and services, financial market development, technical readiness, and innovation. Regression in these key areas also impacted on governance and operational efficacy. A stable economic environment stimulates economic growth, innovation and technology. It can influence the provision of quality education through intelligent utilization of research and equitable allocation and use of resources in rural-based ecologies. It will take some decades to achieve complete social redress across governance spheres.

The Global Competitiveness Report 2014–2015 also recognizes South Africa's incremental growth in infrastructure development, higher education and training, and labour market efficiency. These three identified growth areas play a crucial role in the transformation of education by providing requisite physical structures, qualified personnel and a buoyant labour market for strategic partnerships in education and economy. Twenty years on, South Africa still grapples with seismic growth in poverty. Youth unemployment and underperforming education are of concern. The socio-economic conditions require urgent interventions. Research-linked approaches would create a base for future socio-economic development. Perhaps, robust transformation entropy would suffice.

Entropy as a principle in physics states that when systems are not continuously maintained they collapse with unintended consequences. Thermodynamic systems illustrate intricacies of entropy at play. Entropy does apply to natural contexts, when nature self-regulates to align with ecological changes. Given its historical challenges, South Africa's basic education could do with some robust entropy for sustainable rural-urban learning ecologies. To unpack plausible transformation modalities for sustainable learning ecologies, (a) ecology, (b) ants, (c) London Tube/Underground trains, and (d) bridge construction will be used as metaphors for amplification.

The Wikipedia definition of ecology is 'the scientific analysis and study of interactions among organizations and their environments, such as the interactions organisms have with each other and their biotic environment'. Understanding the chasms of ecology creates better planning and deployment of effective conservation interventions for sustainable biodiversity. The symbiotic relationships between species and their environment illustrate the nimble balancing (entropy) act required for sustainable ecology and biodiversity. Learning ecologies share fundamentals of natural ecologies in terms of stakeholder relationships that impact on the provisioning and quality of education.

Recently, I was left speechless when watching a documentary about a colony of ants executing an audacious 'border crossing' of the Amazon River for sustainability. It is plausible that ecological degradation forced the ants to review their survival. Their mission was simple: 'cross the Amazon River without drowning the Queen and her eggs' to a more sustainable ecology. It was a daring expedition that could have easily ended tragically. Were the plan to fail, the entire colony would be wiped out.

Equipped with nothing more sophisticated than tiny brains, the ants hatched a plan – using only tiny legs, they formed a floating raft to transport the Queen and her eggs to a more sustainable ecology (environment). At face value, the ants' plan appears simple and risky; however, closer scrutiny confirms that it was based on very sound strategic and organizational principles, namely:

- clarity of vision and mission (purpose) of the colony's survival and sustainability
- requisite skill sets and capacity
- innovative change management strategies
- professionalism
- organizational efficacy
- excellent work culture and ethos.

Environmental (ecological) changes forced the colony of ants to think strategically about how to reorganize themselves for survival and sustainability. Armed with a clear vision, careful selection and integration of skill sets and shared work culture (responsibility), the border crossing of the Amazon River was accomplished. The ecology and ants metaphors offer crucial lessons on plausible interventions, shrewd planning and organizational execution of plans. Similarly, transforming learning ecologies requires careful planning and meticulous application of research intelligence and organizational principles to achieve the envisaged mission – the complexity of the ants' plan and potential risk factors to successfully cross the Amazon River. Requisite planning and

sharing of tasks were followed to the letter and the audacious expedition was accomplished. Bringing radical changes to learning ecologies requires more than just tinkering with the obvious – implementing recursive curriculum changes. South Africa to date has had numerous and recursive curriculum changes post-1994, for instance, the adoption of the Outcomes Based Education (OBE), Curriculum 2005, the Curriculum Assessment Policy Statement (CAPS), and so on. Regrettably, this experimental mode and approach has not enhanced the quality and creation of sustainable learning ecologies for the twenty-first century.

The transformation juggernaut must garner speed to reach the destination – the provisioning of quality education and sustainable learning ecologies. Twenty-one years on, significant transformation progress has achieved policy formulations as evidenced by:

- The Employment of Educators Act (1998)
- The National Strategy for Further Education and Training (1999–2001)
- The Education White Paper on Early Childhood Development (2000)
- Action Plan to 2014: Towards Realisation of Schooling 2015
- White Paper 3: A Programme for the Transformation of Higher Education (1997)
- Annual National Assessments Results (2011 and 2014)
- The Education White Paper 6 on Inclusive Education (2001)
- The Delivery Agreement for the Basic Education Sector (2010), and so on.

Exponential learner enrolment increases in the foundation phase (Grade R) and improved national pass rates for grade 12 learners indicate a steady progress in changing the education landscape (Monyooe et al. 2014).

Implementation of the education policies listed above illuminates glaring gaps in creating a balance between policy proliferation and rolling out effective implementation mechanisms. The need for expediency (overseeing instant policy changes to pacify public anxiety) did not engage strategic modalities to address historical and systemic chasms. Having secured policy frameworks, it was assumed that historical and systemic challenges would be covered by policy directives. Both state and institutional capacity to implement policy directives was given scant emphasis. The ramifications for endorsing political expediency continue to stifle transformation endeavours.

When Minister Angie Motshekga announced the 2014 Annual National Assessment (ANA) results, deeper systemic challenges were reflected through poor learner performance across grades. South Africa's poor learner perfor-

mance also applies to local assessment tests. For instance, the 2011 Annual National Assessments (ANA) for grades 1 to 6 confirm that 'In Grades 3, the national average performance in Literacy stands at 35 per cent. In Numeracy our learners are performing at an average of 28 per cent. Provincial performances in these two areas is between 19 per cent and 43 per cent, the highest being the Western Cape, and the lowest being Mpumalanga'. Furthermore, the sixth graders' 'national average performance in Languages is 28 per cent. For Mathematics the average performance is 30 per cent. Provincial performance in these two areas ranges between 20 and 41 per cent, the highest being the Western Cape and the lowest being Mpumalanga. Reflecting on below par performance, Minister Motshekga reminds us that 'to improve the quality of our education – classroom teaching must improve so that learners can receive quality knowledge at the requisite level'.

South Africa's performance in international assessment tests such as the Trends in International Mathematics and Science Study (TIMSS) is of great concern. Our fifteen-year-olds lag requisite proficiency in literacy and numeracy when compared with top performing nations like Finland and Singapore. Learner performance is dialectically linked to the state's management of educational activities in terms of resource allocation, distribution and utilization. Most developing nations struggle with infrastructure backlogs, politically hostile learning environments due to teacher union activities and poorly aligned policies and implementation and monitoring mechanisms. South Africa still grapples with these challenges.

Failure to manage curriculum changes and operational interfaces may impact on learner throughput and enrolment at tertiary institutions for higher studies. Low university enrolments diminish the creation of a stable human capacity development value chain. It also accentuates youth unemployment and depletion of the fiscus. Fullan (1993: 84) avers that 'learning organizations are a part of a greater complexity that requires a holistic view to survive and develop'.

Fullan's (1993, 2009) views resonate with South Africa's political transition and ability to understand contextual factors and concomitant change drivers. An over-zealous proliferation of education policies ignored the OECD Education Policy Outlook 2015: Making Reforms Happen, which sets out 'investing in teaching and teachers; setting high standards for all students and using data to follow student progress'.

Regrettably, South Africa has institutionalized a very low pass mark requirement for grade 12 learners. For instance, a learner must achieve '40 percent in home language, 40 percent in two other subjects, and 30 percent in three subjects'. Monyooe et al. (2014: 185) argue that South Africa's practice

does not favourably compare with continental practices where the minimum pass rate is set at 50 per cent. It suffices to observe that political expediency has led to a deviation from international performance norms and benchmarks.

While setting low pass requirements may resonate with public sentiments in terms of creating an opportunity for increased grade 12 passes, it however, has serious long term consequences for academic progression in higher education institutions. Low numbers of eligible students enrolling at tertiary institutions undercuts future research development trajectories and human capacity development endeavours. South Africa needs a balanced and effective plan to improve learning ecologies for the future. The ants' metaphor may provide valuable lessons for interventions.

The ants' successful plan to cross the Amazon River was anchored on sound organizational principles such as a culture of shared responsibility, commitment to vision, intelligent use of change management skills, and a passion to transcend into the unknown with confidence. Lapses in organizational leadership have compounded systemic deficiencies and undermined efforts to promote sustainable learning ecologies and quality education. South Africa's inability to create what Leclerc et al. (2012: 2) term 'a set of social relations that create a culture of shared responsibility' has further accentuated the challenge. To circumvent organizational deficiencies from spiralling out of control, learning ecologies must be staffed with courageous and visionary leadership that comprehends the chasms of rethinking and transforming learning ecologies into sustainable spaces for scholastic excellence. South Africa needs to invest substantially in organizational human development, if it is to compete with top performing nations.

Another metaphor that resonates with educational transformation discourse is what Smith (2005) terms the 'London Tube', commonly known as 'Underground trains' in Britain. The London Tube is acclaimed for its ability to connect different cities, its efficiency as a mode of transportation, its reliability, and for inspiring new ventures. In addition to providing multiple entries and exists, the London Tube has a unique inscription (warning) on all the platforms – 'Mind the Gap'. This is a space between the train and platform, where no human beings should be when the train pulls out, lest they lose their legs.

The 'London Tube' metaphor shares facets of a well-organized and successful education system that offers citizenry multiple and fulfilling opportunities. Through the London Tube, citizenry criss-cross geo-city borders with utmost ease and in real time. Regrettably, South Africa's educational provisioning does not match the savviness of the London Tube in many respects, for instance, the inherent disconnect between the official curriculum and its requisite responsiveness (educational goals). South Africa's approach to educational

transformation and policy overzealousness, has failed to robustly engage the 'Mind the Gap' conundrum created by policy proliferation and ineffective implementation strategies (Darling-Hammond 2010; Sahlberg 2011; Hopkins 2007; Monyooe 2005). While the 'Mind the Gap' inscription on the London Tube continually flares the passengers to affirm dangers lurking should they misstep when boarding the trains, South Africa has not sufficiently paid attention to the system's flares of deficiencies.

South Africa's socio-economic history underlines another 'Mind the Gap' challenge, namely, disparities between rural and urban contexts. Poorly developed rural and urban contexts influence quality education and socio-economic livelihoods. As reported in the 2014–2015 Global Competitiveness Report, agile economies influence development and allow states to invest substantially in education. Economic stability allows for better management of governance structures.

Consequently, in the same way nature self-regulates to maintain ecological equilibrium and sustainable biodiversity, learning ecologies require robust entropy to match the twenty-first century technological imperatives. South Africa needs to invest substantially in social justice to address historical and systemic imbalances. Part of the approach should be to counter Bolin's (1989: 88) warning that 'Schools will never change as long as teachers clock in and out of school without thought of what it is they are trying to accomplish. Teachers who aspire for excellence in teaching and expect excellence from students are concerned about their craft'. Failure to redefine educational obligations will undermine envisaged transformation endeavours.

In a nutshell, the three metaphors used in the article communicate one powerful message, namely that strategic organizational changes are vision driven, anchored on robust research intelligence and shared responsibility. South Africa needs a more coherent approach to turn school environments into sustainable learning ecologies.

Engaging Learning Ecologies: Whose Narratives Matter the Most?

When President Zuma declared education the 'apex of government', this changed and invoked nuanced narratives about education. It created a platform to interrogate South Africa's capacity to provide quality education and sustain international competitiveness. The declaration also raised public expectations about learner performance and achievement given South Africa's dismal performance in international assessment studies (TIIMSS). Regrettably, the presidential declaration has not turned schools into competitive learning ecologies as evidenced by results and performance at matriculation and across grades.

The need to transform schools into hubs for excellence is aptly captured by *The Economist* (2014: 55) which posited that 'Education ministers across the globe quake in the run-up to the publication, every three years, of the OCED's International Student Assessment (PISA), which rates 15 year-olds academic performance in dozen countries'. South Africa tends to favour political expediency over robust international benchmarking regimes. In an article entitled 'Preschool quick fix sets bar too low', I have argued that:

> [ext] Political narratives tend to obfuscate the vital connections and empirical evidence that underpin the optimal implementation of envisaged policy changes. The lofty promises the manifesto enunciated lack important details on the kinds of strategic processes and modalities that would need to be deployed if specific outputs and milestones are to be tangibly achieved. (Monyooe 2014) [ends]

A more coherent approach would unravel inherent organizational chasms, and create an efficacious educational system.

There are potentially five possible narratives that underpin discussion on learning ecologies and performance, namely (a) official, (b) public, (c) critique, (d) 'lived', and (e) silent/unamplified narratives. The epistemological essence of these narratives is summarized as follows:

a) *Official narratives* – represent deftly crafted statements of approval by the officialdom in recognition of the system's performance. When the Minister of Basic Education described the 2013 matric national pass rate of 78.2 per cent as an 'exceptional performance over the years', it glossed over what Ayers (2010) terms 'yeasty' nuggets about the quality of results and the system's efficacy. South Africa's tendency to prioritize political expediency over stringent quality regimes undermines the ideals Mandela implored the citizenry to embrace in his address to parliament.
b) *Public narratives* – take cue from official announcements and tend to embrace sectorial celebrations without interrogating uncomfortable nuggets of the system. The stage-managed like reactions often obfuscate systemic deficiencies such as learners dropping out of the school system.
c) *Critique narratives* – represent robust and holistic analysis of learner performance and the system's efficacy. The critique approach to educational issues allows for robust interrogation of the deeper layering of the system.

d) 'Lived' narratives – represent the actual educational experiences (stories) as lived by learners, teachers and other relevant stakeholders. Documentation of these personal data offers possibilities and insights to crucial nuggets of the system for future planning. As Fredrickson (1997: 12) opined, 'We all have stories to tell. In times past, people seemed to understand that stories are the way we make sense of our lives, pass long knowledge and traditions'. The 'lived' educational narratives in real time unmask those salient aspects of the system that the officialdom tends to censure from the rigours of public discourse.
South Africa commemorates National Youth Day (16 June) every year in recognition of the valiant school children that challenged the apartheid regime. The young lions of the 1976 uprisings were an epitome of fearless commitment against the most brutal regime. The brazen acts of apartheid forces could not break their resolve to protest the imposition of Afrikaans as the medium of instruction. Unlike the renowned engineers that designed the greatest wonders of the world (bridges, skyscrapers, medical technologies), theirs was a unique engineering of the mind couched in the doctrines of Pan-Africanism, Black Consciousness and so on. Their narratives were about reclaiming their bona fides. That definitive walk down the streets of Soweto which culminated in the death of Hector Pieterson has been immortalized for generations.
The current cohort of students lacks that effervescent passion and commitment to amplify the diversity of student needs. The downward spiralling of learner performance both in national and international assessment tests has not rekindled the valiant foresight that drove the 1976 young lions to march down the street to affirm their rights. It would seem that the democratic transition has created a *laissez-faire* mentality towards the provisioning of quality education, even when the deficiencies are so glaring.

e) Silent – unamplified narratives – represent well-considered views by disillusioned stakeholders about educational issues. The silent narratives often bear 'bleeding' scars from somewhat intolerant governments. To avoid the wrath of officialdom, silent narratives embrace reclusion and consign their unamplified narratives to footnotes about educational systems that are often missed by officialdom.

Creating spaces for critical thinking allows systems to interrogate those uncomfortable elements about quality and efficacy. It also allows for meaningful calibration of perspectives on efficacious modalities to create sustainable learning ecologies for South Africa.

Proliferation of Policies and Implementation Conundrum

The South African Constitution (Act 108 of 1996) under Section 29 (1) boldly states that every person has the right to: (a) a basic education, including adult basic education, and (b) further education, which the state, through reasonable measures, must make progressively available and accessible. It further commits the government to uphold the principles of equality and non-discrimination across the education sector. To realize constitutional directives, South Africa has invested substantially in the policy formulations envisaged to deepen democracy.

Educationally, South Africa boasts policies such as the Education White Paper 1 on Education and Training (1996); Higher Education Act (1997); South African Schools Act (1997); Adult Basic Education and Training Act (2000); National Policy on Whole School Improvement (2001); Revised National Curriculum Statement Grades R–9 (2001), to mention but a few. Over the years, new policies such as the Action Plan to 2014: Towards Realisation of Schooling 2025; Plan action – improving access to free and quality basic education for all (2003); the Delivery Agreement for Basic Education Sector (2010) and the National Development Plan 2030 have come off the policy production line without much success.

It is envisaged that the policies alluded to above will fulfil three constitutional principles, namely to heal the divisions of the past and establish a society based on democratic values, social justice and fundamental human rights; improve the quality of life of all citizens and free the potential of each person; and lay the foundation for a democratic and open society in which government is based on the will of the people and every citizen is equally protected by the law. While incremental success is noticeable, the proverbial 'elephant in the room', is South Africa's inability to translate policies into tangible transformation gains that improve sustainable learning ecologies.

Proliferation of policies is not a reliable indicator for transformation successes as it obfuscates reality about the system's efficacy and performance quality. A policy weakness in the South African context, is the noticeable disconnect between policy directives and implementation strategies. Mismatches between policy directives and implementation are not uniquely peculiar to South African. Harris (2000: 1) argues that:

> [ext] In most Western countries the pressure for change has manifested itself through government policies aimed at generating the impetus for school development. In reality, however, such policies have often proved counter-productive to innovation and change. The current dichotomy facing schools is one of greater central accountability and control, with an increased responsibility for self-management and development. [ends]

Harris's postulations resonate with South Africa's educational challenges post-1994. While policies have numerically tripled, they have not led to substantive gains in terms of the system's efficacy and quality. Twenty years on, South Africa's educational performance in international assessments studies remains dismal despite an avalanche of formulated policies. Internationally, Finland is among a small percentage of countries that have successfully integrated policy and implementation strategies. Consequently, Sahlberg (2011: 39) writes that:

> [ext] The key success factor in Finland's development of a well-performing economy with good governance and a respected education system has been its ability to reach broad consensus on major issues concerning future directions for Finland as a nation… Educational policies that are based on the ideal of equal educational opportunities and that have brought teachers to the core of educational opportunities have positively impacted the quality of learning outcomes. [ends]

In order for South Africa to transform learning ecologies into the mould of the Finnish system, robust paradigm shifts at policy and praxis levels must prevail. This view is also supported by Christie (1997) who writes that 'change [should] not only [be] in relation to shifts from one state to another, but also in terms of engaging with practices and rationalities of government in a continuing process'. A requisite paradigm shift must also be underpinned by what Darling-Hammond and Wentworth (2010: 3) term 'intensive investments in teacher education and major overhaul of curriculum and assessment system'.

The literature on educational transformation advocates a more balanced infusion of interventions that substantially enhance the system's efficacy and quality (Sahlberg 2011; Darling-Hammond 1994; Darling-Hammond and Wentworth 2010). South Africa's ability to manage competing demands at the National Treasury in terms of equitable resourcing might just unlock the jam of systemic deficiencies and unleash possibilities for enhanced and sustainable learning ecologies.

Proliferation of policies is not a reliable indicator of system's efficacy and quality of service provided. If that were the case, South Africa, given its litany of policies, would have radically changed learning ecologies into competitive hubs for breaching knowledge boundaries. South Africa's performance in international assessments studies and tests would be comparable with top performing nations.

Building Bridges for Sustainable Rural-urban Learning Ecologies

The notion 'from cradle to grave' invokes key principles about the genesis and sustainability of entities such as ecology, infrastructure and other creations that dominate human lives. These entities rely on the application of entropy as a physics principle to affirm existence and sustainability. It is an intelligent calibration of requisite pillars into versatile entities of national significance. Commenting on the processes of bridge construction, Monyooe (2012: 2) writes:

> [ext] When geotechnical engineers construct bridges, they spend enormous time on design and foundation (piling, drilled shafts, spread footing, aerodynamics, cables and so on) to ensure that the bridges are quality-assured. When deciding where to construct a bridge, the engineers must reflect on the environmental impact, natural hazard mitigation, economic efficiency and sustainability. (Monyooe 2012) [ends]

The same way geotechnical engineers plan connecting cities through bridges and rolling out meticulous and research driven operations that enhance life and global competitiveness, curriculum planners go through an arduous interrogation of feasibility studies (data) to decipher plausible curriculum models that resonate for instance, with South Africa's ecologies.

The often slow-paced approach to educational transformation has not fully connected rural and urban ecologies to versatile educational nodes linked to sustainable livelihoods. Unlike the state-of-the-art bridges created across the globe that effortlessly connect geo-cities, the South African education system has not attained its national mandate, for instance, learners' rights to quality education and infrastructure have been severely compromised.

The dastardly conditions under which some learners are taught are aptly delineated by Monyooe (2014: 58–60) in a poem entitled 'A Classroom':

> [ext] *Yes that's me*
> *The now dilapidated structure you call school*
> *I once had soul and integrity*
> *I had best and worst of times*
> *The torturous lifestyle that left me bloody scarred*
> *I remain dilapidated and hollow*
> *I can only reminisce at the youthful years gone by*
> *The once exquisite interior designs have gone to waste*
> *Hollow, sullen and soulless*
> *I am physically embarrassed to accommodate the inquisitive minds*

The colourful decorations that adored the walls have gone amiss
Leaving only remnants of once comfortable space
The chairs and desks have metamorphosed into hardened wood
Gnawed by decades of torturous forces of nature
I am though, in sync with nature
Like twins we cuddle for affection
Every rain drop drowns my zillion sorrows of inadequacy
I have lost the spark to challenge the young minds in my care
That's me, a dilapidated and hollow space called classroom
Whenever rain touches our hood
I get drenched and metamorphose into puddles
And the young minds that reside with me scatter for safety. [ends]

The interrogative discourse that foregrounds bridge construction processes shares robustness that can be deployed to re-engineer education and create sustainable learning ecologies. Insightful analysis of cohorts of research data allows educational planners an opportunity to calibrate an efficacious system that connects and challenges learners to breach knowledge boundaries.

The use of bridge construction as a metaphor to unravel the chasms of educational change and transformation serves many purposes. Firstly, at the intellectual level, it affords us the much needed transcendental engagement with deeper conceptual theorizations about transformation and how its modalities can be harnessed to turn schools into sustainable ecologies. Secondly, at the operational level, it allows for the coalescence of ideas into tangible and functional plans that can transform ordinary bridge pilings, shafts, cables and so on into awesome bridges that give sense to geo-space. And thirdly, it also allows for robust analysis and validation of the plausibility of the envisaged transformation interventions. In this way, the 'Mind the Gap' conundrum alluded to by Smith (2005) would have been sufficiently interrogated and addressed.

Creating sustainable learning ecologies goes beyond curriculum changes and infrastructural development. It should incorporate classroom narratives that form the daily teacher-learner interface and the often taken-for-granted delivery of curriculum and embedded assessment methodologies. Consequently, Ayers (2010) writes that learning environments should be 'inviting spaces for critical thinking' where learners unravel official curriculum. Ayers' (2010) postulations resonate with critical pedagogy discourse robustly embedded in the authoritative writings by Giroux and McLaren (2004), Giroux (2003), Knight and Collins (2010) and Waghid (2004).

Critical discourse encourages the transformation of learning ecologies into sites of critical engagement and questioning of the curriculum to unravel

deeper elements of the system in terms of national responsiveness. South Africa's incremental gains achieved through educational transformation have not fully been embedded to develop graduates with sufficient skills to penetrate the knowledge economy.

Furthermore, South Africa's systemic imbalances described above undermine what Ayers (2010) terms the requisite role of schools as 'laboratories for discovery and surprise, spaces where children can be active'. Consequently, Smolleck and Nordgren (2014: 2) write that 'Allowing students to be inquisitive within their learning provide experiences that are memorable as well as educational'. In addition to sound educational policies, South Africa needs entropy for infrastructural development to transform learning ecologies into what Ayers (2010) terms 'inviting spaces' for quality education where teachers 'teach to make a difference'. The presence of mind and intelligent integration of engineering skills led to the construction of the engineering wonders of the world – Africa's pyramids, the Taj Mahal in India, and Kansai airport in Japan. These engineering marvels were anchored on quality education and solid engineering skills.

South Africa's endeavours to transform rural and urban learning ecologies can be attained through an eight point strategy summarized below.

Political Will and Decisiveness

Top-performing nations perceive education as a key driver to economic development and often match this view with requisite resources to penetrate the knowledge economy. Policy directives without a firm political goal remain mere rhetoric unless they are fully integrated into the locus of power and decision making. Political will goes beyond political rhetoric and should be anchored on firm strategic investments. South Africa must transcend the policy proliferation phase and focus on refining implementation strategies.

Civic Engagement and Advocacy

Creating vibrant social engagement and robust articulation of educational issues deepens public commitment to social justice endeavours and creates what Armaline (2010: 159) terms 'Civic and political engagement [that] becomes something immediately relevant, rather than an alien practice only understood and realized at adulthood'. South Africa's approach to transformation is heavily reliant on bureaucratic and technocratic principles with limited success and this creates disconnect between policy directives and reality (implementation). Civic engagement gives credence to what Armaline (2010: 160) terms as 'having some significant stake, and meaningful voice'.

Accountable Leadership

Darling-Hammond (2010) reminds us that effective leadership demonstrates accountability through effective systems that recognize collaborative partnerships. Such partnerships engender a culture of high-quality performance by all the stakeholders through an agreed performance matrix. Values of meritocracy are engendered across the system and continually monitored for sustainability.

Staffing Schools with Professionally Qualified Teachers

Deploying highly qualified personnel to manage learning ecologies can counter Bolin's (1989: 88) notion that 'Schools will not change as long as teachers clock in and out of the school without thought of what it is they are trying to accomplish. Teachers who aspire for excellence in teaching are concerned about their craft'. Elsewhere, Monyooe et al. (2014: 187) write that 'In Finland, teaching is a high premium profession because of stringent recruitment, selection criteria and teacher education programmes'. A view which is further emboldened by Sahlberg (2011: 125) who writes that the Finnish educational successes emanate from 'well-prepared teachers, pedagogically designed schools, good school principals'.

Creating Versatile Internal Governance Structures

Managing educational institutions has evolved with notable complexity which puts a strain on school internal governance structures. Consequently, Dankelman (2003: 17) writes,

> [ext] [g]ood governance not only includes transparency, democracy and respect for human rights, institutional capacity and resources, but it also has major gender implications. Among these are equal participation of women at all levels, their access to education, training, employment and benefits… Gender mainstreaming is not simply a question of women in decision making… It also means that institutional mandates, policies and actions are shaped by gender perspectives. [ends]

Performance variances across learners' grades reflect deeper administrative and governance challenges within the system. The current South African School Governing Bodies (SGBs) need further upskilling to meet complex governance issues. The literature (Darling-Hammond 2010; Sahlberg 2011) confirms that schools entrusted to well-qualified teachers and administrators perform better in academic and related activities.

Managing Highly Unionized Learning Ecologies

The South African education landscape has fundamentally changed in terms of union activities. According to Letseka et al. (2012: 1197) teacher unionization in South Africa has stronger links with political affiliations, for instance:

> [ext] The largest union, the South African Democratic Teachers Union (SADTU) is affiliated to the Congress of South African Trade Union (COSATU). The latter is a partner in the ruling tripartite alliance that includes the National African Congress (ANC) and the South African Communist Party (SACP). World-wide public-sector unions are known to prop up left wing political organizations. SADTU is no exception. [ends]

While labour laws allow workers to unionize, it is the union's modus operandi that attracts negativity, particularly when such alliances lead to unintended consequences such as undermining the quality of education through disruptive acts. Consequently, Monyooe et al. (2014: 190) argue that 'unionized teachers in South Africa spent far less time teaching learners than their international counterparts'. Literature suggests that successful educational systems have managed to create a balance between teachers' occupational requisites and obligations to provide quality education (Ayers 2010; Hargreaves and Fink 2004; Darling-Hammond and Sykes 2003; Heystek and Lethoko 2001). South Africa needs to explore international trends on the harmonization of alliance politics and quality education. Unless sustainable solutions are found to improve teachers' occupational conditions, industrial actions (strikes) will continue to undermine quality education, particularly rural-based learning ecologies.

Creating Versatile Learning Ecologies

According to Darling-Hammond and Wentworth (2010: 2) quality of education involves an application of 'project-based, inquiry-oriented learning… mapped to syllabus' that allows learners to explore knowledge boundaries. A view supported by Smolleck and Nordgren (2014: 4) who remind us that 'Children are innately inquisitive about the world around them; therefore, allowing children to investigate their own questions instils a lasting love of learning. Inquiry gives students the ability to find answers, which gives them a sense of empowerment in their learning'.

Consequently, Armaline (2010: 151) writes:

> [ext] …in order to build sustainable democratic societies and communities, pedagogical space must be created and protected where students and teachers might safely engage with democratic concepts and praxis. [ends]

Forging Strategic Partnerships for Poverty Eradication

Rural learning environments continue to experience bald inequalities in terms of access, quality and infrastructure. Although the Education White Paper 6 (2001: 5) boldly promised to 'enable all learners to participate actively in the education process so that they could develop and extend their potential and participate as equal members of the society', regrettably, this undertaking remains a distant dream for some children in South Africa. Providing access to quality education remains a huge challenge that must be negotiated with the National Treasury in terms of prioritizing developmental interventions.

Evidence gleaned from the Global Competitiveness Report 2014–2015 indicates that developing nations can leverage more successes if they invest aggressively in infrastructure development and technology advancement. Partnerships between higher education institutions and the private sector can contribute towards creating sustainable learning ecologies that have the capacity to enhance South Africa's competitiveness in spheres of knowledge economy.

Leveraging Higher Education Expertise to Transform Learning Ecologies

South Africa's higher education sector comprises twenty-three public universities, eighty-seven registered private higher education institutions and thirty-one provisionally registered institutions, and two national institutes of higher education and science councils. All are tasked with enhancing the quality of higher education provisioning and social development. Transforming learning ecologies is a partnership project that requires versatile leadership, intelligent fusion of policies and actionable implementation mechanisms. Strategic leveraging of higher education expertise (governance, research, teaching methodologies etc.) has the potential to influence the trajectories of changing learning ecologies. The interface between the higher education sector and basic education must be strengthened to collaborate more on areas of interest.

South Africa's Education White Paper 3: A Programme for the Transformation of Higher Education (2007) lists amongst its objectives a commitment to 'deliver research and human capital'. Universities and independent agencies prepare and train teachers for South African schools. The basic education department offers bursaries for eligible students through the Funza Lushaka Bursary Scheme. The Funza Lushaka aligned curriculum is limited in scope

because it covers for instance orientation to the curriculum and assessment policy (CAPS), short course interventions, and qualification-programme and unit standard interventions.

The success of these partnerships depends largely on revamping current teacher training and development programmes to infuse new trends in teacher education for the twenty-first century. We could draw valuable lessons from the Finnish education system that requires all teachers to possess a masters' degree to be licenced to teach across grades. According to Darling-Hammond and Wentworth (2003: 2) 'Qualified teachers are a critical national resource that requires federal investment and cross-state coordination'.

In her attempt to redefine the transformation agenda, South Africa has adopted a National Development Plan 2030 (Vision 2030), with the following key objectives for education:

- high quality, universal, early childhood education
- quality school education, with globally competitive literacy and numeracy standards
- further and higher education and training that enables people to fulfil their potential
- an expanding higher education sector that can contribute to rising incomes, higher productivity and the shift to a more knowledge-intensity economy
- a wider system of innovation that links universities, science councils and other research and development players with priority areas of the economy (p. 38).

The plan sends the right messages that resonate with public perspectives. If the plan were to be executed intelligently, it would translate the somewhat lofty objectives into tangibles. Similarly, provisioning of quality higher education would contribute towards the training and development of qualified teachers and education administrators that would manage and capacitate learning ecologies. Well-resourced learning ecologies improve learner performance and fulfil what Ayers terms 'inviting spaces' that change human lives for a sustainable future. South Africa needs a knowledgeable workforce to harness opportunities presented by the knowledge economy.

Conclusion

Historical and systemic imbalances remain South Africa's achilles heel across all sectors of governance. The education sector, especially in rural and urban settings is characterized by poorly resourced learning ecologies that compro-

mise good policy formulations. There is a lack of state of the art classroom infrastructure and deployment of well qualified teachers to manage learning ecologies to contribute to national mandates. The current policy proliferation, regrettably, does not match or correlate with learners' performance across grades. South Africa's performance in international assessment tests has been dismal which was also the case in national tests as evidenced by poor numeral skills and competences by grade 9 learners who were assessed through the Annual National Assessments (ANA) tests in 2014. The below par educational performance across grades and the setting of low performance requirements for passing grade 12 impact on the future human capacity development value chain and our ability to compete in knowledge economies.

Perhaps, through critical narratives and/or engagement, South Africa would find meaningful balance between policy frameworks and implementation mechanisms. Strategic interventions would equally harmonize socio-economic gaps and encourage partnerships for social justice. Through a shared vision and versatile collaborations, South Africa's learning ecologies would be transformed to match international norms and benchmarks (skill sets) for sustainable education and economic development.

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Improving the Quality of Education among Rural Learners through the Use of Open and Flexible Approaches in Lesotho's Secondary Schools

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Abstract

Despite gains made in the past two decades in improving access rates, learners in Lesotho continue to suffer from high dropout rates at primary level and poor access rates at secondary level, particularly in the rural areas. This paper draws on the findings from an intervention aimed at identifying and overcoming entrenched patterns of educational inequality and disadvantage among Basotho learners and exploring what can be done about the poor completion rates in particular. The findings show important real and potential benefits arising from the use of open, distance and flexible learning for reversing the interruptions to schooling caused by poverty and HIV/AIDS among marginalized groups of learners in rural areas in Lesotho. Most importantly, the paper demonstrates the sustainability of affordable initiatives in terms of improving the quality of education among rural learners through the creation of circles of support around learners at risk of dropping out of school.

Résumé

Malgré les acquis notés au cours des deux dernières décennies dans l'amélioration des taux d'accès, les apprenants au Lesotho continuent de souffrir des taux élevés d'abandon scolaire au niveau primaire et des faibles taux d'accès au niveau secondaire, en particulier dans les zones rurales. Cet article se fonde sur les résultats d'une intervention visant à identifier et surmonter les modèles établis d'inégalité scolaire et de désavantage chez les apprenants basotho et à explorer les voies et moyens pour améliorer les

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faibles taux d'achèvement en particulier. Les résultats montrent des avantages réels et potentiels importants découlant de l'utilisation d'un système d'apprentissage ouvert, à distance et flexible pour remédier aux abandons scolaires causés par la pauvreté et le VIH / SIDA parmi des groupes marginalisés d'apprenants dans les zones rurales au Lesotho. L'article démontre surtout la viabilité d'initiatives abordables en termes d'amélioration de la qualité de l'éducation chez les apprenants en milieu rural, par la création de cercles de soutien autour des apprenants à risque de décrochage scolaire.

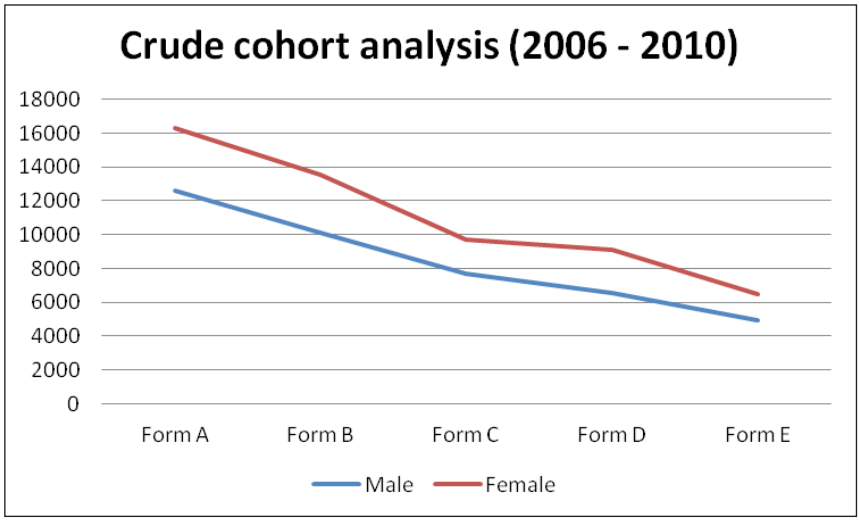
Context and Problem

While Lesotho has experienced commendable progress towards opening up access to primary schooling since the introduction of Free Primary Education (FPE) in 2000, rural learners continue to experience poor access and inequitable provision of education. In general, secondary education remains highly inaccessible in Lesotho, with almost two-thirds (63.5 per cent) of children of secondary school-going age being out of school (Ministry of Education and Training 2012). Lack of space and high school fees have been cited as serious constraints on education provision at secondary level (Lerotholi 2001), and the situation is significantly worse in rural areas. For example, a survey conducted in 2002 reported access rates for children in the rural areas to be as low as 23 per cent, more than 10 per cent lower than their urban-based compatriots (Bureau of Statistics 2002). Also, while initiatives such as the bursary scheme for orphaned secondary school children have partially improved access for orphaned and vulnerable children (Smiley 2011), rural secondary learners have not benefitted from any programme (Nyabanyaba 2009).

In addition to the general situation of HIV/AIDS, Lesotho being one of the worst-affected countries in the world (UNICEF 2007), the survey conducted by the Bureau of Statistics (2002) further confirmed that communities in rural areas experienced significantly harsher poverty and worse service delivery. In these harsh circumstances, practices that disrupt rural children's schooling include one such practice where children are hired out to more affluent families and boys in particular are called upon to alternate going to school with other siblings in order to look after animals (Nyabanyaba 2009). In addition, there is a growing practice where girls experience serious disruptions to their schooling as a result of HIV/AIDS, often having to attend to sick members of the family or younger siblings orphaned by AIDS (Kimane and Mturi 2001). These disruptions are all the more pronounced by cultural practices that persist in rural areas, where each member of the family is expected to play his or her part in carrying out family responsibilities.

The impact of the disruptions experienced by secondary learners is illustrated by the cohort analysis presented in Figure 1.

Figure 1: Secondary School Cohort Trends



It might also be noted that although girls start off at a significant advantage to boys upon entry into secondary school, their completion rates are poorer than those of boys, and their enrolments become even more vulnerable in Form C and Form E. Form C and Form E are external examination classes, which means that girls tend to be pulled out or drop out of school in the years when examination fees add to the burden of tuition that has already been shown to be quite high at secondary level (Nyabanyaba 2009). In simple terms, Lesotho has a serious problem with not just attracting learners into secondary schools but also in efficiently guiding them into the final year of study, a situation that evidently grows worse in rural areas.

Theoretical Issues

The rural community in Lesotho constitutes over 70 per cent of the entire population and is yet the most marginalized in relation to services. While data on the status of rural communities in Lesotho and many countries is in abundance, 'rurality' as a social construct has only recently received significant attention. Over the past few decades, there has been an emergence of considerations for rural communities as a unique space requiring distinct social interventions and research approaches that highlight the rural educational context rather than merely measuring it (Clark and Zimmerman 2000). Atkin (2003: 507) recommends the use of an anthropological definition of rurality that considers the

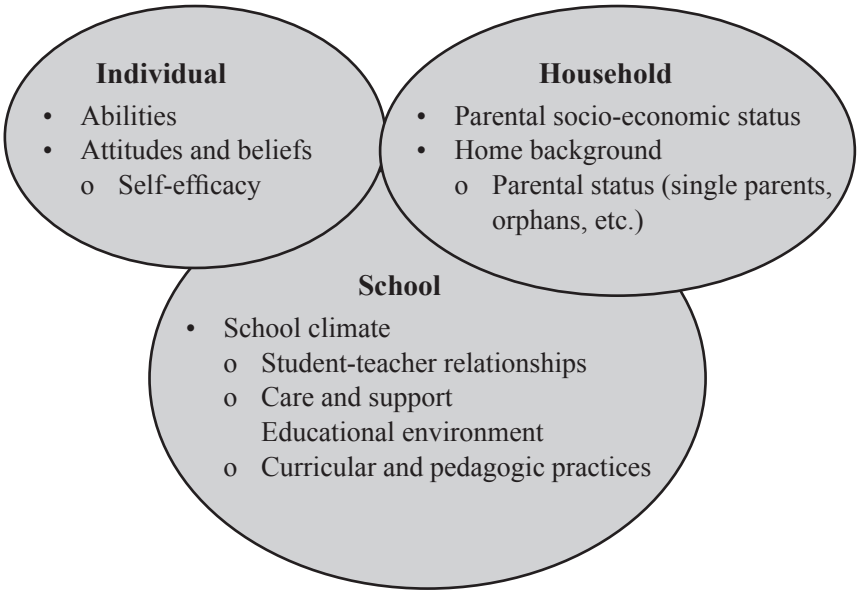
identity of rural communities. Such an anthropological consideration would enhance an understanding of the context that shapes the attitudes, behaviour and beliefs of the participants.

Theorizing rural learning ecology was a critical aspect of understanding the context which mediated the intervention. Particularly, framing rurality as not lesser but as critical, and recognizing the urgency based on divergence rather than convergence were seen as central to enabling a deeper understanding of the complex, rather than deficient, nature of rural communities as they interact with education initiatives. It is important to note that theorizing and researching rural education is a growing focus of an initiative driven by the University of the Free State and has resulted in some important empirical studies that highlight the plight of rural education in developing countries such as South Africa (Tsotetsi 2013). Sustainable learning environments promote the creation of learning space within both formal classrooms and community environments (Mahlomaholo 2012: 5). This growing understanding of the potentials and constraints within which rural education is located is critical to a more nuanced understanding of emerging issues within the rural context.

Within this consideration of rurality as a distinct social construct, the ecological systems framework has been drawn upon to comprehend the multiplicity of contextual influences that impact on human development and behaviour such as access and participation in school (Bronfenbrenner and Morris 1998; Conger and Elder 1994; Scaramella and Keyes 2001). These multiple contexts include characteristics inherent to the individual as well as family, peer, school and community settings that influence individual development (Bronfenbrenner 1979). Using the ecological systems approach has been demonstrated to illuminate how individuals perceive various contexts that influence their performance (Bronfenbrenner 1976). This approach is particularly suited to an implementation of initiatives and nuanced study of their impacts in complex rural contexts such as Lesotho's, with their very intricate combination of difficult terrain, growing incidence of poverty and HIV/AIDS, as well as an intricate array of cultural practices.

Demi, Coleman-Jensen and Snyder (2010: 2) have previously drawn on the ecological framework of Bronfenbrenner (1979) that emphasises multiple contextual factors within family, peers, and school and community settings to examine students' enrolments in a rural location. This framework was adopted and modelled in Figure 2.

Figure 2: Ecological Framework Adopted



Family contexts have been shown to play a critical role in the enrolment and participation of children in school. This is not only because family context can provide financial and material support for schooling but also because they have the capacity to provide a positive environment for learning, often by creating high expectations for children's schooling (Davis-Keane 2005; Melby et al. 2008). In particular, Melby et al. (2008) argue that the home factor is not only about families' ability to afford fees, which is a key factor at secondary level in Lesotho, but also that providing a positive environment and family relationships, including parents bonding with their children, is essential.

Schools have also been found to play a pivotal role in attracting and retaining enrolments and participation in schools. Key factors that have been found to be central to successful schools include positive student-teacher relationships and high expectations of teachers regarding their students' capacity to succeed. In fact, Demi, Coleman-Jensen and Snyder (2010) found a much weaker association between family factors and enrolments, than between

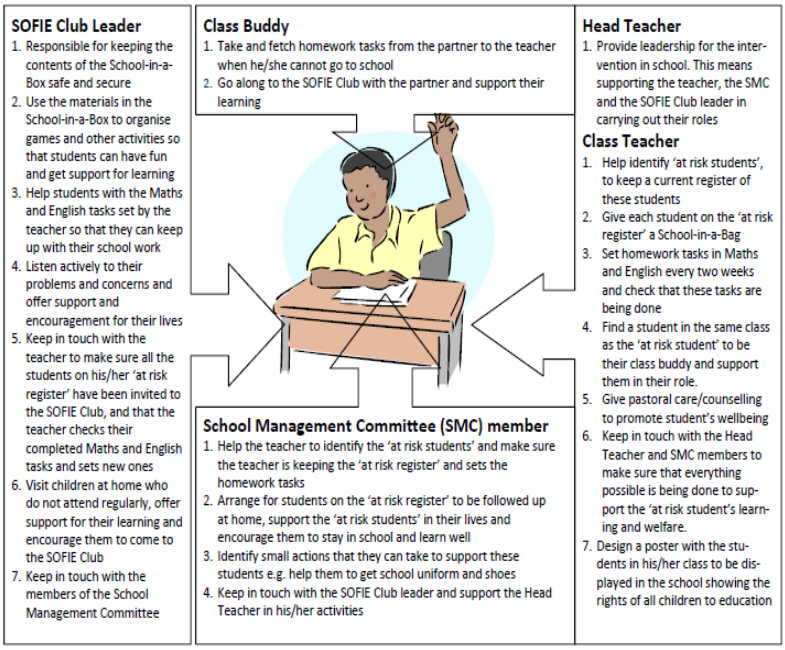
school climate and enrolments, thus highlighting the importance of a positive school climate in rural contexts. Individual characteristics such as self-efficacy have been established as important predictors of achievement and retention and are known to also raise students' aspirations to apply more effort and to study further (Bandura 2001). It is important to note that these factors are not necessarily discrete but are often interrelated in an intricate manner, often with a strong family lead, resulting in strong individual character.

Intervention

A collaborative team of educators from the University of Malawi's Centre for Education Research and Training, the Institute of Education in London, the South African Institute of Distance Education, and the National University of Lesotho's Institute of Education came up with a low-cost initiative to address the problem of poor access and efficiency rates among children in rural areas of Lesotho in a context of poverty and high HIV prevalence rates. The model was driven by research that showed that open, distance and flexible learning (ODFL) has the means of reducing social inequalities and improving inclusiveness in education (Unterhalter, Hoppers and Hoppers 2000; Pridmore and Yates 2006). Another key approach to the initiative was the creation of a 'circle of support' made up of peers, members of the family and the community that has been implemented in primary and secondary schools in Botswana and Namibia (Pridmore and Jere 2011). The concept of a circle of support was drawn upon to create ecologies aimed at sustaining the initiative through typical cultural practices that persist in rural Lesotho where young people come together to support one another, under the supervision of an elder.[1]

The children who are referred to as 'at-risk' were identified through a variety of out-of-school factors such as the status of the family, including whether both parents were alive and working, and in-school factors such as attendance and performance record. The model is based on circles of support formed around pupils identified as being at risk of falling behind or dropping out of school (Pridmore 2009).

Figure 3: SOFIE Model



Each at-risk learner received a 'school-in-a-bag' with basic stationery, including a set of mathematical instruments, pens and notebooks. Wrap-around self-study guides for English and Mathematics were developed by a group of volunteer learners at the Institute of Education in London under the training and supervision of project staff, with some input from the Institute of Education at the National University of Lesotho. These guides were designed to encourage independent learning and to support continued access to learning for those vulnerable children whose attendance at school was often erratic. When such children were facing difficulties in getting to class, they could continue their studies using the guides, which were linked to the national curriculum. Mentor learners ('buddies') were recruited to support at-risk learners by acting as a link to the schools. They would provide peer support for learning, follow-up in cases of absence and, if required, carry self-study guides to class teachers for marking.

Clubs were also formed. These clubs were run by club leaders with the support of the club teacher and were monitored by local community leaders. The purpose of the clubs was to provide additional learning opportunities

and support outside of school, in a friendly and informal environment. Clubs were open to both at-risk learners and their buddies. The timing of the clubs was designed to be flexible and was arranged after school hours at an hour and place suitable for the learners. A 'school-in-a-box' containing learning materials, supplementary readers dealing with issues relating to child rights, and an interactive HIV/AIDS board game called 'Choices and Decisions' were provided to each club (Nyabanyaba 2010).

Club teachers and community leaders were trained in psychosocial support and were introduced to the wrap-around guides. They were expected to work hand-in-hand with club leaders and community leaders to support at-risk learners. Teachers were responsible for keeping a register of all learners identified as 'at risk' and regularly monitoring their progress and participation in class activities. Community leaders were responsible for linking schools with communities and for collecting data on regional activities of schools.

Methodology

The empirical study informing this paper was part of a larger educational initiative exploring a low-cost initiative that could improve access and efficiency rates among children in a context of poverty and high HIV prevalence rates. The study employed both qualitative and quantitative approaches in two distinct phases (Creswell 2009), including a randomized control trial (RCT) set up to assess the impact of the SOFIE model on the retention and progression of vulnerable learners in Grade 9 (Form B) in targeted schools. To control the effects of factors external to the intervention on learner outcomes, a Pre-test/Post-test Control Group design was adopted, whereby twelve schools were randomly assigned to either of two groups. Data included school attendance rates, progression rates, repetition rates, dropout and completion rates. These were collected from both groups at the baseline (in November 2008) and following implementation (in November 2009), but only one group received the intervention package. The impact of the intervention was measured through the following key variables:

a) the proportion of learners in the target grade that did not drop out during the school year with learners who had not returned by the end of the year and were considered to be dropouts,
b) the proportion of learners enrolled in the target grade, who were promoted to the next grade, with promotions based on schools' individual end-of-year assessment practices,

c) the proportion of learners enrolled in the target grade who did not miss school during the school year as monitored by class teachers through official attendance registers,
d) the performance of learners in English and Mathematics in the target grade with the tests set by the project team and validated by a teacher through their subjects association.

The sample yield for learners, from whom data was collected in both intervention and control schools, is summarized in Table 1.

Table 1: Learners, by School Status (intervention/control), SOFIE Club Membership and Sex

	Intervention			
	Club Member	**Non-Club Member**	**Control**	**Total**
Female	79	778	861	1,718
Male	56	612	459	1,127
Total	135	1,390	1,320	2,845

As is generally the case in Lesotho, there were more girls than boys participating at the secondary school level. Creswell, there were also some less-than-expected findings uncovered about other features of the status of learners' participation, which are discussed in the following sections.

This quantitative data was complemented by qualitative data collected using a multiple case study approach, where one site in each of the three distinct topographical regions within rural settings was selected for in-depth interviews. The three distinct regions regarded as markedly rural in Lesotho and selected for the qualitative aspect were each situated in a foothill region, Senqu-River Valley, and a mountains area, later coded FHS, SRV and MNS respectively. Since case study research involves the study of a particular phenomenon or concern within a real-life setting, it lends itself well to situations where it may not be possible, or desirable, to distinguish the issue under investigation from its context (Yin 2003). This has important advantages for gaining insight into issues of access and participation in education, where a multiplicity of factors are likely to influence any particular child's schooling. The aim was to give

insights into the complex social phenomenon being studied, in context, and as much as possible from the perspectives of those being studied (Merriam 1988). The central focus of the qualitative aspect of the study was considering a phenomenon within a real-life setting and context (Yin 2003). As case study research works within 'bounded systems', it is important to establish the unit of analysis for the research (Yin 2003; Creswell 2009). In this study, the unit of analysis was the secondary school and its surrounding communities and parents. Within this, the sample of learners, teachers, parents and community members that participated in the research can be considered a sub-unit of analysis that is embedded within the case (Yin 2003).

A semi-structured interview process was used to explore the experiences of learners, teachers and community leaders regarding the participation and performance of learners in secondary schools. Major topics framing the interviews included the implementation of the programme, the impact (success and challenges) of the intervention on attendance, retention and progression of learners, as well as recommendations for improving the quality of education among learners.

Data Analysis

Measures of attendance, retention, educational performance and promotion were used to examine the impact of the intervention. Registers were kept for students in both the intervention and control schools to track attendance and retention. While registration records within schools were sourced to determine promotions, tests in English and Mathematics were also used both at the beginning of the intervention and at the end of the intervention in order to measure the educational achievements of the learners.

Interviews were transcribed, and codes were developed using the most common themes from the data (Glaser and Strauss 1967). The emerging themes were then refined by referring back to the theoretical framework adapted from Bronfenbrenner (1979) and subsequently used by Demi, Coleman-Jensen and Snyder (2010) to examine how the multiplicity of factors at individual, family and school levels interact to influence enrolments in a rural secondary school setting.

Impact of the Intervention

This section presents the results of the experimental design used to evaluate the SOFIE intervention, focusing on learner outcomes of retention (reducing dropout rates), promotion and attainment. The live interview transcripts cited to illustrate the intervention are marked by a code to indicate the region from where the response emerged (such as FHS, SRV or MNS). The section also

discusses additional benefits and anticipated outcomes from participants' involvement in the intervention. This is premised on the view that retention is just as important as opening up access. Key outcomes of the intervention were the reduction in dropout rates and the improvement of progression rates.

Participation and retention rates

The retention and participation rates of students were monitored by recording the dropout and absenteeism of students in both intervention and control schools, with special attention and follow-up maintained with SOFIE club members. Table 2 summarizes the dropout rates and absenteeism rates in intervention and control schools during the year of the intervention.

Table 2: Impact on Retention and Progression

ID:/School status		**S:/Dropped out from school**	**S:/Absenteeism**
Intervention	Mean	1.9725	.0065
	N	1529	1529
	Std. Deviation	.16350	.14457
Control	Mean	1.9736	.0030
	N	1324	1324
	Std. Deviation	.16049	.10993
Total	Mean	1.9730	.0049
	N	2853	2853
	Std. Deviation	.16208	.12964

No differences were found regarding the dropout rates and the absenteeism rates between learners in intervention and control schools, with absenteeism rates being somewhat higher in the intervention schools. However, it was notable that while no statistical difference could be found between the groups, club members reported virtually no absenteeism during the year of intervention.

Admittedly, the intervention had not yet made any significant difference in the participation and retention rates among students. In some communities, the failure was attributed to the persistent poverty and lack of awareness among parents. Therefore, one community member suggested increased campaigns:

> [ext] Parents here really need sensitizing, especially around the problems of children who are being taken out of school to look after animals or tend the fields. As community members, we should be campaigning more and holding meetings with parents about their children (SRV). [ends]

The statement above was confirmed by other community members in the region (SRV) who cited the inflexibility of the curriculum of schools as a particular constraint in situations where children miss school for reasons such as those highlighted by the community member and cultural practices such as initiation schools. Moreover, although clearly not across the whole intervention, there were reports of some improved participation rates even among the vulnerable, where SOFIE had successfully implemented monitoring and support structures. Teachers across the different regions described how the wrap-around feature of the study guides enabled flexible learning even around rural practices and the growing socio-economic deterioration in rural areas, which are disrupting the participation of learners in schools.

Progression and Repetitions

Data from the intervention and control schools were collected on the students' repetition rates (in Form B) and their progression to the next grade (Form C). Table 3 summarizes the findings.

Table 3: Impact on repetition and progression

		S:/repeated Form B in 2009		
		Repeated	**Progressed**	**Total**
ID:/School status	Intervention	77	1,452	1,529
	Control	60	1,264	1,324
Total		137	2,716	2,853

A lower proportion of learners progressed from Form B to Form C in the intervention schools (94.96 per cent) than in the control schools (95.47 per cent). 'However, within the intervention schools, virtually all the students (134 out of 135 or 99.26 per cent) who participated in the SOFIE clubs, and thus benefitted from the full circle of support, progressed to Form C, while 2,581 (95 per cent) of those who were not in the clubs progressed. Indeed, while there was no difference in both repetition rates and progression to Form C between intervention and control schools overall, SOFIE club members repeated significantly less often and progressed significantly better than non-club members ($p = 0.05$). As will be indicated later, it does appear that the monitoring of students – and particularly showing care and interest in the well-being of SOFIE club members – had a significant impact on their progression.

When asked about what made the difference in the progression rates since the intervention, members explained that attention being paid to the well-being of orphans and vulnerable children had resulted in students feeling more cared for in the intervention schools. According to one principal, 'the teachers who were trained in psychosocial support have really become very good at talking to these teenagers' (MNS). This was confirmed by a story told by another community member who described how a teacher enquired about one double-orphan who was not attending school and then the teacher found out that he was living with a grandmother who was unable to monitor the child's attendance closely enough. Community members then assisted the grandmother and the school in following up on the child's attendance, and her attendance improved. The community member explains further:

> [ext] Most of the children here live with grandparents who do not have capacity to support the children. So, the link between the schools and homes was not easy (before) because teachers are so busy (MNS). [ends]

Just as with the increased awareness among teachers and the attitude that it is their business to follow up on children's well-being, greater coherence was achieved in this community in the monitoring of children at risk of dropping out of school. Accordingly, another community member described this coherence as follows:

> [ext] The community around this school has benefitted from SOFIE in that they also have become aware of the situation of their children and there is now a better spirit of collaboration and monitoring of children's behaviour (FHS). [ends]

Although statistically significant, the success was not however yet universal. For example, the researcher learned of a single orphan whose mother had left for South Africa to look for work; the orphan disappeared from the care of her aunt and dropped out of school completely. However, both parents and community members reported increased awareness and interest regarding the well-being of children as a result of the intervention. One teacher reported how she had noted improved awareness of social issues amongst her students, a change she attributed to the readers who 'gave children exposure to a lot of important social issues around HIV, pregnancy and drugs', thus raising their resilience levels (FHS). One community member contended that the approach of SOFIE was relevant to initiatives her community had started in order to follow up on orphans and vulnerable children (MNS).

Student Achievements

Student achievements in English were measured both pre-intervention and post-intervention. The results of these are summarized in Table 4.

Table 4: Impact on Student Achievements

ID:/School status		**SCR:/ English score**	**SCR:/ Maths score**	**PostEng**	**PostMath**
Intervention	Mean	50.8641	50.9363	50.3757	53.2208
	N	1052	1051	905	908
	Std. Deviation	13.54028	19.15357	18.85115	20.63540
Control	Mean	49.1235	49.4849	49.4881	46.7142
	N	891	892	628	628
	Std. Deviation	11.78470	18.01093	15.26970	17.71181
Total	Mean	50.0659	50.2699	50.0121	50.5605
	N	1943	1943	1533	1536
	Std. Deviation	12.79147	18.64699	17.47315	19.74809

No significant difference could be found in the performance of the students during post-intervention in both English and Mathematics. Nevertheless, there was a significant difference in the performance between the intervention group and the control group in the post-intervention mathematics scores ($p = 0.05$). During the post-intervention meeting, teachers in intervention schools across all regions reported that the mathematics study guides, which provided alternative ways of conceptualizing mathematics concepts, assisted them as well as their students. One mathematics teacher interviewed on the impact of the project singled out the usefulness of the mathematics study:

> [ext]The study guides were able to mitigate the extremely negative attitudes that persist towards mathematics amongst the students and became additional reference materials for the teachers in the mathematics teacher's school (FHS). [ends]

One student traced the usefulness of the mathematics study guides back to the wrap-around elements which provided students with a more guided approach to tackling the exercises in the prescribed textbooks, giving students a more flexible opportunity to work even in the absence of proper teacher guidance (MNS). Implemented with the assistance of the Lesotho Science and Mathematics Teachers Association (LSMTA), buy-in was more evident in the case of Mathematics than English, and qualitative feedback from SOFIE teachers confirmed the value teachers attached to these materials. While it was not in the design of the project to implement the intervention through the teacher association as closely as happened in the case of mathematics, it was an important finding to learn just how critical such structures can be in enhancing buy-in. On the other hand, SOFIE teachers reported rather poor collaboration from their English teacher colleagues, which resulted in lack of support for SOFIE club members in the English learning aspect of the intervention.

Challenges

There were challenges that emerged during the implementation of what was a well-intended intervention, often revealing the socio-economic contexts affecting educational initiatives in Lesotho. Data collected through informants, including teachers and community leaders, highlighted the uneven terrain in developing countries and the scale of implementation intricacies. This shows that context cannot be regarded as a mere 'inert backdrop' but must be seen as playing 'an active role in shaping the outcomes of the intervention' (John and Rule 2004: 174).

The first major challenge involved the selection of learners who would participate in the SOFIE club which was allocating a very modest school-in-a-bag intervention package. The criteria for this selection were firstly that the child should be a double-orphan and secondly that such child should be extremely poor, based on information supplied by teachers and verified by community leaders. Funding only allowed for a maximum of twenty participants per school, and this appeared to be a reasonable number to manage in a club. In some schools, the scale of poverty and HIV/AIDS was so massive that the number of eligible learners was more than double than what could be afforded. In the words of a teacher from a large school in a low-altitude semi-urban area, FPE has increased enrolments among orphaned and vulnerable children (OVCs) in particular. The teacher said:

> [ext] There are just so many OVCs in Form B these days, especially after the introduction of FPE, that it is very difficult to decide who not to recommend for the club (FHS). [ends]

Therefore, whilst the logic of selecting *in* double-orphans who were significantly vulnerable appeared to make sense methodologically, the first major challenge the team experienced was how to select *out* other OVC learners who were extremely needy of such an intervention because of the impact of poverty and HIV/AIDS. This situation presented challenges not just at a methodological level but also a serious ethical dilemma of designing an intervention that seeks to overcome inequality and yet practically excludes needy learners.

The challenges increased with implementation, first with teachers struggling to find a means of making time to give attention to the clubs. A few teachers appreciated the concept of providing support to OVCs and gave the clubs their attention, but the clubs were generally run with very little assistance from the teachers because of the curriculum demands of secondary schools on teachers. Moreover, the problem was compounded by the fact that the children themselves, especially the OVCs, struggled to find time to participate meaningfully.

Other more subtle challenges included the issue that many of the orphaned boys were much older than the rest of the learners and were rather embarrassed to be singing and playing games with younger learners:

> [ext] And for the girls, it's very difficult because they often have to rush home to attend to family chores…and avoid walking home late because of high rates of abuses by herdboys (MNS). [ends]

There were also reports of a growing incidence of girls – more so than boys – being called on to look after sick members of families and siblings as they grow older, according to one chief (SRV). Additionally, in poor families, girls were reported by community members to be more likely to accede to early marriage in an attempt to escape the increasing burden of poverty at home.

Discussion and Concluding Remarks

Measuring for the overall impact of the intervention has produced some rather mixed results but notable possibilities. In particular, creating circles of support enabled what emerged as important *ecologies of sustainable support for the retention of learners and particularly their progression in rural areas*. The most positive results were found in the use of mathematics study guides, where an improvement was notable in the intervention schools. Evidently, open and flexible modes of delivery can complement circles of support and thus sustain participation and achievement in notoriously unpopular subjects such as Mathematics. In terms of dropout and progression rates, it was encouraging that more learners in the intervention schools progressed to the next level (Form C or Grade 10) than those in the control schools. In particular, control schools appeared to lose more learners than intervention schools. This indicates that monitoring processes and follow-ups on children were beginning to impact positively on the retention and progression of learners. However, it appears that the effect had not yet become significant and that many constraints were still frustrating the implementation during the final evaluation stage. Most notable were the poor levels of cooperation between teachers and that the context of secondary schools makes it very difficult to implement strategies for the reduction of dropout rates and the improvement of performance.

Finally, it has become evident that in the current socio-economic context, more needs to be done to ensure that gains made towards the Millennium Development Goals (MDGs) are not set back in many developing countries as a result of the impact of HIV/AIDS (Kadzamira et al. 2001). There is therefore a clear call for development partners not to hold back on aid to developing countries and for developing countries not to sacrifice spending on education even when resources diminish. The imperative for Lesotho to develop a policy framework for the inclusion of marginalized children, particularly at secondary school, needs to be urgently addressed. Commendable initiatives from the Government of Lesotho and local role players in schools and communities need to be harmonized by policy.

This study has highlighted a number of inequalities and disadvantages that frustrate progress towards the MDGs. Some of these can be addressed at a macro-level, but education can no longer be business as usual; that being the

case, there is a great deal that clearly needs to change at school-level. Schools need to become more aware of some of the explicit and subtle exclusionary practices. Removal of fees is not yet a viable option for many schools, although more regulation could assist in reducing the extent of exclusion as a result of very high fees in some cases (Lerotholi 2001). Nonetheless, it is clear that practices within schools could play a more significant role. Awareness about the situation of orphaned and vulnerable children and how to monitor and support their progress was one of the initiatives of the SOFIE project.

The challenges at secondary level regarding the monitoring and support of children are massive because unlike at primary level, some secondary school teachers are involved, and collaboration is required. It requires a different mindset from the traditional role played by class teachers. The traditional practice of class teachers needs to evolve into a more professional and caring support practice. A framework where class teachers are as critical to the system as heads of departments needs to be set up; an allowance for the exercise is not an excessive requirement in order for them to take it more seriously. This study has indicated that the current format of class teachers is not effective in supporting or monitoring attendance and performance. A change in mindset among teachers is also needed. Schools need to consider more affordable interventions that are grounded in current philosophies of teaching and learning. ODFL approaches are not just complementary to conventional teaching but are also very much part of the current thinking in meaningful teaching and learning. ODFL can be used to enhance teaching approaches by increasing learner participation and meaningful learning.

The interventions in schools were challenged by logistical constraints such as the late arrival of materials. But they demonstrated the potential to improve learning even in the most notorious subject such as Mathematics. The demonstrated potential to improve mathematics depended more on learners supporting one another than on the effort of teachers. A key issue emerging is the importance of creating ecologies of support for supporting participation and improving achievement through circles of support, especially within the much-disrupted rural contexts. With minimal supervision, it can be concluded that even the English skills of learners would benefit from such clubs. The clubs further provide an opportunity for these children to engage in other activities that are relevant to the developmental stage. Teenagers are at a stage of discovery and social exploration, and in some of the clubs, they were able to engage in activities such as drama and debates. This affordable form of intervention that draws mostly on learner-to-learner interaction and teacher supervision – a cycle of support – clearly has huge potential for rural education in Lesotho and other countries experiencing similar disruptions to learning. Part of the

'big push' towards the MDGs will require that stakeholders in the field, such as teachers and health workers, receive support towards introducing and sustaining low-cost initiatives to address social inequalities and marginalization. Therefore, even with issues of uneven buy-in and the major socio-economic challenges affecting participation rates across the country, open and flexible approaches – implemented with a circle of support – have the potential to improve retention and progression in the rural areas, even positively affecting performance in notoriously difficult areas of study such as mathematics.

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Note

1. Thakaneng is a Sesotho practice whereby boys and girls are accommodated separately overnight in order to be socialized around cultural norms, presided over by an elder.

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Transformative Autonomy: Mixed Notes from Teachers to Higher Education

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Abstract

Transformative autonomy is 'the form of autonomy in which school role players, such as teachers, have the urge to be involved with fellow role players in education development initiatives towards social transformation which contributes to democracy' (Nel 2014: 790). This theoretical construct was formulated to narrow the gap between teaching practice and societal concerns since it recognizes that teachers do have a certain degree of autonomy over their professional practice but also a responsibility towards the evolving South African democracy. In an effort to test the veracity of transformative autonomy as a theoretical construct data was gathered from three sets of participants: twenty-six postgraduate students, thirteen rural primary school teachers and thirty-one conference delegates. Some key findings are that participants generally acknowledged their control over curriculum aspects and some degree of control over matters of discipline. A curious finding is the appearance of discipline as an aspect over which some participants felt they have control and other participants felt they had no control. These findings, and others, are discussed in the context of transformative autonomy. One of the main conclusions is that these participants display an intuitive understanding of their autonomy as teachers but that they still do not have a clear idea of how to link their expertise to societal transformation. It is lastly concluded that the issue of autonomy has epistemological implications insofar as the condition of knowledge production, reproduction and dissemination is concerned, all of which impact on teachers' intellectual integrity. Higher education, therefore, is alerted to its responsibility in teacher training.

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Résumé

L'autonomie transformatrice est « la forme d'autonomie dans laquelle les acteurs de l'école, tels que les enseignants, éprouvent l'envie de s'impliquer avec d'autres acteurs dans les initiatives de développement de l'éducation en vue de réaliser la transformation sociale qui contribue à la démocratie » (Nel 2014: 790). Ce construit théorique a été formulé pour réduire l'écart entre la pratique de l'enseignement et les préoccupations sociétales, car il reconnaît que les enseignants disposent d'un certain degré d'autonomie sur leur pratique professionnelle, mais aussi une responsabilité vis-à-vis de la démocratie sud-africaine en pleine évolution. En vue de vérifier la véracité de l'autonomie transformatrice en tant que construit théorique, des données ont été recueillies auprès de trois groupes de participants: vingt-six étudiants de troisième cycle, treize enseignants du primaire en milieu rural et trente-et-un délégués de conférence Quelques résultats clés indiquent que les participants ont généralement reconnu avoir la maîtrise des aspects du programme d'enseignement et un certain niveau de maitrise des questions de discipline. Une observation curieuse est le fait que la discipline soit apparue comme un aspect jugé maitrisé par certains participants et non maitrisé par d'autres. Ces résultats, ainsi que d'autres, sont examinés dans le contexte de l'autonomie transformatrice. L'une des principales conclusions est que ces participants affichent une compréhension intuitive de leur autonomie en tant qu'enseignants, mais qu'ils n'ont pas encore une idée claire de la façon de lier leur expertise à la transformation sociétale. Enfin il conclut que la question de l'autonomie a des implications épistémologiques en ce qui concerne l'état de production, de reproduction et de diffusion des connaissances, qui ont toutes des effets sur l'intégrité intellectuelle des enseignants. Par conséquent, l'enseignement supérieur est alerté sur sa responsabilité dans la formation des enseignants.

Introduction

Following the well-publicized academic conflict experienced by the respected scholar, Professor Mahmood Mamdani, at the University of Cape Town in the late 1990s, Kamola (2011: 162) concludes that 'Mamdani's political engagement at UCT speaks to a continued faith that the post-apartheid university can continue to serve as a site of social and political revival, resistance and redistribution'. If education faculties of post-apartheid South African universities take heed of this conclusion, then their programmes should do more than just equip student teachers with the technical skills of their chosen school subjects. In South Africa education reforms have become commonplace (Republic of South Africa 2011: i) as reform and review efforts in 1997, 2000, 2002, 2009 and 2011 attest. A danger always lurks in such reform efforts as policy draft-

ers and implementers might be tempted by 'technical rationality' (Tabulawa 2013: 156) that emphasizes teachers' mastery of the techniques and contents of teaching to the detriment of the social purpose of education. In this context I advocate that the training of teachers by universities should inculcate transformative autonomy as one of the values that graduates should leave the university with. In that way the university in South Africa can still play the role that the Mamdani affair highlighted, as argued by Kamola (2011: 162).

In pursuance of the argument for transformative autonomy by teachers I pose the broad theoretical idea of critical community psychology in education as the overarching framework through which my interest in education is studied. The concept of transformative autonomy is then unpacked. An empirical backdrop is offered against which I tested the existence of transformative autonomy in teachers' professional practice. Analyses and discussion are offered on some aspects of the empirical work. I conclude with the implications that the inculcation of transformative autonomy has for higher education, teacher education in particular.

Theoretical Orientation

In recognizing the general critique against orthodox psychology of neglecting the role of context in its understanding of psychological problems (Nelson and Evans 2014: 159; Rappaport 2000: 107), as an academic psychologist in education I choose to align myself with the ideals of critical community psychology. With the overt theoretical positioning of community psychology since its formation as an avenue for the seeking of social justice (Rappaport 2000: 107), this choice was easy because education in South Africa is committed in legislation to the eradication of the inequalities of the apartheid past, i.e. striving towards a more socially just dispensation through education (Republic of South Africa 1996a: 4; Republic of South Africa 1996b: 3). The tested ideals and values of critical community psychology include: care and compassion (Ferreira, Ebersöhn and Odendaal 2010: S108); appreciation for socio-political understandings of mental health (Thompson 2007: 75); working in a psycho-politically valid manner in research and action towards change (Morsillo and Prilleltensky 2007: 726, 738). In all of these ideals and values it is clear that critical community psychology always keeps a focus on societal improvement which counters practices that can be regarded as racist, xenophobic, sexist, culturally bigoted or classist.

Accepting that education is about much more than the simple transfer of skills for the advancement of economic opportunities for the holder of such skills (Vally and Motala 2014: 43–44), logic then dictates that several societal pressures add to the psychology that can develop in the educational enterprise. These pressures include politics, economics, demographics and

culture, systemic and institutional arrangements (Angelique and Kyle 2002: 36; Motala and Vally 2014: 16; Seedat and Lazarus 2014: 275). The *Monterey Declaration of Critical Community Psychology* therefore rightfully urges community psychologists to, amongst other principles, commit 'to work actively to transform social, cultural and institutional arrangements that foster social injustice' (Angelique and Kyle 2002: 36). A critical community psychology in education recognizes these societal pressures and works towards a deep understanding and transformation for the greater good (Kagan et al. 2011: 64–66).

Basic education in South Africa mostly happens in public schools, with a minority of learners in private education and home schooling. I focus on public education and the community psychology at play in such settings, as I regard the public school as a community. The concept of community refers to the grouping of people for different reasons such as the need to study them as a unit or for the purposes of policy formulation but in psychological terms it denotes the human space within which identities are negotiated, conferred or developed (Kagan et al. 2011: 71). The public school community is a complex space beset by many challenges of a social nature.

Some, if not most, of these challenges find teachers ill-equipped to deal with them. In South Africa many studies attest to this mismatch of teachers' skills to the challenges. One of the challenges for which formal training does not equip teachers is the need to promote relational well-being in school communities (Wagner 2014: 119). Another challenge is in the area of sexuality education where it was found that mothers for instance need guidance and support on how to broach the subject of sexuality with their adolescent daughters (Twaibane 2011: 75). With regards to the competencies needed to adapt to curriculum changes and subject teaching, it is instructive to note that teachers do acknowledge inadequacies in their pre- and in-service training leading to uncertainty, e.g. in Natural Science (Maema 2011: 92). In order to remove parents' perception that the school is 'the main barrier to their involvement' (Mashau 2011: 181) teachers need to do more to bridge that perceived gap. With child-headed households a reality in many school communities, teachers, again, face a challenge of how to support such learners meaningfully (Nhlapo 2014: 76). By no means do these challenges constitute a finite list but they serve to illustrate the different areas in which the teacher is expected to function beyond the technical tasks of teaching.

Given the apartheid past and the training that some teachers received during that era, it stands to reason that even at the epistemic level, South African teachers face another challenge. This challenge is the imprisonment of thought by the racial pattern of resource distribution, including knowledge production, which entrenched white supremacy as the hegemon (Ouédraogo and Bouda

2011: 19). Ndlovu-Gatsheni (2013: 264) laments the blockage this state of affairs created regarding the creativity in knowledge production and dissemination. In order to overcome this and the other kinds of challenges, the South African teacher needs a wider array of skill and demeanour.

Under the apartheid system, as in other forms of coloniality, the notion of teacher power was dreaded as it was viewed as 'the undesirable beginning of some dangerous subversion' (Ouédraogo and Bouda 2011: 20). Close government control over teachers' activities was the order of the day, leading to a corps of teachers to whom the exercise of autonomy was an alien concept; a situation experienced as similar even in current day South African education as the Department of Basic Education retains its power by dictating the outcomes to be reached explicitly (Palmer and De Klerk 2012: 74).

For a critical community psychology to develop in South African public schools, all these challenges faced by South African teachers need to be considered. I suggest that an alternative conceptualization of teacher autonomy is one area in which research can be done to determine kernels of solutions.

Transformative Autonomy

This article builds on my published work (Nel 2014) in which I introduce the concept 'transformative autonomy'. In short, transformative autonomy is exercised when teachers and other school role players fulfil their professional duties not just in technical compliance with policy but as a contribution to positive social transformation (Nel 2014: 790). This social transformation is the same kind that is advocated by critical community psychology, namely towards a society less burdened by unequal systemic arrangements that advantages some at the same time as disadvantaging others. Transformative autonomy, then, has an overt liberatory political focus.

This form of autonomy I pose as an alternative to the notion of teacher autonomy in which teachers disallow external influence and scrutiny, with a resultant danger of stagnation in professional development (Jansen 2004: 64). With reference to education reform efforts in Botswana, but which, I argue, could also apply to South Africa, Tabulawa (2013: 154) concludes that too strong a focus on compliance with skills-building and assessment in education results in weakened teacher autonomy. The difference between the transformative autonomy that I advocate and the weakened forms described by Jansen (2004: 64) and Tabulawa (2013: 154) is that transformative autonomy explicitly links education to societal transformation, i.e. it is a political project of critical cultural consciousness through which a 'critical professional community' (Bristol 2010: 180) plays its part in the improvement of the society for whom it educates.

As is apparent in these descriptions above it can also be suggested that autonomy consists of a continuum. I am fully aware of the critique against classifying and essentializing complex matters into a simple linear form such as a continuum, as is illustrated by Fox and Sandler (2003: 469) with reference to concepts in Political Science or by Pedwell (2007: 45, 48) in Gender Studies. Still, due to the relative novelty of the concept of transformative autonomy I risk suggesting a continuum of autonomy in the knowledge that further development of the concept will lead to more complex depictions. On the conservative end I would place the weaker forms of autonomy. Those forms of autonomy, it can be argued, are strongly influenced by governmentality, i.e. where government has a strong influence, covert and overt, on how people argue for and justify certain choices or where government supplies solutions to problems (Lemke 2007: 44). A different form of weak autonomy is where the rejection of external scrutiny to the detriment of professional growth is postured as radical. Following the logic in the preceding paragraphs transformative autonomy would count among the stronger forms of autonomy at the progressive end of the continuum.

Precarious as this suggestion of a continuum might be, it offers me an analytical tool to investigate what autonomy looks like empirically in education.

Empirical Backdrop

As part of my continued exploration of critical community psychology in education I ventured into the second foray of my work on transformative autonomy after posing the concept first (Nel 2014). The *aim* of the current work then was to explore the extent to which teachers' own expressions about autonomy match the ideal of transformative autonomy as posed earlier in the theoretical orientation. This work is necessarily qualitative in nature because the participants' written expressions are employed as data (Denzin and Lincoln 2005: 25) to understand their social world and I am the instrument of data gathering as well as interpretation (Terre Blanche, Kelly and Durrheim 2012: 274, 276).

Participants

In the data gathering exercises taking place on separate dates throughout 2014, I offered three separate, unrelated sets of participants the opportunity to write their thoughts about autonomy. In the case of the first two groups the concept of autonomy was equated with a broad notion of control regarding aspects related to the tasks of a teacher. This choice was made so as not to unnecessarily complicate matters for the participants. The third group of participants had to respond to the term 'transformative autonomy' directly since they benefitted from a conference presentation in which I used the term.

The first group of participants consisted of twenty-six postgraduate students; twenty-five female and one male, all of whom were in-service teachers; hereafter called 'the students'. The students were asked to write down the aspects they think they have control over in their position as teachers. This data was gathered in English from ten older African black students, and in Afrikaans from sixteen young white students, as the class consisted of students studying in either one of the two languages in accordance with their university language policy. For clarity it should be noted here that the apartheid system classified black people (those who did not overtly benefit from the racially segregated system) into African, mixed-race and Indian. These terms will be used not as an endorsement of the racist notion of difference but for the sake of context description.

A second group of participants was made up of thirteen, mostly older, mixed-race, Afrikaans-speaking teachers; nine female and four male, from one rural, primary township school hosting children from a mixed-race, poor community; this group will henceforth be named 'the rural teachers'. The rural teachers were also asked to write down the aspects they thought they had control over as teachers and, additionally, those aspects they reckoned they had no control over. This data was gathered in Afrikaans, the participants' home language.

The third group of participants comprised of thirty-one, mostly older, mixed-race, Afrikaans-speaking primary school teachers; sixteen female and fifteen male, who were delegates at a teachers' conference where I presented a paper on transformative autonomy; this group will be referred to as 'the conference delegates'. The conference delegates were asked to write down their opinions about the concept of transformative autonomy as presented. This set of data was also gathered in Afrikaans, the participants' home language.

All three groups of participants agreed to the ethical principle of voluntary participation in an anonymous fashion. Therefore the data was gathered in a trusted relationship of honest, voluntarily responses tendered to me in my different power roles as lecturer, researcher and conference presenter (Mertens 2014: 521). The thematic analysis as strategy to condense and categorize data (Maxwell and Chmiel 2014: 26) then also rests on the assumption that participants produced trustworthy data.

Main Findings Thematically Represented

The following themes arose from the different data sets. The twenty-six students indicated the following areas over which they think they have control in their tasks as teachers, in descending order of number of responses per theme: 1. curriculum aspects related to the task of teaching and learning; 2. learners'

discipline; 3. students' own attitudes towards teaching and learning; 4. learners' attitudes towards teaching and learning; 5. students' own professional conduct; and, to a lesser extent, community-related aspects such as parental involvement and home circumstances. A breakdown of the students' responses revealed a strong spread of responses regarding the first three themes, curriculum, learner discipline and own attitude, amongst the sixteen white, Afrikaans-using students. The ten African black English-using students' responses were mainly found in the first theme, curriculum.

The thirteen mixed-race, Afrikaans-speaking rural teachers' responses about aspects over which they thought they have control coalesced around the following main themes in descending order of number of responses per theme: 1. curriculum matters; 2. learner discipline; 3. sports coaching; 4. cooperation with colleagues. The first theme regarding curriculum matters was found in an overwhelming majority of responses. Other themes that also came up but with very few response numbers include: professionalism, relationships with learners, networking with role players outside of education, parental engagement.

The thirteen rural teachers furthermore provided responses regarding aspects over which they thought they have no control under the following themes in descending order of number of responses per theme: 1. parental involvement; 2. home and socio-economic conditions; 3. learner discipline and absenteeism. The following themes surfaced but with very low numbers of responses: district office of education, inclusive education implementation, resources for practical subjects, time lost to sport, school readiness, curriculum formulation.

The thirty-one mixed-race, Afrikaans-speaking conference delegates grappled with the concept of transformative autonomy and overwhelmingly displayed an understanding of the concept's main tenets of societal responsibility and control over professional conduct.

In the next subsection I discuss the implications of some of these findings.

Discussion

It can safely be speculated, in summary, that the three sets of participants have an intuitive understanding of autonomy. The students and the rural teachers' concept of autonomy cannot yet be termed transformative autonomy because they gave an over-concentration of responses concerning the professional duties of being a teacher and too few intuitive indicators of their awareness of societal transformation inherent in transformative autonomy. Again, it can safely be speculated that conference delegates were able to display the link between education and its role in societal transformation because they received a full conference presentation which unpacked transformative autonomy.

Looking at the racial patterns that were evident in the themes, namely that white participants had a more extensive range of themes in their responses than mixed-race and African participants, my speculation leads me to different contexts of teaching. I therefore suggest that the context of under-resourced schools and adequately resourced schools may have played a role in the immediate concerns that were uppermost in participants' thoughts. The black participants (African and mixed-race) are all teaching in under-resourced schools and the white participants teach in adequately resourced schools. Apart from the context of teaching it might just be possible that the different basic training regimes for the teachers may have differed in quality given the general age differential between black and white participants. As was the case under the racially segregated system of apartheid the most resources were allocated to whites and, in staggered measure, there were fewer resources for mixed-race people and even less for African blacks. This state of affairs had an impact on the quality of education provision for the different racial groups with whites receiving the best education and training, and blacks the least so. It then stands to reason that the basic training of teachers had an impact on the kind of education teachers are capable of delivering.

The argument, based on the empirical evidence of differences in distribution of responses by white and black participants, is then ventured that a combination of differences in basic training and current resourcing accounts for white participants' varied responses and black participants' singular response. Deepening the argument, I also suggest that the more difficult teaching conditions for black participants lead them to preserve their power position in favour of a teacher-focused notion of pedagogy which probably makes it easier for them to function professionally, and perhaps, culturally. The spectre of Fundamental Pedagogics is raised by this argument.

This form of pedagogy, which was taught as a philosophy of education at all colleges of education during apartheid (Robinson, Vergnani and Sayed 2002: 5), is criticized for then being responsible for confirming the prevailing racial-political order in South Africa (Higgs 1999: 122) and for creating a corps of docile teachers who did not learn to question authority (Kumar 2010: 8). The majority of black teachers in my study are of an age which makes them eligible for having studied Fundamental Pedagogics. Their strict focus on curriculum matters to the neglect of societal factors can possibly be ascribed to the kind of pedagogy which emphasizes teacher-controlled curriculum delivery.

Closer inspection of the curious finding from the rural teachers concerning learner discipline, described by them as both under control and not under control, can lead to an interpretation that the epistemological condition needs interrogation. Millei (2005: 129) argues that a discourse of control is at play

when conservative teachers speak about discipline. I connect this logic to my finding in the following manner. Where teachers regard knowledge as evolving and hardly fixed in content, the matter of discipline and control is not uppermost in their mind. However, where knowledge is regarded as received and fixed, the need for discipline and control grows. The finding of the rural teachers' and the black students' overly strong focus on curriculum as an area of control gives rise to my interpretation that guarded control over knowledge provides such teachers/guardians with a strong sense of professional control. Such an underdeveloped sense of the power-knowledge nexus leads me then to suggest that compliance-driven knowledge production and reproduction (as expected by policy) are weakening autonomy because such autonomy is too steeped in governmentality with the concomitant effect of easy frustration with discipline problems.

Conclusion

In conclusion I suggest that transformative autonomy should be about more than a posture of being in professional control. Transformative autonomy also has the condition of knowledge production, reproduction and dissemination in mind. If the knowledge work of teachers is done in the service of societal improvement, i.e. as a political project, it strengthens autonomy because of the explicit transformative aims. Under such an understanding of knowledge discipline, problems are regarded as a disruption of discursive arrangements that are in tension with the transformative aims of the epistemological labour. Weak forms of autonomy therefore aim to restore order according to rules.

These rules are not interrogated as expressions of discourses; therefore hegemonic discourses of control are not challenged (Millei 2005: 138). Weak autonomy, therefore, does not advance societal development.

With transformative autonomy the teacher can maintain an 'intellectual integrity' (Holligan 1999: 148) under which new forms of discursive arrangements become possible; power relations are troubled, positively so, and anti-governmentality challenges are brought to lazy compliance, complacency and destructive posturing. The task for South African higher education in the preparation of teachers is to inculcate this stronger form of autonomy: transformative autonomy.

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School–University Partnerships for Professional Development of Teachers: A Case of Lesson Study Intervention in Mathematics

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Abstract

School–university partnerships for the professional development of teachers continue to be used extensively in South Africa to enhance the quality of teaching and learning, especially in mathematics. The success of such partnerships in changing teachers' classroom practices, however, remains in doubt, in part because very few studies present empirical evidence of the changes. This paper assesses the impact of one such partnership, which resulted in perceived changes in teachers' instructional practices and curriculum decisions after the intervention. Using retrospective pre-testing design, the study established that there were significant differences between teachers' pre- and post-test scores, which suggests that teachers changed their instructional practices and curriculum decisions after the intervention. The findings provide some empirical evidence that partnerships of this nature, between schools and universities, may prove valuable in attempts to improve the teaching of school mathematics, especially in the South African context.

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Résumé

Les partenariats écoles-universités pour le développement professionnel des enseignants continuent d'être largement utilisés en Afrique du Sud pour améliorer la qualité de l'enseignement et de l'apprentissage, particulièrement en mathématiques. Cependant, la capacité de ces partenariats à changer les pratiques pédagogiques des enseignants est incertaine, en partie parce que très peu d'études présentent des données empiriques sur les changements. Cet article évalue l'impact d'un tel partenariat, qui a entraîné des changements patents dans les pratiques pédagogiques des enseignants et les décisions concernant les programmes scolaires après l'intervention. En utilisant un modèle de pré-test rétrospectif, l'étude a établi qu'il y avait des différences significatives entre les scores des enseignants enregistrés lors du pré- test et du post-test, ce qui suggère que les enseignants ont changé leurs pratiques pédagogiques et leurs décisions relatives aux programmes après l'intervention. Les résultats fournissent des preuves empiriques montrant que de tels partenariats entre les écoles et les universités peuvent se révéler précieuses pour l'amélioration de l'enseignement des mathématiques à l'école, en particulier dans le contexte sud-africain.

Introduction

Since the Jomtien conference on Education for All in 1990 called for an increase in partnerships in education, various kinds of partnerships have proliferated. These partnerships include school–university partnerships (Bartholomew and Sandholtz 2009), university–university partnerships (Samoff and Carrol 2004) and school–university–donor agency partnerships (Bukari and Jita 2009). The present study involved a school–university partnership, which was designed to improve the teaching and learning of mathematics in the Free State province of South Africa.

Researchers have, for some time, been calling on universities and schools to collaborate systematically to achieve school reform and teacher development (Allen, Howells and Radford 2013; Walkington 2007). Partnerships in education provide a way of achieving more with less, in that they enable maximum utilization of available resources to achieve educational goals and to foster innovation (Walkington 2007). Universities and schools have a symbiotic relationship – both organisations produce and implement knowledge for reform and research purposes. It is no surprise that researchers such as Borthwick et al. (2003: 356) boldly state that 'school and university partnerships are here to stay'.

Schools and universities often work together in initial teacher preparation, when universities place their pre-service teachers in schools for work-integrated learning (Zimpher and Howey 2005). In some cases, the partnership may be

for research purposes to encourage teachers to conduct research together with university academics (Burton and Greher 2007). There are also reports on the use of partnerships for the preparation and empowerment of school principals (Browne-Ferrigno and Barber 2010). Internationally, there is renewed interest in systemic and effective school–university partnerships to improve the quality of in-service teachers through professional learning (Walkington 2007).

School–university partnerships create opportunities for teachers and university academics to learn by drawing on each organization's knowledge and expertise (Bartholomew and Sandholtz 2009). By virtue of their mandate of training and producing teachers, university academics have the capacity to assist teachers in choosing the appropriate teaching methods and strategies for specific topics (Walsh and Backe 2013). In the same vein, schools assist universities academics to comprehend the realities of the classroom, and therefore, schools provide the necessary information that allows university academics to design professional development interventions that address their needs. A number of researchers (e.g. Darling-Hammond and Richardson 2009; Desimone 2011; Guskey and Yoon 2009) describe ideal conditions for professional learning to occur effectively. The best way to create most of these conditions is through partnerships.

The school–university partnership described in this paper uses Lesson Study, an innovation that is credited with the consistent improvements of Japanese teachers' instructional practices and student achievement in mathematics (Stiegler and Hiebert 1999). Lesson Study is a school-based professional development approach that is completely driven by teachers and where teachers work collaboratively to improve instruction and student learning. The common activities of Lesson Study in which teachers participate involve research and common planning, teaching and peer observation, and post-observation group reflection (Lewis 2009).

Many studies report that teachers' classroom practices improve as a result of professional learning in a partnership (Mogari and Onwu 2004; Saito et al. 2007), but there is very little work to demonstrate sustainability of such improvements beyond the life of the learning interventions. Similarly, South Africa grapples with the reality of identifying interventions that can impact on teachers' practices beyond the usually brief periods of intervention. Given the popularity of Lesson Study as a school-based, self-sustaining professional development approach for mathematics teachers in other parts of the world, little is known about its effectiveness in the South African context (Posthuma 2012). This paper assesses the impact of a school–university partnership by answering the following research questions:

- What are the effects of Lesson Study intervention (i.e. research and common planning, teaching and peer observation and post-observation group reflection) on teachers' curriculum decisions?
- What are the effects of Lesson Study intervention (i.e. research and common planning, teaching and peer observation and post-observation group reflection) on the participating teachers' instructional practices?

Review of the Relevant Literature

School–University Partnerships

As mentioned above, in many countries, partnerships are regarded as valuable structures for facilitating the professional development of teachers. A study conducted in Indonesia, for example, assessed the impact of a school–university partnership on teachers and the university faculty (Saito et al. 2007). The intervention used a derivative of the Lesson Study approach called Piloting Activities to improve teacher attributes. The findings suggest that teachers' ability to deal with 'visible practices' (students' worksheets, students' process skills and lesson planning) improved as a result of participation in the Piloting Activities.

In South Africa, a partnership was established between the University of Venda and the Limpopo Department of Education called UNIVEMALASHI, which sought to assist teachers with the implementation of educational reforms (Mogari and Onwu 2004). Here too, the authors reported success regarding the ability of the approach to assist teachers to alter their classroom behaviour. The teachers reportedly worked more closely with their learners and improved their questioning skills, which led to increased curiosity and autonomy on the part of the learners.

There are a number of similar studies that report on the positive impact of school–university partnerships on teachers' classroom practices that have prompted the present investigation into the impact of Lesson Study within partnership in the Free State province.

Lesson Study

Lesson Study is a reflective teaching approach, where teachers work collaboratively to examine teaching and learning in the classroom. Although Lesson Study has been employed by Japanese schools for over four decades, it was only brought to the attention of the international education community in the 1990s by the Third International Math and Science Study (Stiegler and Hiebert 1999). Lesson Study has since spread and is practised in many countries, including the Unites States of America, Australia, Kenya, Malaysia and South Africa.

The aim of the Lesson Study is, fundamentally, to improve instruction by promoting collaboration and sharing of practice. The underlying principles of Lesson Study are that teachers are likely to alter and improve their instructional practices after observing other teachers who are knowledgeable about the subject matter and pedagogy (Perry and Lewis 2009). The Lesson Study group usually comprises four to six members who teach the same subject or grade. The activities of a Lesson Study group are usually referred to as a cycle that begins with research and common planning of a lesson and concludes with further research and (re-)planning or refinement of the lesson.

Research and Common Planning

After the formation of the Lesson Study group, the members choose a research theme (Lewis 2009). The members then identify a unit of study, plan for a series of selected lessons from a unit and one research lesson to be presented by one member of the group.

Teaching and Peer Observation

The research lesson is then presented by one member using the formulated lesson plan, while the other members of the group observe the lesson presentation. The observations focus mainly on the students' learning and their engagement during the lesson (Perry and Lewis 2009).

Post-observation Group Reflection

After the presentation and observation, the group reflects on the lesson and discuss strong and weak points of the lesson (Lewis 2009). If necessary, the group then revises the lesson plan and nominates another member of the group to present the revised lesson to a second group of students, thus completing the cycle.

Lesson Study is not completely new to South Africa. It was used, for example, as an approach to professional development in the Mpumalanga Secondary School Initiative (MSSI) partnership (Jita, Maree and Ndlalane 2008). In their final reflections about the MSSI partnership, Ono and Ferreira (2010) note that the partnership failed to institutionalize Lesson Study as a form of school-based in-service education and training, partly due to implementation difficulties. While the Lesson Study approach struggled to take root in the province of Mpumalanga, Ono and Ferreira (2010) note that the partnership in general had a positive impact on teacher practices, although the impact varied from teacher to teacher. Jita, Maree and Ndlalane (2008) believe that the MSSI partnership contributed to reducing the gap between professional development interventions and teachers' classroom practices.

In yet another study, also in South Africa, five teachers were introduced to a derivative of Lesson Study in the Free State province (Posthuma 2012). Posthuma (2012) reports that the participating teachers were able to reshape their behaviour and to critically reflect on avenues for improving their instructional practices in order to enhance student achievement.

The studies provide tentative evidence of the effects of Lesson Study on South African teachers. The present study therefore continues this strand of research by presenting quantitative data on a South African case of a Lesson Study intervention for mathematics classroom improvement using a relatively large sample of primary- and secondary-school teachers from the Free State province.

Conceptual Framework

Teacher Learning

Teachers are likely to consider altering or improving their practices in a classroom if they acquire new perspectives on their current practices. The acquisition of these new perspectives constitutes what we call teacher learning. Teachers require quality and sustained learning opportunities to change their 'traditional' practices (Hubbard, Mehan and Stein 2006). Furthermore, as Putnam and Borko (2000) argue, learning and cognition are entrenched in social and physical contexts, thus making learning a social process. For this reason, many scholars believe that teacher learning will be more effective when undertaken collegially (Borko 2004; Darling-Hammond and Richardson 2009; Desimone 2011). That is, teachers are likely to learn more within communities of practice (CoP).

Communities of Practice

Communities of practice, as described by Wenger, McDermott and Snyder (2002), have been used in numerous contexts. Wenger, McDermott and Snyder (2002) define CoP as a group of people who share a problem, concern or enthusiasm about a certain topic, and improve their expertise and knowledge by frequent interaction. While research on CoP is positive about their potential benefits to members, questions have been raised regarding the sustainability of CoP. Supovitz (2002) notes that CoP are successful initially, but tend to disintegrate over time. Buysse, Sparkman and Wesly (2003) argue that CoP flourish when they endure over time and offer sufficient learning opportunities for teachers. This study originated from the premise that Lesson Study groups constitute a form of CoP, where teachers examine their own classroom practices with the goal of improving it. The partnership between the schools

and university in this study also represents CoP, where the teachers are supported to enhance their skills through collaborative professional learning in the Lesson Study groups. The situated nature of Lesson Study and the fact that the intervention is driven largely by the mathematics teachers themselves may, in this case, address the concern raised by Buysse, Sparkman and Wesly (2003) relating to the longevity of CoP.

While teachers may learn a variety of skills in CoP such as Lesson Study, this article limits itself to the impact of CoP on the teachers' instructional practices and curriculum decisions. Curriculum decisions are central to events in the classroom, and shape the teachers' classroom practices, which, in turn, determine the students' opportunities to learn (Chabongora and Jita 2013).

Curriculum Decisions

As early as 1983, Shavelson (1983) recognized that teachers' decisions, both conscious and unconscious, are an important part of quality teaching and learning. Curriculum decisions refer to what students are taught, as well as planned and unplanned skills, attitudes and information. In his book, Klein (1991) categorizes the decisions that should be considered when dealing with curriculum, *viz.* decisions about (i) content; (ii) purposes, goals and objectives; (iii) materials and resources; (iv) activities and teaching strategies; and (v) evaluation, grouping, time and space. This paper draws on Klein's framework to examine the changes resulting from the Lesson Study intervention.

Instructional Practices

It is widely accepted in the education community that enhanced instructional practice could have a positive impact on student achievement. Windschitl et al. (2012) propose a core set of instructional practices for teachers that we adapted in our context for mathematics teachers. The set includes (i) developing active learners; (ii) orchestrating collaborative discourse; (iii) varying teaching formats; (iv) employing integrated learning; and (v) encouraging critical thinking, and engaging in reflective practice. These practices are similar, in many ways, to those that were proposed authoritatively by the National Council of Teachers of Mathematics (NCTM), for instance (NCTM 2000).

Method

We used a survey to assess the impact of the Lesson Study intervention on the decisions and practices of mathematics teachers who participated in the study (Cresswell 2014). Retrospective pre-testing was the preferred approach for data collection in this study. Howard, Schmek and Bray (1979) describe a discrepancy called 'response shift bias', which confounds most pre- and post-

test self-reports. Response shift bias is a phenomenon that involves participants evaluating themselves from different frames of reference. To overcome this phenomenon, Howard, Schmek and Bray (1979) suggest that the pre-test should be administered around the same time as the post-test. Researchers agree that retrospective pre-testing may be a more effective approach for assessing the impact of interventions using self-reports than the traditional pre- and post-test approaches (Hetcher 2011; Kistler and Brier 2003).

Participants

The sample consisted of primary- and secondary-school teachers of mathematics from the Free State province who participated in the Lesson Study intervention. The participants (n = 110) were nominated by their employers for the intervention. In total, ninety-three questionnaires were completed and returned, with only eighty-five participants (77 per cent of the original sample) answering the questionnaire correctly to enable analysis. The biographical data profile of the participants is presented in Table 1 below:

Table 1: Biographical Information

Variable	Description	Quantity
Gender		
	Male	36.5% (n = 31)
	Female	63.5 % (n = 54)
Age		
	Under 25	2.4% (n = 2)
	26–29	7.1% (n = 6)
	30–39	12. 9% (n = 11)
	40–49	57.6% (n = 49)
	50–59	20.0% (n = 17)
Teaching experience		
	Under 2	3.5% (n = 3)
	2–4	14.1% (n = 12)
	5–9	15.3% (n = 13)
	10–15	14.1% (n = 12)
	16–20	24.7% (n = 21)
	Over 20	28.2% (n = 24)

Qualifications		
	3 year Diploma (Education)	15.3% (n = 13)
	3 year Diploma + ACE	28.2% (n = 24)
	4 year Bachelors (Education)	14.1% (n = 12)
	3 year Bachelors + Teacher certificate	8.2% (n = 7)
	4 year Diploma (Education)	3.5% (n = 3)
	Senior qualification (Hons, MSc, PhD + Teaching certificate)	8.2% (n = 7)
	Senior qualification (Hons, MEd, PhD in Education)	17.6% (n = 15)
	Other	4.7% (n = 4)
Number of interventions (Previous 2 years)		
	None	14.1% (n = 12)
	1	20.0% (n = 17)
	2	24.7% (n = 21)
	3	17.6% (n = 15)
	4	10.6% (n = 9)
	5	12.9% (n = 11)

Programme Description

The Lesson Study intervention was a product of a partnership between the University of the Free State (UFS) and the Free State Department of Education (FSDoE). The partnership sought to develop a sustained, intense and focused professional development intervention to address the challenges encountered by teachers and students in their day-to-day teaching and learning of mathematics in primary and secondary schools. The backdrop of the intervention is the unsatisfactory performance of primary and secondary school mathematics students in South Africa over the past few years (HSRC 2011).

The Japanese Lesson Study approach was used as a vehicle for the intervention. The workshops were presented over a period of six days spread over six months. The two-day, face-to-face sessions every second month were hands-on and teachers participated interactively in researching, planning and delivering exemplary lessons on selected mathematics topics during the workshop. After each workshop, the teachers were expected to implement what they had learned and compile a portfolio of evidence to document their implementa-

tion at school. The implementation began with a request that the teachers set up Lesson Study groups at their schools, where they would practice the ideas learned at the workshops. During the workshops, the teachers engaged in the learning of mathematics through the use of laboratory activities and manipulatives designed to improve the necessary conceptual and process skills that are essential for understanding and presenting content to diverse groups of learners. The intervention was divided into three modules as follows.

Module 1: Lesson Study Approach (Contact Session)

The module introduced teachers to the Japanese version of Lesson Study through both literature and video clips. Furthermore, the module offered the teachers several opportunities to actually engage in the various stages of the Japanese version of a Lesson Study, including doing preparatory research for a lesson topic, planning a lesson, delivering the lesson and collaborative reflection on the lesson.

Module 2: Mathematical Knowledge for Teaching (Contact Session)

In this module, the teachers worked on identifying the key themes of each topic in the mathematics curriculum. Examples were taken from sections of the content that had been identified as the most challenging and problematic for teachers and learners by the FSDoE. The module was designed to improve and develop the teachers' Mathematical Knowledge for Teaching (Ball, Thames and Phelps 2008), which includes deeper conceptual understanding of key mathematical topics and the ability to identify common errors and misconceptions among learners.

Module 3: Teaching and Lesson Study Practicum (School-Based)

This module was designed to provide teachers with the opportunity to create and sustain Lesson Study groups for mathematics in their own schools. The teachers had to take part in at least one Lesson Study cycle at their schools or districts, and had to present at least one collaboratively planned lesson in mathematics to a group of learners. A portfolio of evidence (PoE) also had to be submitted, together with specific endorsements by a school supervisor (such as the principal, deputy and/or head of department).

Data Collection

In the last session of the workshop (six months later), the teachers were requested to complete a questionnaire regarding changes in their instructional practices and curriculum decision-making that resulted from participating in the intervention. One of the researchers personally administered the 45-minute questionnaire to the teachers.

Instrument Design

The instrument was a five-point Likert-scale questionnaire with responses ranging from strongly disagree to strongly agree. The questionnaires contained before- and after-the-intervention parts, in line with retrospective pre-testing protocols.

Using guidance from Klein (1991) on curriculum decisions, and framing on instructional practice components by Windschitl et al. (2012), we developed items and/or modified others from accessible unpublished theses and published research papers (for example, Rock and Wilson 2005; Wright 2009) that measured the impact of Lesson Study on teachers. The items were then grouped into their respective subscales.

Reliability

Cronbach's alphas were calculated to determine the internal consistency of the instrument (McMillan and Schumacher 2010). SPSS was used to calculate the Cronbach's alphas and the results (Table 2) indicate that they were all above 0.7. Reliability coefficients of over 0.7 suggest that the items were reliable (Cohen, Manion and Morrison 2007).

Table 2: Cronbach's Alphas

Construct	Subscale	Cronbach's alpha	Number of items
Teacher practice			
	Research and common planning	0.72	7
	Teaching and peer observation	0.73	5
	Post-observation group reflection	0.70	4
Curriculum decisions			
	Research and common planning	0.87	6
	Teaching and peer observation	0.72	4
	Post-Observation group Rreflection	0.75	3

Data Analysis

Percentages and mean ranks were calculated, using SPSS, to show differences between the pre- and post-test scores. We further calculated means for the subscales to show general trends in the data. For the purposes of this article, the means are used to show differences in pre- and post-test scores together with the mean ranks.

The Wilcoxon signed rank test (see Cohen, Manion and Morrison 2007: 552) was used to establish if there were significant differences between the pre- and post-test scores. The Wilcoxon signed rank test, which is the non-parametric equivalent of a paired sample t-test, assesses this difference by comparing mean ranks, not the means of the pre- and post-tests scores for significance. In essence, a *two-tailed* Wilcoxon signed rank test ($p = 0.01$) was used to test the following null hypotheses:

Curriculum Decision

- There is no difference in teachers' perceived curriculum decision scores before and after the intervention as a result of *research and common planning*.
- There is no difference in teachers' perceived curriculum decision scores before and after the intervention as a result of *teaching and peer observation*.
- There is no difference in teachers' perceived curriculum decision scores before and after the intervention as a result of *post-observation group reflection*.
- *Instructional practices*
- There is no difference in teachers' perceived instructional practices scores before and after the intervention as a result of *research and common planning*.
- There is no difference in teachers' perceived instructional practices scores before and after the intervention as a result of *teaching and peer observation*.
- There is no difference in teachers' perceived instructional practices scores before and after the intervention as a result of *post observation group reflection*.

Ethical Considerations

Permission was obtained from the FSDoE and the required ethical clearance processes of the UFS were followed. Informed consent was also obtained from the participants, who were informed of their right to withdraw from the study at any point, should they wish to do so (McMillan and Schumacher 2010). All the data were secured using encryptions on SPSS.

Findings and Discussions

Research Question No. 1

What are the effects of a Lesson Study intervention on the teachers' perceived curriculum decisions?

Retrospective pre-test scores indicated that there were differences in the teachers' curriculum decisions after the intervention. We illustrate this point by means of one of the items in the research and planning subscale.

After the intervention, there was an increase of forty-two (49.4 per cent) teachers who *strongly agreed* that they were able to choose the appropriate content for their lessons, bringing the total to fifty-nine (69.4 per cent). The data indicates that most teachers changed their choices to *strongly agree* or *agree* after the intervention, with the majority choosing *strongly agree* (see Table 3). This trend could be traced through all the items in the subscales assessing the intervention's impact on teachers' curriculum decisions.

Table 3: Participant Scores in Research and Common Planning Subscale: Curriculum Decisions

	I choose the appropriate content for my lessons				
	Strongly agree	**Agree**	**Not sure**	**Dis-agree**	**Strongly disagree**
Before Lesson Study	20.0% (17)	60.0% (51)	16.5% (14)	3.5% (3)	0% (0)
After Lesson Study	69.4% (59)	30.6% (26)	0% (0)	0% (0)	0% (0)
Change	49.4% (42)	-29.4% (25)	-16.5% (14)	-3.5% (3)	0% (0)

The mean ranks for the subscales provided an overall view of the trends in teachers' scores. The mean ranks and means for the subscales *research and common planning*, *teaching and peer observation* and *post-observation group reflection* before the intervention were 114.08 (2.16), 113.63 (2.19), 111.63 (2.14) and 56.92 (1.47), 57.37 (1.47), 59.37 (1.41) after the intervention respectively (Table 4). The data provided further evidence that most teachers changed their opinions to either *agree* or *strongly agree* after the intervention

Table 4: Mean Ranks and Means
for the Summed Curriculum Decisions Subscales

	Before Lesson Study		*After* Lesson Study	
Subscale	Mean rank	Mean	Mean rank	Mean
Research and common planning	114.08	2.16	56.92	1.47
Teaching and peer observation	113.63	2.19	57.37	1.47
Post-observation group reflection	111.63	2.14	59.37	1.41

Furthermore, the Wilcoxon test statistic revealed that all the hypotheses for the curriculum decisions construct were not supported, as the p-value was below 0.01 in each case. There were significant differences in teachers' curriculum decisions as a result of their participation in research and common planning ($Z = -7.52$; $p < 0.01$), teaching and peer observation ($Z = -7.20$; $p < 0.01$) and post-observation group reflection ($Z = -7.11$; $p < 0.01$). Effect sizes (r) for the subscales revealed that the difference between the pre- and post-test scores was moderately large for all the subscales (Table 5).

Table 5: Wilcoxon Test Statistics and Effect Sizes: Curriculum Decisions

Subscale	**Z**	**p-value**	**r**
Research and common planning	-7.54	0.00	-0.82
Teaching and peer observation	-7.20	0.00	-0.78
Post-observation group reflection	-7.11	0.00	-0.77

The findings suggest that teachers' perceived curriculum decisions improved after their participation in Lesson Study. The mean ranks and means show that teachers were aware of improvements in their curriculum decisions after participating in the intervention. This result is further substantiated by the Wilcoxon test statistic and the p-value, which suggest that these improvements in teachers' curriculum decisions were not due to chance. Lastly, the magnitude of the improvement after the intervention is moderately large, as shown by the effect sizes. The findings support the argument of Darling-Hammond and Richardson (2009) namely, that professional learning interventions tend

to be effective when the focus is on specific curriculum issues in the classroom. Borko (2004) posits that if teachers are to impact student achievement positively, they must have a thorough understanding of concepts, facts and interconnections that are central to the discipline. It could be suggested that in line with findings by Lewis, Perry and Hurd (2009), the teachers' understanding of mathematics content changed significantly after the Lesson Study intervention. Thus, our findings demonstrate that teacher interactions during the research and common planning may have led to improvements in knowledge and/or understanding of important concepts in the mathematics curriculum. By observing other teachers and students in the classroom situation, the teachers' awareness of student thinking during the learning process seems to have improved. Posthuma (2012) argues that teachers derive meanings that inform decisions relating to their actions as a result of group reflection. Reflection is important for teachers, enabling them to assess aspects of their curriculum decision-making; that is, during reflection teachers are able to measure the success of their lessons by evaluating the effectiveness of the decisions taken during the lessons (Lewis 2009).

Research Question No. 2

What are the effects of Lesson Study intervention on teachers' perceived instructional practices?

In a pattern similar to that of the first research question, the data showed significant differences in teachers' pre- and post-test scores after the intervention. An item from the subscale post-observation group reflection is used to demonstrate these differences.

After the intervention, there was an increase of forty-five (53 per cent) teachers who *strongly agreed* that they discuss instruction with their colleagues, bringing the total to fifty-six (65.9 per cent). Once again, a large number of teachers changed their opinions to *agree* and *strongly agree* after the intervention. This trend could be traced through most of the items on perceived instructional practices.

Table 6: Participants' Scores in the Post-observation Group Reflection Subscale: Instructional Practices

	I discuss instruction (teaching) with my colleagues				
	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
Before Lesson Study	12.9% (11)	54.1% (46)	12.9% (11)	17.6% (15)	2.4% (2)
After Lesson Study	65.9% (56)	32.9% (28)	1.2% (1)	0% (0)	0% (0)
Change	53.0% (45)	-21.2% (18)	-11.7% (10)	-17.6% (15)	-2.4% (2)

The mean rank for the subscales *research and common planning, teaching and peer observation* and *post-observation group reflection* before the intervention were 113.86 (2.27), 110.92 (2.04) and 117.02 (2.26) and 57.14 (1.59), 60.08 (1.47), 53.98 (1.40) after the intervention respectively (Table 7). The findings suggest that there were significant changes in teachers' perceived instructional practices as a result of participating in the three activities of Lesson Study.

Table 7: Mean Ranks (and Means) for the Summed Instructional Practices Subscales

	Before Lesson Study		*After* Lesson Study	
Subscale	Mean rank	Mean	Mean rank	Mean
Research and common planning	113.86	2.27	57.14	1.59
Teaching and peer observation	110.92	2.04	60.08	1.47
Post-observation group reflection	117.02	2.26	53.98	1.40

Once more, hypotheses relating to the perceived instructional practices were not supported, as the p-values were below 0.01. There were significant differences in teachers' instructional practices as a result of their participation in research

and common planning ($Z = -7.41$, $p < 0.01$), teaching and peer observation ($Z = -7.05$, $p < 0.01$) and post-observation group reflection ($Z = -7.50$, $p < 0.01$). The effect sizes indicate that the magnitude of the difference between the pre- and post-test scores was large for each of the three subscales (Table 8).

Table 8: Wilcoxon Test Statistics and Effect Sizes: Instructional Practices

Subscale	**Z**	**p-value**	**r**
Research and common planning	-7.41	0.00	-0.80
Teaching and peer observation	-7.05	0.00	-0.76
Post-observation reflection	-7.50	0.00	-0.81

The findings therefore show that the teachers' perceived instructional practices may have improved significantly after their participation in the Lesson Study intervention. These findings are indicative of a shift in teachers' perceived instructional practices as a result of the intervention. The Wilcoxon test statistics illustrate that the improvements in teachers' instructional practices were not due to chance and that the magnitude of the differences in their pre- and post-test scores were, like the finding for the first research question, moderately large. The review of literature carried out by Vescio, Ross and Adams (2008) supports the finding that teachers' practices improve when they focus more on their students. Taylor et al. (2005) report that teachers' interactions during research and common planning results in improved lesson plans, which have a positive effect on student learning. Our findings therefore suggest, in agreement with Lewis, Perry and Hurd (2009), that teachers' conceptions of what constitutes students understanding, and the means to help students learn, may have changed significantly as a result of the Lesson Study intervention. Fernandez (2005) argues that it is imperative to consider student thinking when planning a lesson. The observation of a lesson offered teachers the opportunity to observe students learning without the burden of teaching. As such, teachers were able to jointly plan instructional practices that assist students to learn better. Our results also point to the importance of group reflection for the improvement of instructional practices. Taylor et al. (2005) found that group reflection afforded teachers the opportunity to question assumptions, share information and re-evaluate their practices.

Conclusion and Recommendations

It is evident from the findings that teachers believe that partnership for professional development had a positive impact on their perceived curriculum decisions and instructional practices. The teachers' participation in each of the three major activities of a Lesson Study seems to have contributed significantly to changes in their perceived decision-making and classroom practice. Specifically, teachers reported improvements in their ability to collaborate with other teachers, which helped to improve their knowledge regarding classroom practices and the way students acquire and process knowledge. These results provide evidence that partnerships of this nature could prove valuable in attempts to enhance the standard of mathematics teaching in South Africa and elsewhere. We therefore recommend that teacher learning should, where possible, be orchestrated within the context of partnerships, such as those that involve schools and universities.

Although our results are encouraging, they should be approached with caution. The methodology used to collect data, viz. retrospective pre-testing, has its own inherent weaknesses. For example, participants in the study may feel the need to score the intervention in a way that makes it seem more effective than it actually is. Memory effects also present a challenge, where the assumption is that participants will remember their initial state after a period of time (six months in this case).

Another methodological limitation is the fact that we could not categorically ascertain the external consistency (Confirmatory Factor Analysis, CFA) of the instrument because the number of participants was not sufficient to obtain meaningful results from the analysis. As this methodology uses self-reports, it would be interesting to determine if the perceived changes in teachers' instructional practices and curriculum decisions are visible and enacted in their classrooms. There may also be a need to use more robust methods of determining the impact of partnerships for professional development, not only on teachers but on students as well.

The next phase of our research, which is ongoing, involves a qualitative study of the classroom practices and instructional decision-making by the teachers involved in our study.

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Strategies and Outcomes of Involving University Students in Community Engagement: An Adaptive Leadership Perspective

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Abstract

The purpose of this article is to compare how students and community members learned and applied their knowledge in four small-scale university–community engagement projects during 2013. It draws on the concept of adaptive leadership as an approach and analytical tool in a recently completed community engagement and service learning action research partnership between the University of the Free State (UFS) Qwa Qwa campus and the University of KwaZulu-Natal (UKZN) Pietermaritzburg campus. The project was funded by the National Research Foundation, with additional support from the UKZN Teaching and Learning Fund and UFS Faculty of Education research funds. A total of twelve case studies involved sixty-five students, nine NGOs and four schools. In each case, students worked in teams in response to community requests for assistance. Projects included Saturday curriculum activities for schools, workshops for parents, assisting with film making or archiving, assisting with monitoring and evaluation of rural reading clubs, producing small organic gardens and assisting with a childcare development project. Each case study involved end of project interviews with students and community contacts and some interim observations during the project implementation phase. This article compares four of the case study findings between the two institutions. It outlines how

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the concept of community engagement has evolved and briefly reviews the literature on community engagement, particularly in the South African context. It then introduces the theoretical framework and methodology. The findings suggested that the adaptive leadership approach contributed to stimulating shared ownership of learning.

Résumé

Le but de cet article est de comparer la façon dont les étudiants et les membres de la communauté ont appris et appliqué leurs connaissances dans quatre projets à petite échelle sur l'engagement communautaire des universités en 2013. Il se fonde sur le concept de leadership adaptatif en tant qu'approche et outil d'analyse dans le cadre d'un projet récemment achevé de recherche-action sur l'engagement communautaire et l'apprentissage par le service communautaire, mené dans un partenariat entre le campus Qwa Qwa de l'Université de l'État-Libre (UFS) et le campus Pietermaritzburg de l'Université du Kwa Zulu-Natal (UKZN). Le projet a été financé par la « National Research Foundation » (Fondation nationale de la recherche) avec le soutien de l'« UKZN Teaching and Learning Fund » (Fonds d'éducation et de formation de l'UKZN) et les « UFS Faculty of Education research funds » (fonds de recherche de la Faculté de l'éducation de l'UFS). Au total, douze études de cas ont impliqué soixante-cinq étudiants, neuf ONG et quatre écoles. Dans chaque cas, les étudiants ont travaillé en équipe pour répondre aux demandes d'assistance communautaires. Cet article compare les deux institutions par rapport à quatre des résultats de l'étude de cas. Il décrit comment le concept d'engagement communautaire a évolué et fait brièvement la revue de la littérature sur ledit concept, en particulier dans le contexte sud-africain. Il présente ensuite le cadre théorique et la méthodologie. Les résultats suggèrent que l'approche de leadership adaptatif a stimulé l'appropriation partagée de l'apprentissage.

Introduction

Community engagement (CE) is historically associated with the third mission of universities through various labels such as outreach, community service, service learning and community service learning. These labels all carry with them slightly different meanings. Initially, CE was regarded as a philanthropic exercise by universities towards communities in need. Kruss et al. (2011) and the Council on Higher Education (CHE) (2009) among others explain that CE is now promoted as a mutually beneficial partnership with a range of actors including business and government ministries. The essence of this change in relationship is an emphasis on the co-creation of knowledge and collaboration between university and partnership members (Van Schalkwyck and Erasmus 2011).

The notion of community has also received much attention; it is an all-embracing term that may be geographical, social or ideological. Hall (2010: 23), for instance, describes community as:

> <ext> a cluster of households or an entire region, as an organisation ranging from a provincial government department to an NGO, as a school, clinic, hospital, church or mosque or as a part of the university itself. … Obviously, communities are a loosely defined set of social organisations. But community also functions as an adjective, as a qualifier that indicates work that is socially beneficial. <ends>

Schuetze (2010: 25) describes the concept of community engagement as:

> <ext> the collaboration between institutions of higher education and their larger communities (local, regional/state, national, global) for the mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity. <ends>

The introduction of 'service learning' as a component of community engagement adds a further dimension. This definition has also evolved slightly since the one widely used by Bringle and Hatcher (1995) in the context of the United States, where the emphasis was on how students articulated their learning in communities which would then contribute to accreditation of student programmes, to an arrangement whereby students and communities work together for mutual benefit. An example of this latter definition is provided by Stellenbosch University (2009: 2) as follows:

> <ext> An educational approach involving curriculum-based, credit-bearing learning experiences in which students (a) participate in contextualised, well-structured and organised service activities aimed at addressing identified service needs in a community, and (b) reflect on the service experiences in order to gain a deeper understanding of the linkage between curriculum content and community dynamics, as well as achieve personal growth and a sense of social responsibility. It requires a collaborative partnership context that enhances mutual, reciprocal teaching and learning among all members of the partnership (lecturers and students, members of the communities and representatives of the service sector). <ends>

In the context of service learning, particularly in South Africa, the focus is usually on addressing the needs of marginalized and often impoverished communities that are within travelling distance from the university campus. The impetus for this initiative derives from the nation's post-apartheid efforts to address the inequalities of its divisive history. The responsibility of universities towards community engagement and service learning is enshrined in government policy (DoHET 2013). The ideology of a mutual partnership relationship in these contexts, however, often comes under scrutiny (Hlengwa 2010; Kruss 2012). Service learning requires extensive negotiation and preparation with attention to the inevitable power differentials that surface between an institution with status and resources and organizations or community locations which are targeted on the basis of defined need (Camacho 2004; Erasmus 2011; Preece 2013a).

Much has been written about service learning and the nature of student learning in the community engagement process. Concerns have been expressed about how power differentials are addressed in these contexts (Osman and Attwood 2007; Camacho 2004) and there has been some exploration, and critique, of how service learning is managed as a student-focused pedagogy that also services community needs (Bender 2008; Hlengwa 2010). The community perspective on the engagement relationship has also been discussed (Nduna 2007; Alperstein 2007; Preece 2013b). It is apparent that the very structure of many service learning courses militates against students contributing to lasting change in communities (Mahlomaholo and Matobako 2006). Students often have to manage their engagement activities within a full lecturing timetable and over a defined period of weeks, while community needs and activities do not necessarily coincide with such fixed timetables. Publications that pay attention to the organizational arrangements that facilitate such partnerships and how community learning spaces are created are less common (Preece and Manicom 2014). Comparative, qualitative studies of such experiences are also relatively rare.

This article compares the preliminary findings of two universities' efforts to involve their students in their local community by drawing on the skills and knowledge they obtained from their coursework. Twelve case studies were conducted (eight in one university and four in the other). The case studies were all short term projects lasting between six and twelve weeks. Some of them involved students from dedicated service learning courses; others drew on students from existing degree courses. In most cases the students were required to produce coursework that demonstrated learning from their community engagement project. The notion of service learning, according to the above definition, therefore, was interpreted loosely but required application of

academic knowledge to a community-defined problem. An additional criterion for the students in the study was that they were expected to work in teams, thus requiring a sharing of ideas and understandings between themselves as students as well as in their community placement. The UFS university campus was situated in a rural location; the UKZN campus was located on the outskirts of a small city with access to both urban and rural conditions. For reasons of space, only four case studies are discussed in detail in this article, two from the rural campus and two from the urban campus.

The theoretical concept of adaptive leadership (Heifetz 1994) was adopted as both an overall approach and a lens through which to interpret the findings. This concept was adopted because, in the university–community context, it allowed for a recognition that power differentials are an inherent feature of community engagement and that strategies are necessary to manage these differentials in the engagement process.

Adaptive Leadership

Adaptive leadership is an organizational management term coined by Heifetz (1994). According to Heifetz, Linsky and Grashow (2009: 18) adaptive leadership is

> <ext> The practice of mobilizing people to tackle … challenges and thrive. Adaptive leadership is specifically about change that enables the capacity to thrive. New environments and new dreams demand new strategies and abilities, as well as the leadership to mobilize them. Adaptation relies on diversity. <ends>

Heifetz's (1994: 69–73) theory of adaptive leadership provided a valuable contribution to understanding how communities may be engaged in the process of development. In this theory, different strategies are followed in different contexts or situations. Heifetz discusses three distinct situations leading to leadership responses, strategies and approaches. The first and probably the most common one is the 'Type 1' situation where leaders conclude that the challenge requires only their or their team's technical expertise. Burke (2007: 419) states that Heifetz referred to this as the absence of leadership. In community development contexts, many communities may not challenge the expert's solution. In some cases, the expert may not have understood the situation to the same level as the members of the community would have understood it. At this point, examples of many urban solutions which have been used for rural ecologies bear testimony. A vivid example is the rebuilding of schools in tornado-prone rural areas of the Eastern Cape Province (Mniki 2009).

In the 'Type II' situations, leaders see a problem as requiring some interaction with the community and in so doing view it as a shared challenge that warrants the involvement of the community. This approach, according to Burke (2007: 419), combines the leader's expertise, persuasive powers, and input of the communities. However, this type is characterized by limited leadership.

In many instances, however, leaders and 'experts' do not have readily available feasible solutions to seemingly intractable situations. These are what Heifetz (1994) calls 'Type III' situations. Whilst the communities may remain content with quick, tried and tested easy solutions to their problems, Burke (2007: 419), in relation to this context, calls for an 'honest and courageous leader who would demonstrate the need for redefining the problem, changing priorities, and possibly greater sacrifice from the members'. Although this level of leadership in small scale projects is inevitably limited, the Type III situation provides space for dialogue in university–community or community–university relations. This leads to the need for ongoing clarification of competing roles and responsibilities. It also shifts power relations so that the 'expert' becomes a participant who may, like all members of the community, learn from others. For individuals in positions of power, this may not be an easy shift. Although the problems were necessarily small scale, we sought, through the study, to place students in situations that made them full members of the communities with no better status or credibility than that of the communities with whom they were to engage. Their leadership role, therefore, included encouraging community or organizational participants to 'clarify values and make progress on the problems those values define' as a dialogic process (Heifetz 1994: 5). Heifetz (1994: 25) summarizes this as 'working within society's own frame of reference'.

Heifetz's theory further distinguishes between two types of problems that communities face. Drawing from Heifetz's work Kania and Kramer (2011: 39) refer to technical and adaptive problems. Technical problems are those that are well defined; the solution is known in advance, and one or a few organizations may be able to provide that. Adaptive problems are, by contrast, more intricate and complex; the solution is not known, and no single entity may be able to provide the appropriate service. Educational transformation and health renewal may be classified as adaptive problems. In adaptive leadership it becomes extremely important for the leader to be fully 'present' to comprehend what is happening with a view to framing key issues and questions from within the social group. A facilitative, inclusive approach is key to ensuring lasting impact (Heifetz, Grashow and Linsky 2009; Eubank et al. 2012: 243). This is in line with Kania and Kramer's work titled 'Catalytic Philanthrophy',

where they make reference to the fact that mobilizing multiple organizations and stakeholders may be messier and slower. For example, a rural community may decline a particular process because it does not augur well or resonate with their ways of existence, unless they are given the opportunity for shared ownership and understanding of change.

An adaptive leadership approach may challenge and inspire students and afford them the opportunity to lead and stimulate change in community contexts by adopting context-sensitive strategies for dialogue and mutual problem solving. This requires stepping out of their everyday environment, gaining insights into a range of social issues and 'reframing' their challenges through a process of community engagement. It also entails developing a greater understanding of group dynamics and increasing awareness of one's own behavioural patterns and how they impact on others (Adaptive Leadership Intensive 2013). It is a trust-building process whereby a diversity of views is respected (Heifetz 1994). Since community projects are often multi-layered in terms of relationship structures, this action research project and its academic facilitators encouraged students to engage with those multiple levels of participants in their projects. In summary, the focus was on encouraging community ownership of the engagement initiatives, ongoing dialogue to clarify competing goals and values, and sensitizing students to the need to respect and value diverse community perspectives with a view to contributing to community-identified development challenges. Community engagement relies on these adaptive leadership principles, and in their service learning, students were encouraged to apply these principles in their community engagement projects. As students and university lecturers engage with and serve communities, they need to observe these principles. For example, communities need to feel that problems and solutions are theirs and not those of the students and/or lecturers.

Methodology

This was an action research project because it was more than simply a data collection process. The research focus was on improving what exists by exploring what works and what could be improved, listening to the views of all partners and taking action to address the challenges raised (Stringer 2004). The project went through four phases. They were as follows:

Phase 1: Consultation with relevant organizations and academic departments to match potential students with relevant disciplinary knowledge to the community-identified problem or task.

Phase 2: Discussions between organizations and students in preparation for the task.

Phase 3: Ongoing monitoring by research assistants and researchers during the case study phase, followed by interviews and focus group discussions with all participants (staff, students, NGO organizers, participating community members).

Phase 4: Feeding back our findings to the participants and discussion of ways forward.

The case studies themselves emerged after several consultations with different NGOs following a public stakeholder meeting at each institution. It was a process of trying to match 'this' problem with 'those' students and negotiating how the student's timetable constraints could interface with the timetable demands of the participating community organization.

Ethical clearance was obtained from each university; all organizations gave permission for participants to be interviewed and each individual interviewee signed an informed consent form that promised anonymity whilst allowing the researchers to record and publish findings. Interviews with key community participants and students took place either individually or in focus groups, depending on which process was deemed most appropriate for obtaining honest and frank answers (Krueger and Casey 2000). In each case community members were interviewed in their preferred language (Sesotho in Qwa Qwa and isiZulu in KwaZulu-Natal) and the digital recordings were transcribed into English.

The research questions relevant to this article were:

1. How did the communities, university staff and students engage with each other?
2. To what extent did the adaptive leadership philosophy contribute to the engagement relationship and its outcomes?

Transcripts of interviews and focus group discussions formed the main source of data, though field notes on the preparation phases were also available. The precise form of data collection varied across the case studies according to the circumstances of the participants through what Barton and Tusting (2005) have called 'responsive methodology'. Transcripts for each case study were scrutinized by their respective university research teams for patterns of responses and then coded thematically, drawing on the adaptive leadership framework as an evaluative tool for analysing the data. The cross comparison of findings took place during university team meeting discussions at subsequent conferences during 2014. This entailed a process of verification, cumulation, generalization and application (Schweisfurth 2001: 219) whereby common criteria were used for the engagement process, as stated through the adaptive

leadership approach, and then the cases were examined in relation to what was happening at micro-level in order to gain 'insight rather than overview' and generate patterns that could inform our analytical understanding across all the cases. For reasons of space only two case studies from each institution are discussed here. They are introduced under their separate university headings.

The Case Studies

University of the Free State, Qwa Qwa campus

In the first case study an NGO requested student assistance in conducting awareness raising workshops with parents in order to improve their children's literacy levels. Two meetings were held to discuss ways in which the students could be placed with the organization. After the second interaction between the researchers and two representatives of the NGO, a workshop was conducted to train the students to conduct workshops with parents. The coordinators from the NGOs contacted the school where workshops would be held by the students after the training session. Nineteen students conducted five workshops in Sesotho, the local language.

The second case study did not have an NGO to mediate between the university and the school. In 2013 a school teacher asked the university for student assistance in the teaching of Mathematics, Social and Natural Sciences in two grade nine classes. Nine university students were tasked to teach on Saturdays.

Separate focus groups were held with the university students and teachers from the school. For the literacy programme, a focus group was conducted with both university students and school parents who participated in the workshops.

University of KwaZulu Natal, Pietermaritzburg Campus

Both projects took place over a period of six weeks. The first project involved two isiZulu-speaking political science students in making a film on poverty and hunger in the wider Pietermaritzburg area**.** The lead NGO worked with a local film-making organization to produce the film.

Students assisted with logistical preparations such as liaising with the various households about filming times, dates and requirements and passing this information on to the NGO and film making crew. Students then acted as translators between the crew and the community and vice versa.

At an initial meeting between the NGO, the film crew and students, the NGO director led the discussion on the envisaged role of the students and the nature of the project. Times and days were negotiated. At the end of the six week period, the two students and the NGO director were interviewed regarding the benefits and challenges of the service learning experience.

The second NGO trains local members of a semi-rural township to facilitate morning crèche activities with pre-school age children whose families cannot afford the fees of a formal nursery school. Parents are encouraged to attend and join in the nursery activities, though they rarely do more than observe. Two third year students from the education and development disciplines met in the township with the NGO's trainer, the local coordinator and the early child development facilitators to receive some training on the kind of activities that might be employed to support one of the crèche facilitators.

At the end of the six weeks, the students, facilitator, coordinator and two observing parents were separately interviewed for their assessment of what benefits and challenges the arrangement had revealed.

The findings for all four case studies are presented in terms of key themes that emerged and could be relevant for leading adaptively: building on community assets, paying attention to power differentials, dialogue, shared learning and stimulating change. Respondents and case studies are categorized as follows:

Project	**Students**	**Community member (parent)**	**Com-munity facilitator**	**NGO contact / teacher**
Early child develop-ment CS1	S1, S2	P1, P2	CF	NGO
Film-making project CS2	S1, S2			NGO
Literacy project CS3	S1, S2 etc	P1, P2 etc		T1, etc
Maths and sciences project CS4	S1, S2 etc	P1, etc	CF	T1 etc

Findings

Building on Community Assets

The students took their responsibility seriously, recognizing the existing knowledge of communities, and learned to respect the contributions that community members were making within their own environments, even when it appeared that assets were limited.

> <ext> The role they [community facilitators] play is … a very empowering role … even though they know that they have nothing at all in life but they see that they can do something with their lives … the parents

> of the children they are teaching trust them … even though they know that they are not qualified teachers (CS1, S1). <ends>

Similarly, with case study 2 it was evident that because NGOs work closely with communities on the ground they are aware of the issues confronting communities. The NGO director explained the organization's approach to community knowledge and to creating awareness of community issues at different levels of involvement:

> <ext> So there are two levels: the level on which the film is telling the story through the eyes of the community people, but [also] external people who have knowledge on the context of food prices (CS2, NGO). <ends>

In the literacy project the students learned from the parents how to handle learners, so that in order to motivate children to do better; the children's responses have to be handled with decency:

> <*ext*> I also learnt that you have to address your child in a decent manner. Attempt to use different strategies to help the child discover the correct answer. Do not say the child is stupid [dumb] as this may make or break the child's future (CS3, S1). <ends>

This included encouraging children to aspire to greater heights in life:

> <ext> As a teacher you need not be negative when you ask learners about their future careers. You should encourage the child to work harder (CS3, S2). <ends>

At the same time, in the spirit of adaptive leadership and in recognition of the power differentials between a university and a community setting, students were asked to comment on how they managed to address that challenge.

Paying Attention to Power Differentials

The early child development project students revealed it was not always easy to gauge how to interact with their facilitator:

> <ext> This was a learning curve that this [project] is their baby so we were afraid to raise some points because maybe she would take it as

> though you are undermining her position. That was also a challenge for us (CS1, S2). <ends>

This meant that they had to find ways of introducing new ideas that did not alienate her. So they learned to imagine how the facilitator might feel and be sensitive to her context:

> <ext> What I learned was the facilitators they take this job very seriously, it is kinda like it's their baby and if someone else from the outside tries to intrude somewhere … you are attacking them personally so … if you want to intervene … do it in a way that … does not seem as if you are attacking them, in a way that we are here to learn (CS1, S1). <ends>

And slowly they built a relationship whereby each would support the other:

> <ext> We were second facilitators … but we were not superior to her. We tried to work as a team with her … she would let us do our thing and she would continue with her thing. So we tried to play the same role as her even though she is the more educated one when it comes to ECD and children … but in the eyes of the children … we were also their teacher … she would say 'these are your teachers' (CS1, S2). <ends>

The students in the film project recognized that they were dealing with several layers of participants but that the main decision-makers were the film-making company:

> <ext> our focus was on the communication and logistics stuff so to write appointments and stuff so [NGO] and the film makers would actually make the big decisions and what we actually did was ensure that everyone was available, you know. Perhaps if they were not available on Tuesday then we would have to settle for another day which was gonna accommodate everyone of us and ensure everyone is there and not left behind so they took bigger decisions like for [film crew], they are the film makers they are the ones shooting so we can't agree on a day on which they are going to deal with something else, we have to hear from them if they can come (CS2, S2). <ends>

Both the literacy project students and the community parents learnt something from their collective participation. Learning from one another balanced unequal power relations. It was not only parents whose patience was tested; students also felt that the project enhanced their ability to manage patience:

> <ext> As university students, this project assisted us to gauge our patience towards people (CS3, S1). <ends>

Parents also appreciated university students' demonstration of love and respect:

> <ext> We appreciate the respect (CS3, P1).
> We thank you people [university students]; we thank you very much (CS3, P2). <ends>

A key ingredient for ensuring such a positive working relationship was to engage in dialogue.

Dialogue

This process of building constructive dialogue took time. At first for the students in case study 1, their efforts appeared to flounder. For instance, they built on the trainer's advice to bring in plastic cartons to use as resources for the children, but did not realize that the facilitator would not necessarily have the skills to develop these resources:

> <ext> We didn't know how to do certain things with her [the community based child development facilitator], how do we engage with her in doing something because … we took the plastics to her and said here are the plastics what should we do? … and she was like 'eish I don't know as well'. (CS1, S2) <ends>

It then became apparent that ideas must be introduced slowly and with time to allow for clarification and competing agendas. Most importantly this required an opportunity for all participants to respond and get used to new ideas:

> <ext> What we learned … if we have ideas that we want to implement … inform her that okay, we are thinking of this, to do this, is it alright? So that the other person is in the loop … by the time we arrive she knows already that this is what's going to happen (CS2, S1). <ends>

The students from the film project commented on the ongoing dialogue that happened between all parties to make the project work:

> <ext> Well in terms of making decisions we all discussed it, there were emails, when we see each other. Like they worked around our time and we worked around their time we all compromised something in like, ja. And then we contributed by availing ourselves or trying to work around each other's time like we couldn't clash, if you get what I am saying . We all compromised time and whatever (CS2, S2). <ends>

The UFS students who were placed in the literacy booster project commented that they were able to discuss with parents and teachers and as a result they could work with other students whose perspectives, regarding certain issues, were different from theirs. 'My answer should not be the only correct answer', said one student. In conducting workshops, students complemented each other's presentations:

> <ext> If I were to do the seven sessions alone, it would have been impossible for me. Because of the other members of the team, it is now possible and enjoyable (CS3, S4). <ends>

Furthermore, in the initiative where grade nine learners were taught by the students, the initial dialogue made students realize the need for personal sacrifice in terms of time. They learnt the need to keep a balance between their academic work and the community engagement requirements:

> <ext> It was sometimes a challenge. You will find that sometimes you would be writing on Monday, and sometimes you are given material on Friday to prepare for Saturday (CS4, S1). <ends>

He explained that because of the initial discussion to help the learners, they were continuing with their university work after classes:

> <ext> After the lesson you will have to come back and continue with the university academic work (CS4, S1). <ends>

Most importantly, the discussions between different community members ultimately provided opportunities for shared learning.

Shared Learning

A key outcome of the dialogue which engaged in clarifying competing values and purposes was the opportunity to build on each other's knowledge base. So, for instance, the local child development facilitator in the UKZN case study realized the benefits of new ideas, especially when she was allowed to steer the intervention in a way that recognized her knowledge of the children and their learning abilities.

> <ext> If they have an opinion they would share and I would also do the same when I had an opinion about the children … see they are also educated – they came with the shapes and the robots ... [but] this one day they finished with shapes and proposed to teach them about robots. We told them no, they shouldn't – these children are still young, they shouldn't learn everything at once in a day (CS1, CF1). <ends>

Within the space of six weeks both students felt they were learning:

> <ext> I gained an understanding that children don't learn in the same way as adults and that children learn in a slow pace and that you need to be patient … also kids learn things better if its visual … it must be … colourful and bright (CS1, S1). <ends>

And the facilitator felt she was working in a partnership relationship:

> <ext> We had different ideas and worked in a good partnership … we used to discuss things; agree that they can take over now. They would tell the story they prepared and I would also tell some of their stories that they've told (CS1, F1). <ends>

Students from the film project learnt directly about poverty and its effects on people, issues that they were dealing with in their university courses which contributed to their linking theory to practice:

> <ext> There are things we aren't aware of as I live in a kind of incubater-ish community, ja. Yes I did gain some information … like on Saturday when the participants are actually talking about their situations you could see that some things went beyond hunger and everything and it was more psychological, ja you could just read it through their body language so it affected them more than, so it did go with my psychology module [more] than my with my politics module (CS2, S1). <ends>

Another student explained further that this experiential learning is powerful and can be emotional:

> <ext> It hit me hard emotionally; I think that I put my heart too much into it. I learnt that that it could be visible to society that a certain household is coping…. But in that household things are going wrong that nobody can see. People go days without eating and yet they still work (CS2, S2). <ends>

From the perspective of the NGO director he felt that they also learnt from the students from the project because the dialogue between participants' knowledge was shared:

> <ext> It also helped us from the point of view of, mmm, the students themselves because they sometimes suffer the same issues that the people in the community suffer they helped to bring also another dimension of understanding of food insecurity to the script … so because they also took part in the discussion, they also said things which was quite interesting stuff, like what is happening at varsity and how there is hunger in hostels (CS2, NGO). <ends>

In the literacy project one single-minded student reported that she had acquired the knowledge and skill of discussing and working together with people of opinions different from hers. She said that she had learnt to work together with other people and accommodate views different from hers:

> <ext> I also learnt to take other's points of view into consideration; I should not be the only one who enjoys prominence (CS3, S5). <ends>

As for the maths and natural sciences case study, our findings revealed that the students were able to link what they were taught at the university to what they were expected to teach at school. The students further experienced that in some instances the university's programmes were not preparing them sufficiently for the workplace: 'When it comes to Geography there is little map work that is being done', commented one student, 'so that places a lot of pressure on us as students when we are in the field. We struggle because we were not equipped well on that part'. Two other students shared similar sentiments:

> <ext> From the first year to the third year, we haven't learnt anything about map work. We started learning when we were looking at the

> method of teaching Geography. Luckily, we got some information from one high school so that we could know the formula to calculate the gradient (CS4, S3).
>
> We were provided with textbooks with no information on the topics to be presented. For an example, we were to teach about the gradient. But only to find that there is no information about the gradient. I then went to Mr Vxxx at S Secondary School. I asked information about the practical. He provided me with the topographical and ortho-photo maps. This made the practical to be possible as some of the calculations were to be taken from the map. We found that at the school there were no maps. We tried to download some maps from the internet, but we could not get the correct one. So I have learnt that if I am given a topic to present I need to search for some information instead of folding my arms (CS 4, S4). <ends>

An important concern of adaptive leadership is the application of such strategies to stimulate change. The projects were small-scale and it was difficult to assess the extent to which lasting change might have been implemented. Nevertheless there were signs that the students were keen to introduce change and in most projects there was evidence of change in attitudes at community level, albeit tentative at this stage.

Stimulating Change

The parents involved in the UFS literacy project began to recognize a number of ways in which they were able to assist their children. This included working with other children in addition to their biological children.

> <ext>I am able to assist other children other than mine (CS3, P1). <ends>

Some affirmed that they were better able to care for their children after participating in the initiative:

> <ext> I did not have that patience for children. Now I am no more impatient with them (CS3, P3). <ends>

Others felt they were now able to assist their children, taking them step-by-step:

> <ext> I read and guide my child. When she asks questions I respond. She did not know the meaning of the word 'hygiene' and I explained it to her (CS3, P4). <ends>

Parents also recognized that they should create time to be with their children in order to assist them when doing their homework:

> <ext> If there is anything I am doing, I immediately leave it and assist my children if there is a need (CS3, P5).<ends>

Many parents pointed out that they were able to assist their children at home:

> <ext> [even with homework] I now understand that the child does not only need to be taught at school, but at home as well (CS3, P1).
> I am now able assist my child to hold a pen, as I have been taught to do so (P2). <ends>

They demonstrated that they were now using a variety of strategies to make learning fun:

> <ext> I did not present what I was reading in an interesting manner, without actions. That is why the children were bored because I was just reading (P6). <ends>

The project also created a bond between parents and their children. Parents said that they were now able to discuss matters that they were unable to discuss before participating. For example:

> <ext> There were things I could not discuss with the children but now I can. The children find it easier to approach me now. This change seems to have cemented the relationship I have with my children (P3). <ends>

In the early child development project, from their own perspective the students felt they introduced new ideas:

> <ext> Since we are students … I think we have like more, fresher ideas of teaching children compared to the facilitators there; even though it was threatening but then we had fresher ideas. We had new ways of implementing the teaching … we tried to have more fun ways of learning for the kids (CS1, S1). <ends>

The facilitator felt both empowered as a facilitator and, as a result, that her role was being taken more seriously by the children's parents. The very fact that

university students were taking part in the project had created a new power dynamic that gave the it new legitimacy:

> <ext> We were very happy to be with you [students] and the children also saw – and I also saw that I am also important … the children and parents saw that this is a legitimate thing … we wish that you people could come back again because your presence has been noted by the parents.... Your presence helped because some parents thought this was just a game. Some even refused to allow their children to come … now they saw that this thing of teaching from home is serious … because of the students that came and brought some of their things as well and they saw (CS1, CF). <ends>

In support of this change of attitude, the parents indicated increased interest in the idea of playing a supportive role in their children's crèche. Although this may simply have reflected a desire by the parents to please the interviewer:

> <ext> No I haven't played any role [in the crèche] … but now that you have asked me this you have motivated me to start taking part (CS1, P1). <ends>

… there were indications that the parents were now taking a closer interest in the learning needs of their children:

> <ext> I say UKZN did a very good job because the arrival of the two girls made ... how do I put this? The work they brought with them was a little different from what the teacher had. They came with shapes, taught triangles, square and circles … things they've [the children] have never done ... it was a beautiful thing and they understood it and know it. They [students] also reward the children. When a child did well they gave him/her a star. You see things like that encourage a child (CS1, P2). <ends>

The facilitator, too, indicated a greater willingness to try out new ideas:

> <ext> You [students] have played a massive role, for example you brought us posters that will assist us when we are telling a story to the children; you also helped us with the shapes that you made for us to show them what a shape is and how it looks (CS1, CF). <ends>

The NGO director of the film-making project felt that because of issues that students raised about student hunger that:

> <ext> They [students] enriched the process through their thinking engagement … I could see a possible connection for this for not this year but later on in the year because I have friend of mine in the university who is working on issues of hunger in the hostels so mmm, it might lead on to something like perhaps another DVD or something (CS2, NGO). <ends>

The director was also hopeful that the film produced during this project would be a catalyst for change in the lives of the community:

> <ext> If this film can get a wide audience and can get a conversation going within a sitting about this phenomenon, about hunger, inevitably different role players would have to start doing something about it. Mmm, it becomes a social justice movement (CS2, NGO). <ends>

Discussion

Each project entailed similar strategies for organizing the service learning initiative. For instance there were several preparatory meetings between the students and community organizations. Sometimes there were two layers of participation, such as between academic staff and students and the initiating organization. Occasionally there was a third layer of participation, such as for the early child development and literacy projects where the NGO acted as a mediator between university and community facilitators. But the project 'beneficiaries' – at community grass-roots level – were only involved at the evaluation interview stage. This signifies that in these case studies the community engagement relationship remains embedded in a partnership for development 'for' rather than 'with' the community at grass-roots level. The partnership 'with' relationship is with a mediating NGO or school. Such an organizational strategy is perhaps unavoidable for short term service learning projects but it does highlight a potential limitation for community engagement partnerships that aspire to contributing to community change.

Nevertheless, the community-based learning spaces provided opportunities for students to understand the context-specific challenges of Heifetz's (1994; Burke 2007) Type III problems where there are no easy technical solutions. A prime example of this adaptability in action was evident in the natural sciences classes where students had to use their own initiative to acquire the necessary

practical resources. At the same time the community spaces provided a unique opportunity for shared learning whereby nearly all the respondents shared how they had learned from each other. This suggests that the non-formalized nature of community environments creates a resource for collective learning whereby new relationship dynamics and forms of dialogue take place. Within these spaces students and community members learn to recognize the value of pooling assets, skills, knowledge and understanding. Within that process of informally re-framing key issues and questions and facilitating learning for mutual problem-solving, students had to step out of their everyday learning environment and build trust with their diverse community contacts (Heifetz 1994). The follow-up interviews indicated that the students had contributed to stimulating change amongst community members, particularly in the projects involving children, but also at NGO-level in relation to the food security film-making project.

On the one hand, therefore, these case studies indicated the potential of an adaptive leadership approach to contribute to community change through small-scale service learning projects. They also indicated the need for extensive preparations prior to the engagement activity and the limitations of what can be achieved in terms of working with grass-roots communities – unless a mediating organization can maintain continuity after the student interventions. The extent to which change is sustained could not be ascertained in these case studies in view of the time limited nature of the research study. Nevertheless the comparative element of these four case studies can produce some tentative conclusions.

Conclusion

Each university focused on different contexts but the process of adaptive leadership produced similar outcomes in terms of facilitating shared ownership and development of knowledge which builds on community assets, and is sustained through a process of dialogue. This relationship in turn stimulated motivation for change among students and community members. In such diverse and multi-layered community contexts there is a need for constant vigilance regarding power dynamics between university and community levels. But often this power differential can have positive effects in that the very presence of university interest in community initiatives can stimulate a sense of self-worth and self-respect, which in turn motivates enhanced community activity. However, in order to maximize such potential there must be ongoing dialogue and respect for diverse views.

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Creating Sustainable Learning Environments for Professional Curriculum Leadership through Information and Communication Technologies

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Abstract

This paper documents the processes and procedures followed by a team of two researchers and five co-researchers in the creation of sustainable learning environments at a school in the Free State province of South Africa. For this purpose, we used one school to illustrate how diverse school community members deliberately constructed a framework for the integration of ICT in the development of its professional curriculum leadership practices. A conceptual framework driven through critical emancipatory theory is applied as the lens that propels us to create opportunities for self-empowerment. Grounded on this theoretical framing we then used a participatory action research to operationalize it. We generated relevant data through the establishment of a research team, which coalesced around a common vision collectively identified in pursuance of the aim of study. Data generated were analysed using Van Dijk's critical discourse analysis. The findings discussed are (i) performance through reflecting on professional curriculum practices, (ii) their actions, (iii) procedures involved therein, and (iv) strategies. The contribution we made was a tested framework for the integration of ICT in a professional curriculum context. This contribution has implications for the creation of a sustainable learning environment.

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Résumé

Cet article décrit les processus et les procédures suivis par une équipe de deux chercheurs et cinq co-chercheurs dans la création d'environnements d'apprentissage durables dans une école de la province de l'État-Libre d'Afrique du Sud. A cet effet, nous avons utilisé une école pour illustrer la façon dont divers membres de la communauté scolaire ont délibérément construit un cadre pour l'intégration des TIC dans l'élaboration de ses pratiques de leadership des programmes professionnels. Un cadre conceptuel conduit à travers la théorie critique émancipatrice est utilisé comme angle d'analyse qui nous pousse à créer des opportunités pour l'auto-émancipation. Sur la base de ce cadrage théorique, nous avons utilisé une recherche-action participative pour le rendre opérationnel. Nous avons généré des données pertinentes à travers la mise en place d'une équipe de recherche, unie autour d'une vision commune collectivement identifiée pour l'atteinte de l'objectif de l'étude. Les données générées ont été analysées à travers l'utilisation de la technique d'analyse critique du discours de Van Dijk. Les résultats présentés sont : (i) la performance à travers la réflexion sur les pratiques des programmes professionnelles, (ii) leurs actions, (iii) les procédures y afférentes, et (iv) les stratégies. La contribution que nous avons faite était un cadre testé pour l'intégration des TIC dans un contexte de programme professionnel. Elle a des implications sur la création d'un environnement d'apprentissage durable.

Introduction

The trajectory of this study was kindled by an invitation extended to us as members of the local community by the school leadership. We took advantage of our contractual obligation on community engagement and agreed on a common goal. We genuinely accepted the invitation due to our long-standing relationship with the school as scholars from a local higher education institution (HEI). The troubling feature in the school was declining and inconsistent leaner attainment, negotiated amongst a deputy principal and four heads of department as the school leadership responsible for academic performance. Our goal was to intervene through the integration of ICT in a professional curriculum leadership practice. The National Department of Communication acknowledges that technology is a critical element in the development of the economy and the department is thus driving a vision that will provide every South African with easy access to the internet through broadband and wireless network connections (Lesame 2013: 4). In this regard, the late Minister of Communication, Roy Padayachie, developed Vision 2020. He argued that the throughput of learners from primary and high schools to universities is a form of exclusion of the vast majority of people from access to ICT because not every learner has the privilege of entering the science and technology

stream. One of the eight Millennium Development Goals adopted by the South African government includes the use of technology as a priority. This goal has been mandated internationally and involves improving basic education in Africa as well as ensuring participation in the global world by all major stakeholders at various levels of society (Tsephe 2008: 257). All the initiatives listed above demonstrate the need to ask questions about how leadership in the use of ICT can be provided and about who will provide such leadership in schools. These questions propelled us to conduct the study, the background of which is outlined below.

Background

Since the 1950s and 1960s – the era of large mainframe computers – a great deal of research has been conducted on the effects of computers on learner achievement and how teaching and learning can be improved in this regard (Rebore 2011: 17). It is suggested that worldwide, school leaders, particularly principals, need to be equipped to integrate ICT into their administrative duties.

We did extensive reading regarding this topic, which serves as the foundation of the research process. On our reflections, we identified a large number of research studies on ICT and on the general role of the school principal. Examples of the implementation of programmes to initiate ICT in secondary schools reported in the literature include that of the Centre of Informatics at the University of Eduardo Mondlane in Mozambique, the Russian Ministry of Education, and the Embassy of the Netherlands' World Links for Development Programme and the Acacia Program of the Canada-funded International Development Resource Centre. However, these initiatives were threatened by a lack of leadership for ICT implementation (Mbangwana 2008: 2). The World Bank urged African countries to seize the opportunities offered by the information revolution, or be crushed by it (Zoho 2004: 1).

Hayes (2007: 392) argues, in *Lessons from Australian classrooms*, that strong, coherent leadership is of the utmost importance for ICT implementation. Interviews conducted with teachers by Mentz and Mentz (2002: 3) identified a high level of awareness among teachers of the way ICT can enhance the quality of teaching and learning, although the implementation of ICT is hampered by a lack of policy and action plans on the use of ICT, both at school and national levels.

The research plan for the current study draws on numerous research reports on the way schools can go about implementing the use of ICT. The literature clearly points to a need to focus on leadership training and ICT programmes, so that teachers can use ICT daily; however, the government has not yet been able to implement ICT in South Africa successfully (Franssila and Pehkonen 2005: 9).

Mentz and Mentz (2002: 1) created a sound foundation for research on managing challenges facing the integration of technology in schools in developing countries, especially in the South African context. They suggest that school principals play the primary role of shaping the communication-related vision of teaching and learning within their schools.

According to Mulford (2003: 3), recent research indicates that:

- position-based leadership, meaning the leadership role as an input factor, will always have an impact on learner output;
- leadership contributes and influences how learners perceive teachers' contributions to their studies; and
- collective teacher efficacy is a direct variable in the relationship between leadership and teachers.

Furthermore, one of the contextual roles of school principals is that of being scholars, researchers and lifelong learners (Brunton and Associates 2003: A-51).

Most of the research on the implementation of ICT has been done in developed countries and may not be wholly applicable to the South African context. We believe that ICT can be a valuable resource in South African schools, the Department of Basic Education (DBE) and the broader educational field. The rapid expansion of ICT in the world, and its use in all circles of work and daily life, have dramatically changed the way we live, the way we conduct business, the way knowledge is constructed, and the way we socialize and share information (Lim, Chai and Churchill 2011: 69). The question thus arises: if ICT has such a serious impact in the world, what is the situation in the twenty-first century school? It is in response to such questions that this study aims to design a framework that could be used to enhance the curriculum leadership role of principals in the usage of ICT in teaching and learning. Meeting this challenge, especially in township schools, requires an understanding of the curriculum role of the principal.

Professional Curriculum Leadership Role

The Personnel Administrative Measure (PAM) explains the role of the principal as being responsible for providing professional management and leadership in the school as well as guiding, supervising and offering professional advice on the work of all staff members. The principal is also responsible for confirming reports on teaching, assisting teachers (particularly novices) to develop and achieve educational goals, appraising and regularly reviewing professional work with the aim of improving teaching and learning and personally engaging in teaching (Brunton and Associates, 2003: C-2; Hindle 2007: 4).

In some schools in South Africa, particularly in the Free State and also in Mangaung Township where the study was conducted, the curriculum role of the principal in the use of ICT is neglected by some curriculum leaders. Their daily focus is more on administration and management of general matters, such as leave administration and problems such as drug abuse and absenteeism. In the case of some principals, their knowledge of teaching has become outdated because they are not actively involved in teaching every day and some avoid ICT completely (Lunenburg 2010: 1). Lai and Pratt (2004: 470) argue that some principals seem to have inadequate knowledge of the use of ICT in school due to a lack of interest in ICT. In some schools, there are no plans for using ICT. For instance, principals focus the attention on grade 12 pass orientation practices, devoting little time to quality teaching and learning, particularly using ICT (Fink and Resnick 2010: 2).

Although private institutions have given some support to curriculum leaders by providing resources such as learning channels, free licences for Microsoft products, and SchoolNet support programmes, some school timetables are not linked to the programmes on the learning channel and the SchoolNet programme, because some principals do not see the relevance of padding the school timetable with these televised programmes. Many principals lack the necessary support from district officials or are not sure about the type of support they need to be successful in this regard (Bialobrzeska and Cohen 2003: 7).

Increasingly, principals are required to assume leadership responsibilities regarding ICT usage in schools as an area with which they are unfamiliar. Many principals face challenges such as lack of access to ICTs, lack of electricity, lack of pedagogical knowledge on ICTs, inadequate technical skills, lack of software, inadequate knowledge of learning management systems, unfavourable geographical locations and unavailability of broadband as well as low levels of ICT training in their schools. They also face social problems (e.g. theft), poor economic conditions, little support from the school community, poor infrastructure, and low commitment and willpower on behalf of the principal (Korpelainen 2011: 1). These challenges pose threats for the design of the envisaged framework that was the core of the investigation in this study.

The rapid introduction of numerous policies in South African schools post-1994 has resulted in a great number of educational changes taking place in schools (Yee 2006: 288). It is essential for school leaders, as the drivers of change, providers of vision and developers of initiative in the use of ICT, to cope with these changes.

Although Russia and countries such as Nigeria and Botswana have embarked on ICT leadership research, they are also still experiencing challenges. In Russia, for example, the implementation of ICT began in the early 1980s,

but Kiryukhin and Tsvetkova (2010: 31) report the following challenges: a lack of ICT resources especially for classroom use and a lack of specific training for teachers who are expected to teach computer classes. Furthermore, learners do not have strong motivation to choose a career in technology.

The same situation has been observed in Nigeria. Olawale et al. (2013: 74) report fifteen problems militating against the use of ICT in that country. The major problem (among others) is that computer usage, internet access and other ICT tools are limited to urban areas as well as the fact that the people in rural areas are yet to learn how to use computers.

Similarly, in Botswana Totolo (2007: 34) suggests that school principals need to change their leadership styles to be transformational in the information era. Many principals have not been prepared for their new role as technology leaders and therefore struggle to develop both the technical and human resources necessary to achieve ICT outcomes in schools.

The World Summit on the Information Society (WSIS), held in Geneva in 2003, identified the need to capacitate half the people in the world (with the exception of babies and the elderly) to have access to ICT by 2015. However, today few people in the world have access to ICT, leaving the majority, who do not have access to ICT, marginalized. In Canada, the mandate of principals is to prepare all learners, from kindergarten to grade 12, to understand, use and apply technology effectively and in an ethical way – a mandate that has not yet been realized (Flanagan and Jacobsen 2003: 124; Yuen, Law and Wong 2003: 161; Hayes 2007: 392).

A few African countries, such as Botswana, Ghana, Kenya, Namibia, Zambia and South Africa, are forging ahead with trial projects supported by pan-African programmes of the New Partnership for Africa's Development (NEPAD) for ICT initiatives. NEPAD schools, however, are still battling to implement ICTs (Farrell, Isaacs and Trucano 2007: 26; Ryan 2006: 142). In South Africa, for instance, the White Paper on e-Education (RSA 2004: 17) states that

> <ext> every South African learner in General Education and Training (GET) and in Further Education and Training (FET) bands will be Information and Communication Technology (ICT) capable by 2013 (Bialobrzeska and Cohen 2003: 7; Fink and Resnick 2010: 2; Lunenburg 2010: 1). <ends>

Schools have been provided with computers, principals and teachers received ICT training, and the Laptop Initiative was undertaken. The White Paper set the goal that teachers would be ICT compliant by 2010. However, this had not been achieved by 2015.

A model that is widely used by researchers (Van Wyk 2009: 32; Mentz and Mentz 2002: 1) and the South African Institute for Distance Education (SAIDE) is the Technology Acceptance Model (TAM), which suggests that for technology to be used it must first be accepted by users. However, the model does not take into account conditions experienced in the majority of countries, since it is based on affluent countries (Flanagan and Jacobsen 2003: 123). This constraint on the model is also articulated by Harris, Kumar and Balaji (2003: 14) and Donnelley and O'Rourke (2007: 33).

The SAIDE project produced a guide for principals in 2003, *Managing ICTs in South Africa*, in collaboration with representatives from SAIDE, the DBE in the Western Cape, Multichoice, SchoolNet SA and two principals. Guidelines for the training of educators were also published in 2007 (Hindle 2007: 1). The training of principals has been rolled out since 2008 through the Advanced Certificate in Education (ACE) leadership courses presented at several higher education institutions. Although the first cohort of principals has completed training, there remains a lack of ICT leadership in schools. This is our rationale for pursuing a study to find ways to enhance the leadership role of the principal in the use of ICTs from a new theoretical perspective. A clear conceptual framework is the fundamental starting point of this endeavour.

Conceptual Framework

This study is positioned in a conceptual framework that views the improvement of contemporary teaching and learning as dependent on the use of ICT, which can strengthen learning and can be influenced by the professional curriculum leadership role of a principal in a school. This conceptual framework is shaped by the community cultural wealth approach of Yosso, the system models for measuring ICT integration in teaching and learning, and the critical emancipatory research (CER) theory developed from Habermas and the Frankfurt School of critical theory (Lin, Wang and Lin 2012: 97; Luna and Prieto 2009: 217; Mahlomaholo 2009: 13). This framework informs our belief and involves the following:

- Teaching and learning content that focuses on a particular area of the curriculum that learners might normally find difficult can be simplified by using ICT. Some schools do not have laboratories; however, teachers and learners can use videos or CD-ROMs, or can download some of the experiments from websites to illustrate their lessons.
- Second, this study could use ICTs available in the school community that are underutilized. Though it is understandable that ICT alone does not enhance learning, it can help learners to progress in a sustainable and enjoyable way with the same avid concentration and commitment

they exhibit for computer games (Ellis 2013: 104). Cell phones can also be used to teach and learn optimally.

- ICT could trigger changes in activities, curriculum and interpersonal relationships in the learning environment, in which the socio-cultural setting and cognition shape and are shaped by ICT tools.
- Integrating ICT into teaching is not something that can be forced upon teachers. The more freedom teachers are allowed, the more likely they are to try it.
- The contemporary teacher is a global citizen whose agency is critical. Teachers should be permitted to become agents of change.
- A critical-leader approach seems to be more suitable for influencing teachers to create communities in a learning environment, in which both learners and teachers use a range of ICT tools to co-construct knowledge.

Methodology

This study adopted participatory action research (PAR) as a methodology to generate data because it complements critical emancipatory research (CER) as the fundamental lens used in the study. PAR tenets are geared towards empowerment and are emancipatory in nature (Zuber-Skerrit, Wood and Dick 2013: 2; Eruera 2010: 1; Hawkins 2008: 2). The leadership role of the school principal in the use of ICTs was the primary context for the data-generation process of this study. The leadership role was the fundamental focus and helped to move the study away from the dominant discourses about the role of principals. The dominant discourses assume that school management and leadership are controlled, controllable, instructive, predetermined, uniform and predictable. This argument is biased towards the human and social contexts, because leaders are human and operate in a social context (McNamara and McNamara 2011: 33; Mattsson and Kemmis 2007: 196).

PAR is relevant for this study because knowledge is socially constructed and should be co-constructed with participants (Eruera 2010: 3).

Therefore, leadership cannot be detached from followership, which is about the human agent. Thus, an attempt to show respect to human agency remained the core compelling reason for applying PAR in this study. This research focuses on human beings and is constructed with participants as co-researchers, as opposed to research done on people by 'experts'.

We chose PAR due to our view that PAR is driven by the following three distinct elements: a shared ownership of the research project; a community-based analysis of social problems, and an orientation towards community action (Shea et al. 2013: 4; Kemmis 2006: 462; Titterton and Smart 2008: 57; Kemmis

2010: 19). The goal of the study is to confirm that everyday knowledge will always shape the lives of ordinary people (Cameron and Gibson 2005: 317). We also assume that this type of research enables the voices of the usually less valued people in research strata to be heard and respected. For instance, we were invited to be involved in the coordinating team, which was made up of ordinary members of the school community – as long as they were interested and willing, they could participate. Although the research project dealt with the leadership role in the use of ICT for teaching and learning, members of the school community were invited to participate through engagement and involvement. Another reason for us to consider PAR appropriate for this research is the fact that it values local and indigenous knowledge of marginalized groups and uses it as a basis for revolutionary action. We were convinced that PAR has the potential to improve people's lives (Tshelane 2015: 101). PAR is based on authentic commitment because it values the process of genuine collaboration, which is rooted in the cultural capital of the people (Reason 2000: 328). Our action was encouraged by the community's cultural wealth, which is based on the following expression.

> <ext> *Motsoga pele a re, 'moroto e si ga o elele, sedikwa ke ntja pedi ga se thata'. (The early riser says one person's urine does not flow. That which is surrounded by two dogs is easy to catch.)* <ends>

Therefore, PAR is a research approach that takes a stance against oppression and inequalities that are prevalent in everyday life (Mahlomaholo and Netshandama 2012: 12). The application of PAR in our project was encouraged by our national agenda, which is enshrined in the constitution of South Africa. The constitution is based on social justice as an ethical position, committed to democratic involvement and engagement, transparency, equality, openness, and hope, particularly in the leadership arena (Sanginga, Kamugisha and Martin 2010: 696). We opted to use PAR in response to the notion that people take action to eradicate an undesirable situation they experience in their communities.

Data Generation

The focus is on implementing the data generation techniques with an aim of clearing any biases in the research project (De Vos, Strydom and Fouché 2005: 417). The coordinating team engaged the identified stakeholders of the project and gathered information in a collective manner. We used a variety of data generation techniques, namely, community forums, photo voice, workshops and focus groups. We also strived to achieve a balance in gender, age and position or rank and status; this is a basic principle advocated by CER (Mahlomaholo 2009:

228). After recruiting people from the school's constituents, we embarked on a self-empowerment project, which involved a range of training events relating to data gathering, analysis and report writing. In the first meeting with the coordinating team, we engaged in discourses explaining the brief of the coordinating team. The first action that we took, due to the discourses pertaining to the brief, was a team-building exercise conducted by the pastor. During the team-building exercise characterized by a free attitude interview (FAI),we were each given a page, on which we had to write one strength and one weakness about ourselves. After the exercise, each person had to provide a detailed explanation of his or her views regarding the problem statement to the team. We circulated a copy of the research proposal and discussed the document. The clearance certificate from the University of the Free State (UFS) and the permission letter from the Free State provincial DBE were once again circulated. We confirmed amongst ourselves that the project complied with ethical standards, and was genuine, as the UFS and DBE had approved it. There was a unanimous decision to work together to enhance the leadership role of the principal in the use of ICT in the school (Tshelane 2014: 723). One member of the team, the SMDG, who was also busy with PAR studies elsewhere, explained the principles of PAR and what the technique required of us. We agreed on the principles and values that would guide our information generation and that we would remain accountable to them. We decided that focus groups, photo and video documentation would be the central instrument used. We used video recordings, photos and minutes of meetings as the main tools for generation of data (Tshelane 2013: 20). We used Lategan's argument that creative research involves new procedures and inventions, and that it takes a much less structured approach than mainstream research and cannot always be pre-planned (2005: 25). Thus, we adopted the free attitude interview (FAI) technique advocated by Ineke Meulenberg-Buskens (2011) as a means of being creative and an instrument for generation of data. The FAI technique has elements of CER, because it involves asking just one question to initiate a discourse with respondents. The discourse is followed up by a reflective summary; it is thus persuasive to respondents and encourages members to think carefully about their arguments (Tshelane 2013: 418; Mahlomaholo 2009: 228). The term 'Free Attitude Interview' can be traced back to Vrolij and Timmerman (Meulenberg-Buskens 2011: 1). Meulenberg-Buskens argues that FAI is non-directive in nature and opens the space for the respondant to intervene. It is thus possible for the researcher and respondants to assess and negotiate issues of reliability and validity emphasised in positivist and phenomenological paradigms (Meulenberg-Buskens 2011: 2). FAI enabled us to employ reflexivity as a means of controlling the effects of researcher-bias and its influence on the research process.

Discussions and Results

Conditions in the School Prior to the Intervention

The school has approximately 1,900 learners from grade 10 to grade 12, with a teaching staff of fifty-three educators, including eight heads of department – four men and four women. The principalship comprises two deputy principals, one female and one male, and a male principal. There are eight support-staff members, of whom six are women and two are men. The curriculum of the school consists of five streams from grade 10 to grade 12. In 2012, more than eighty grade 10 and 11, and forty grade 12 learners are registered for CAT, with some restrictions on using the internet. This means that a small proportion of learners are exposed to ICT. However, the introduction of 'HeyMath!' in the sciences has created a platform for maths and science teachers to incorporate ICT into their lessons. The school was able to produce a 97 per cent pass rate for the first cohort of CAT learners in 2009 and 100 per cent in 2010, but the rate dropped to 85 per cent in 2011. The enrolment of learners in Matric was forty-three, on average, for the past three years, but it dropped significantly to only thirty learners in 2012. Two subjects in which the average pass rate is below 45 per cent are geography and history. The worst performing subject, physical sciences, has a pass rate of 33 per cent.

After reflecting on these challenges, we were troubled and even owned up to the problems, which led us to intervene. Intervention in this context means a 'purposeful action by human agency to create change' (Greenwood 1993: 34-40). In response to an invitation to participate in the study and to address challenges at the school, we established as a first step a community forum at which the major problem facing the school was discussed. At that meeting the school's results were presented and discussed at length under the leadership of the School Management and Governance Developer (SMGD) (in accordance with the Employment of Educators Act [EEA] 76 of 1998, Section 3.4). The general attitude at this meeting was that the results are unacceptable. Participant statements confirm this. They took turns suggesting solutions to the challenges faced by the school. The people-centred nature of the meeting made constructive changes more sustainable, because participants, as active agents, realized that they had a role in improving their own situation and their community's quality of life, and thus had a stake in sustaining the results of their efforts (Zuber-Skerritt, Wood and Dick 2013: 2). After the presentation of a comprehensive report, the school stakeholders were invited to make inputs. The final resolution was to elect a coordinating team, which was given a brief to report to the school community forum on a quarterly basis.

Identification of a Common Need

The identification of the need to enhance the principal's leadership role in the use of ICT was crystallized when the school invited all stakeholders to a consultative forum, at which the SMGD presented the results of the whole school over a period of three years. The general feeling among the stakeholders was that the results were unsatisfactory. Although some learners joked during the presentation, the mood gradually changed, from excitement to silence and anxiety. The presenter ended the presentation with the following words:

> <ext> *Jaanong Bagaecho re ne re kopa go re lo rethuse go fetola boemo joo le rona re ke re tshwane le dikolo tse dingwe*
> *(Now, family, we were asking for your help to change this situation so that we can also perform like other schools around.)* <ends>

It was clear that performance over three years had fluctuated, but in general, academic performance had been poor. One parent asked somewhat rhetorically:

> <ext> *What can we do to help improve the performance in the school? Yes, we can see that something must be done. We are not teachers remember?* <ends>

The answer was clear – everyone was willing to help but not sure how to go about it. One parent suggested that the forum elect people who could look into the possibility of improving teaching and learning by integrating ICT. This led to the second step, presented below. A coordinating group to represent the research team was formed, comprising the chairperson, secretary and RCL representative, the pastor, principal, a community development worker (CDW) and a teacher. The team size was considered an important structural variable for determining team process and subsequently team performance and productivity (Eurera 2010: 2; Hoegl 2005: 209). The team started its activities with a team-building exercise, during which every team member had to indicate one personal weakness and one personal strength. This activity clearly indicated the diverse qualities among the members, which had the potential to ensure a successful research project but that needed to be communalized into a shared vision.

Shared Vision

Due to the diverse skills, knowledge, autonomy, cohesion, and informal communication skills possessed and exerted by individual members, each with a different purpose, the team agreed to create a common vision that would

enable the realization of functional and innovative progress and performance (Carmen, de la Luz and Salustiano 2006: 180). Consultative processes were followed among team members; arguments and debates lead to the formulation of a collective and shared vision (Kemmis and McTaggart 2005: 560; Kemmis et al. 2010: 112). The vision agreed upon is *letting learners learn using ICTs*. The team vision took learning styles and teaching styles and strategies of teachers into consideration. The purpose of the vision was to deepen learners' understanding and to encourage them to apply high-order thinking skills, and not merely recall (RSA 2004: 20). The intention of creating a team vision was to achieve the objectives of the research process. However, the team realized that there were further questions that needed to be answered in order to achieve the objectives of the project .Therefore they engaged in a PESTLE and SWOT analysis.

PESTLE and SWOT Analysis

The concept PESTLE is a mnemonic, in which P stands for political, E stands for economic, S for social, T for technological, L for legal and E for environmental (Peng and Nunes 2007: 229). It gives an overview of the whole environment, which the team had to check and report on from many angles. The PESTLE factors are deemed to be macro-environmental factors. The usefulness of the analysis lies in the assumption that, in this case, the success of the school regarding the improvement of performance cannot be understood without gathering information relevant to specific physical and social factors outside the school environment. The team decided to use PESTLE analysis as a way of developing an in-depth understanding of the context of professional curriculum practice using ICT in order to achieve the objectives of the study.

SWOT analysis is a design method that addresses the Strengths, Weaknesses, Opportunities and Threats experienced in the school. This was used to conduct strategic planning (Friesner 2011: 2). The intention of the team was to build on and solidify their PESTLE analysis and to embrace all factors that would enable it to achieve success. The coordinating team also wanted to eliminate limitations and barriers that might prevent it from achieving their objectives (Gao and Peng 2011: 796). After the coordinating team completed the SWOT analysis they proceeded to determine their priorities.

Team Priorities

Priority setting is a way of harmonizing contending claims for resources; but the nature of the exercise is unclear. By setting priorities, the team could influence or denote importance, set relative value precedency and allocate special status or lexical ordering (Spicker 2009: 117). The coordinating team set priorities

with the hope that the points collected would encourage all stakeholders to react to the various issues presented.

Strategic Plan

A strategic plan is a framework for strategic thinking, directions and actions that lead to achieving consistent and planned results. The focus was mainly on realizing the vision, mission and values set by the team for the research project. A strategic driving force, strategic objectives and programmes were also drawn up (Vaara, Sorsa and Pälli 2010: 687); financial forecasts and, finally, an executive summary, were compiled. The team was aware that implementing a strategic plan required financial resources, so priority was given to activities that needed minimal financial resources. Thus, planning was restricted to activities that could be covered by resources available in the school. Because the team realized that it would require more than three years to implement all the priorities identified, we agreed to select only major activities per objective that were within the team's capabilities. Thus, the coordination committee decided to prioritize three dimensions, namely, pedagogical, technical, network and collaborative dimensions.

Action Plan

An action plan was necessary to demonstrate the wealth of leadership skills and ability possessed in the school that may yet be untapped. The team brought their skills and shared them as a communal product for the entire school's benefit. The action plan was integrated in the strategic plan and captured the following aspects: the activity to be executed, the person responsible, the resources required, and the evidence to indicate whether the activity had been executed successfully The action plan also showed the duration of the activity.

Monitoring the Intervention Programme

In order for the intervention programme to be sustainable, the coordinating team integrated a monitoring plan. The purpose of designing a framework to enhance the leadership role of the principal in the use of ICT in school was driven by the desire to improve the quality of teaching and learning at the school, with the overall aim of achieving quality education (Mokhele and Jita 2012: 577).

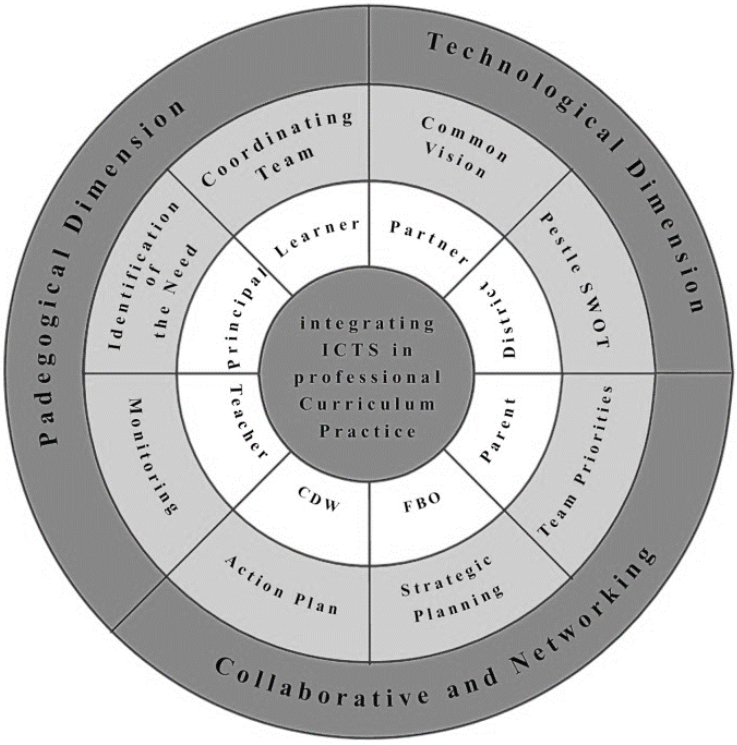
The Framework

The coordinating team designed and implemented the framework to enhance the principal's leadership role in the use of ICT, which confirms the argument that

> <ext> social reality is constructed and social science knowledge is similarly a construct of social inquiry. There is no independent social reality that exists outside of human reflection and inquiry (Babbie and Mouton 2001: 40). <ends>

The first stage of building towards the framework was operationalized through PAR. People were brought into a space to reflect on the performance of the school. After they had gained a deeper understanding of the context, the team resolved to transform the situation while simultaneously working towards self-empowerment and an emancipatory agenda framed and set by the consultative forum. Merely reflecting on the undesirable situation validates the research project; thus the coordinating team owned the problem and felt responsible and accountable for solving it through teamwork and following a thorough cyclical approach to the problem (Zuber-Skerritt 1996: 84). The proposed framework is depicted in Figure 1 below.

Figure 1: The Proposed Framework



Conclusion

This article has documented the processes and procedures of exploring the path followed by the coordinating team through the PAR paradigm, focusing on the principal's leadership role in persuading teachers to use ICTs in their professional curriculum practice within the school. It has deliberated on the basis of these three emerging themes. In order to understand the principal's leadership role in the use of ICT, the article analysed the data from the pedagogical dimension, with special focus on the principal's provision of sustainable leadership. The contributions of the principal's leadership role in influencing teachers to use ICT in professional curriculum practices were dealt with using a special focus on the technical dimension theme. The strategy or framework for technology integration in the school were also presented and discussed under the theme of collaboration and network.

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Accounting Teacher Preparation: A Critical Accounting Perspective

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Abstract

The aim of this article is to reflect on and analyse the preparation of accounting teachers from the perspective of critical accounting as the theoretical framework. There are many challenges in the Further Education and Training (FET) school accounting classrooms where teachers struggle with knowledge content, pedagogical content knowledge, and knowledge of teaching accounting, as well as classroom practices. In this article we argue that many of these challenges could be resolved if we adopt principles and ideas from critical accounting as bases for preparing aspiring teachers. Critical accounting is also the theoretical framework within which we couch the study since it encourages the optimal learning of accounting. Such improved quality, as argued here, is marked by effective teaching and learning strategies which are learner-centred, promote self-regulated learning, and are compatible with the prescripts of the democratic constitution of the country such as equity, social justice, peace, freedom and hope. The article concludes by arguing that critical accounting is not separate from accounting practice in general. Instead, it is seen as the means of reflecting or interacting with accounting information in order to challenge the hegemonic and counter-transformatory understandings that are conventionally generated to disempower and further marginalize subaltern communities. Critical accounting is used as both the lens and the mode of teacher preparation. As a mode of teaching it seems to hold the promise of teaching accounting which is more than just 'training for work' and 'skill development'. It is an approach geared towards actualizing aspirations for the individual, in terms of social and economic well-being, in ways that empower and transform. This article therefore considers the challenges of teaching and learning accounting and suggests ways in which these could be resolved through a teacher preparation approach which is grounded in critical accounting strategies.

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Résumé

Le but de cet article est d'engager la réflexion et l'analyse sur la formation des professeurs de comptabilité, en utilisant la comptabilité critique comme cadre théorique. Il existe de nombreux défis à relever dans l'enseignement des cours de comptabilité en ce qui concerne les cours supplémentaires d'enseignement général et professionnel (Further Education and Training- FET) où les enseignants ont des difficultés par rapport au contenu de la connaissance, à la pédagogie relative à la comptabilité ainsi qu'aux pratiques en classe. Dans cet article, nous soutenons que bon nombre de ces défis pourraient être relevés par l'adoption des principes et des idées de la comptabilité critique comme bases pour la formation des futurs enseignants. La comptabilité critique est aussi le cadre théorique dans lequel nous plaçons l'étude, car elle encourage l'apprentissage optimal de la comptabilité. Cette amélioration de la qualité, telle que soutenue ici, est marquée par des stratégies d'enseignement et d'apprentissage efficaces qui sont centrées sur l'apprenant. Celles-ci promeuvent l'apprentissage autorégulé et sont compatibles avec les dispositions de la constitution démocratique du pays par rapport à l'équité, la justice sociale, la paix, la liberté et l'espoir. En conclusion, l'article soutient que la comptabilité critique n'est pas distincte de la pratique comptable en général. Au contraire, elle est considérée comme un moyen de réflexion ou d'interaction avec l'information comptable pour contester les interprétations hégémoniques et contre-transformatrices qui sont classiquement générées pour déresponsabiliser et marginaliser davantage les communautés subalternes. La comptabilité critique est utilisée à la fois comme angle d'analyse et mode de formation des enseignants. En tant qu'approche pédagogique, elle semble permettre un bon enseignement de la comptabilité qui est plus qu'une simple « formation spécialisée » et plus qu'un simple « développement des compétences ». Il s'agit d'une approche orientée vers l'actualisation des aspirations de l'individu, en termes de bien-être social et économique, d'une manière qui renforce ses capacités et le transforment. Cet article examine donc les défis en matière d'enseignement et d'apprentissage de la comptabilité et suggère les voies et moyens de les révéler par une approche de formation des enseignants fondée sur des stratégies comptables critiques.

Introduction

In recent years there has been growing interest in the area of teacher knowledge (Abell 2008: 1405; Gorski 2008: 310; Levitt 2008: 48 & Shulman 1987). However a great deal of research is aimed at developing a knowledge base of teaching and where possible, it is translated into recommendations for teacher education (Van Driel, Meijer & Verloop 2001). According to Shulman (1987:04) the knowledge base of teaching is a codified or codifiable aggrega-

tion of knowledge, skill, understanding, technology, ethics and disposition, and collective responsibility – as well as a means for representing and communicating it. Therefore the knowledge base includes content knowledge, pedagogical knowledge and contextual knowledge. The three are described as fundamentals to pedagogical content knowledge (Nilsson 2008: 1282). The line of reasoning for many scholars is to suggest answers to the questions of the intellectual, practical and normative basis for the professionalisation of teaching; however, more results have led to the generalisation of problems (Van Driel, Meijer & Verloop 2001: 443). This article highlights that, in many instances, teacher knowledge is referred to without direct attention to the specific content area. Sadly, not much research emphasise contextual factors such as the social, political and economic that will assist in avoiding general claims about teacher knowledge, teacher education, or policy.

Africa, as a continent, has its unique challenges as compared to other continents. To be specific, South Africa has a political background that has led to the development of many educational reforms. One cannot ignore its unique challenges even after twenty years of democracy. From this premise, preparing accounting teachers should also nurture critical consciousness and prepare them to understand the socio-political nature of their work (Gorski 2009: 316). Critical accounting as a theoretical framework used in this article connects the socio-political context of education with the issues of power and powerlessness that are central to the development of teacher knowledge. This connection emphasises the need for accounting teachers to engage in the laboratory process of social change (Gorski 2009: 317).

This article begins by considering the challenges faced by accounting teachers in Further Education and Training (FET) Schools, in particular the accounting classroom where there is a struggle with content knowledge, pedagogical content knowledge, accounting knowledge for teaching and accounting classroom practice. Principles of Critical Accounting are used in the analysis of these challenges as an attempt to resolve the challenges. The study also takes account of accounting teacher education responses currently in South Africa and Internationally.

Accounting Content Knowledge and its Challenges

Shulman (1987:08) argued that content knowledge (subject matter knowledge) includes knowledge of the subject and its organizing structures. Content Knowledge (CK) is the "knowledge about actual subject matter that is to be learned or taught" (Bara et al. 2009: 125). Teachers must know about the content they are going to teach and how the nature of knowledge is different for various content areas.

At an institution of higher learning all students who are interested in pursuing their careers in accounting, irrespective of their career path, are taught accounting content as their major. This includes:

- Management Accounting and Control
- Financial Accounting and Reporting
- Taxation
- Auditing and Assurance
- Business and Commercial Law
- Professional Values and Ethic-related Knowledge, Organisational and Business Knowledge.

These provide the core technical foundation essential to a successful career in accounting. The accounting curriculum is itself changing and will continue to change in response to rapidly changing market demand. New topics are entering the curriculum and the relative emphasis among topics is altering. Member bodies may wish to add topics, or alter the balance of their programmes to meet the needs of their particular environment.

Accounting is a subject that is closely allied to the book, where students are supposed to know international accounting standards, as it is said to represent globalisation in the accounting arena. They are taught with the goal of developing the ability to interpret rules and principles and the capacity for analysis and judgement.

The challenges are that the content is very broad since it requires more attention in the application and interpretation of policies and ethics governing accounting. At the early stage students learn to study and understand as much as possible sometimes without dialogue, since they need to be labelled as persons who have passed and claim to know accounting. Accounting content uses examination, understanding of concepts and processes, as conveyed to students, to label those who cannot understand or pass as "unintelligent'" It overlooks the fact that it may be because these students find it difficult to make sense of those concepts, processes and practices relevant to their social background. Thus through these "objective" examinations, individuals come to see themselves as healthy or unhealthy, intelligent or unintelligent, normal or abnormal and discipline themselves accordingly (McPhail 2001: 481). Unlike the majority of academic disciplines, a significant portion of the knowledge conveyed to accounting students is determined by a body of professional institutions (Hope and Gray in McPhail 2001: 475). The view is manifested in a teaching and learning approach that centres on passive teaching education and focuses on the transfer of a discrete body of procedural knowledge, including an ever-growing technical content. Accounting content may be seen

to support accounting education that serves the interest of capitalists because the economic base determines the kind of knowledge conveyed to accounting students and the kinds of uncritical attitudes engendered during the process (Boyce 2004: 569; McPhail 2001: 475).

Critical Accounting as an Approach to Some of the Challenges

Broadbent (2002: 433) argues that accounting is an activity which involves identifying, collecting, describing, recording, processing, and communicating information in financial terms about the economic events of an entity, to groups and individuals who have a need or right to the information. Therefore accounting is a system of thought designed by humans to assist human decision-making and influence (human) behaviour.

Critical accounting is not separate from accounting practice in general. Instead, it is seen as the means of reflecting or interacting with accounting information in order to challenge the hegemonic and counter-transformatory understandings that are conventionally generated to disempower and further marginalise subaltern communities. Critical Accounting Research (CAR) focuses on measuring performance, processing and communicating financial information about economic sectors informed by the same founding principles of a democratic constitution such as equity, social justice, peace, freedom and hope (Boyce 2004: 577; Haslam and Gallhofer 1997: 74). Critical Accounting Theory (CAT) aims to unmask the often hidden interests of those who would seek an unjust allocation of a society's scarce resources, which it unmasks so that all interests in society can benefit (Laughlin 1999; Broadbent 2002). Its purpose is to ensure the use of accounting does not represent certain interests at the expense of others, especially the marginalised.

There are at least four important characteristics of critical accounting. Firstly, it is always contextual and recognises that accounting has social, political and economic consequences. Secondly, it seeks engagement which means that it is always undertaken to change (improve) the practice of accounting for the benefit of the people. Thirdly, it is concerned with both micro- (organisations) and macro- (societal and professional) levels. Lastly, it is interdisciplinary in that it engages with and borrows from other disciplines like economics because it deals with economic phenomena, although it deals with them from a different perspective that involves control systems, information processing and behavioural consideration.

From the foregoing background, CAR recognises that accounting is a social science and not a mere collection of abstract mathematical manipulations or calculative routine. It is concerned with how technical matters (accounting principles and reports) affect people and relations between them. The inputs

to accounting are human actions, and the output of accounting information is likewise a human action. At every turn, in the contextual nature of accounting, one recognises human nature. Critical accounting can be argued to be contextualisation within society, organisations, and history and the recognition that it is a human endeavour (Armitage 2015; Laughlin 1999: 73). Critical accounting is always contextual, whether at school or as a profession, it is a phenomena which has social, economic and political consequences and needs to be understood (and changed) in this context (Laughlin 1999: 73).

Content knowledge encompasses an understanding of the various ways a discipline can be organised or understood, as well as the knowledge of the ways by which a discipline evaluates and accepts new knowledge (Ben-Peretz 2010:04). Content knowledge is not conceived to be enough for teachers. The transition of an accounting expert student to a novice student, where a successful accounting student transforms his or/her expertise in the subject matter into a form that a high school learner can comprehend requires a body of knowledge known as "Pedagogical Content Knowledge" (PCK) (Shulman 1986: 8).

Challenges of Accounting Pedagogical Content Knowledge

As we were evaluating accounting student teachers during teaching practice, which takes place quarterly, I could not help but notice the pattern used in their teaching. Their main goal was mostly to finish the lesson they had prepared for the day, not necessarily the process of teaching per se. Learning to teach may be a complex process if we are going to move from the notion of regarding teaching as mere delivery of information to develop a complex and contextualized set of knowledge to apply to specific problems of practice (Abell 2008: 1414; Nilsson 2008: 1281). The Foundation of PCK is thought to be the amalgam of a teacher's pedagogy and understanding of content such that it influences his or/her teaching in ways that will best engender students' learning for understanding (Shulman 1987: 7).

Shulman (1986:08) conceptualized PCK as including the most powerful analogies, illustrations, examples, explanations and demonstrations – in other words, ways of representing and formulating the subject that makes it comprehensible for others. He further attested that it is the category most likely to distinguish the understanding of the content specialist from that of the pedagogue.

Learning to teach accounting is not about acquiring a bag of tricks based on a set of general pedagogical strategies. It is about developing a complex and contextualised set of knowledge to apply to specific problems of practice (Abell 2008: 1414).

The nature of accounting content poses challenges as highlighted under content knowledge, since the larger part of it, is mostly the policy, that is by the book where content is more than the application of rules and procedures. In this context learning allows little or no space for dialogue or reflection since things are mostly imposed on students, and they in return normally take them unquestioningly by memorising as much as possible. This leads to further problems when teachers are supposed to comprehend and transfer content to the learners. While the South African policy document of CAP, emphasises that teachers should encourage an active and critical approach to learning, rather than rote and uncritical learning of given truths; current classroom practices regarding the teaching of accounting, especially at FET Schools, reflect the direct opposite (Broadbent 2002: 433).

Memorisation is still common practice in these classrooms. Focus is still on teaching for success in national and provincial examinations, frequently without any clear understanding of the concepts and processes informing and couching accounting as a subject (Boyce 2004: 569d McPhail 2001: 475). As in Brazil, the teaching of accounting focuses on the success of a national examination more than on the learning process. In accounting classrooms more teacher-centred approaches to the learning of accounting are widespread, leaving little room for more learner-centred approaches (Armitage 2014; Laughlin, 1999). There tends to be dependency on the textbook method which is most often a single view or a general statement, giving only general guidelines in violation of a teacher's other roles such as research, leading and pastoral care. Content in the classroom is mainly abstract and learners struggle to relate to it in a way that is meaningful to their own lives. Accounting therefore contradicts with the critical cross-fields emphasising the cultivation of citizenship (DBE 2011: 6). ANA results reveal that below average learners progress to Grade 10 accounting. This is in contrast with the level descriptor of applied competence in the Outcomes–based framework (DBE 2011: 4). Zimbabwe introduced a policy of automatic promotion for primary education which strongly discourages the repetition of grades. This means an accounting learner who is not cognitively ready to move to the next level will be promoted to that level.

Critical Accounting as Pedagogical Content Knowledge

Since there is little that a teacher can do to change the content, the teacher has power, as supported by the policies, to change how accounting is taught. Critical accounting encourages educators to explicitly strive to transcend accounting in attempting to contribute to the development of accounting that would be more enabling and emancipatory. A more critical form of accounting education would conceptualise knowledge as an active tool that students can

use to "generate their own meanings" and make sense of their life-worlds, rather than as a set of meanings or perhaps even just words that are deposited in the student (Boyce 2004: 571; McPhail 2001: 490).

Critical accounting allows teachers and academic accountants to realise that they have a particular responsibility that flows from the central role of their discipline in creating and sustaining social reality, including the present dominance of economic rationalism (Boyce 2004: 570). Critical accounting thought extends well beyond the life of individuals' social life and the lives of others, including their ideas, hopes and suffering which are equally important considerations, because following Gramsci, every person is "a citizen of a wider world" (see also Boyce, 2004: 581).

CAR insists on ensuring that learners acquire and apply accounting knowledge and skills in ways that improve their own and others' economic well-being, and are simultaneously meaningful (DBE 2011: 1). Furthermore CAR is compliant with all the critical cross-field outcomes which emphasise the cultivation of a democratic citizen who can work and live with others meaningfully towards the economic development of the country. Linked to the above are the level descriptors which CAR operationalises as it cascades the critical-cross field outcomes in the curriculum and the classroom of accounting at a suitable cognitive level of a learner. Derived from the critical cross field outcomes are the learning outcomes for accounting which inform the lesson outcomes by using a suitable facilitative strategy that encourages active participation by learners, DBE 2015). CAR requires a teacher who is a mediator between the intricacies of the curriculum and a learner, who interprets real life adequately for the former, The teacher is a leader in terms of the knowledge and skills required, and a researcher providing pastoral care, and assessing effectively to enhance learning. S/he is a subject specialist. Critical accounting abides by all the steps from the intended curriculum to the classroom practice, and eventually the assessment, which is in line with the constitution that seeks to promote knowledge in local contexts, while being sensitive to global imperatives.

The accounting teacher, through the use of CAR, may explore the possibilities of connecting accounting to the ordinary feelings and experiences which learners have in their lives outside the classroom thereby experiencing the lived reality and bringing the historical and contemporary social underpinnings of accounting practice into the classroom (Boyce 2004: 575). CAR would involve trying to engender a critical reading of learners' existential situations which would allow them to develop their own frame of reference while simultaneously being aware of its contingency (McPhail 2001: 488). It involves encouraging them to play a more active part in their becoming; through the

use of more learner-centred methods that encourage problem-based learning and critical thinking (McPhail 2001: 489). Methods that are more learner-centred emphasise student dialogue, negotiation, and knowledge building as well as student autonomy and responsibility for learning. This view is also supported by the CAPS as a current policy, in which it is further highlighted that high knowledge and high skills are based on the belief that reality must be discovered by each individual him or/herself (DBE 2015). CAR answers the question confronting accounting teachers – whether to view a learner as a receiver or constructor of knowledge.

Critical accounting should provide an opportunity for learners to develop their ability to think critically about the system in which they would one day work and question the way in which they are supposed to contribute to an ethical and just society. A significant amount of critical accounting theory asks questions regarding powerful discourses in organisational settings and how those who communicate their lived experiences in oppressive cultures and environments can change their situation by means of emancipatory practices and political action whereby they are not just recognised as mere units of production or faceless and voiceless objects behind the facts and figures on a balance sheet (McPhail 2001: 488). This has multiple effects in the teaching approach. Once learning focuses on the process rather than the product, which is only the passing of an examination, learners are encouraged to understand rather than memorise. The use of other teaching resources besides a textbook would be possible since the pressure to grasp only for exams may be minimised. CAR is in agreement with the critical gross fields' outcomes and the level descriptors. Non-compliance with education policies and documents can divert the focus from what the constitution strives to achieve in accounting. However, pedagogical content knowledge alone cannot further our understanding of the relationship between teacher knowledge and, teaching and student learning. Hence there is a need to look at the teachers' work through accounting knowledge for teaching (Ball, Phelps and Thames 2003).

Accounting Knowledge for Teaching

The main challenge seems as if more focus is on the curriculum or standards for student learning, giving little attention to the study of teachers' work. Teaching occurs in direct face to face interactions with students. But teaching also involves analysing student work, making content-based activities for instruction, choosing appropriate questions to ask in the classroom and explaining student progress to colleagues or parents in many other content intensive practices that support the interactive work of teaching (Ball, Phelps and Thames 2001). Therefore accounting knowledge for teaching goes beyond content and pedagogical content

knowledge since it is highly connected to teaching practice and therefore very specific to the subject area and grade range. It means accounting knowledge that is needed to carry out the work of teaching accounting. Knowledge for teaching is concerned with the task involved in the teaching and accounting demands for these tasks, because teaching involves showing students how to solve problems, answering students' questions and checking work, and demands an understanding of the content of the school curriculum.

Subsequently this article illustrates that accounting knowledge for teaching may be divided as common content knowledge and specialised content knowledge as a refinement to the accounting content knowledge (Ball, Phelps and Thames 2005).

Common content knowledge in accounting is expected from a well-educated teacher, since it is closely related to the content of the curriculum, particularly accounting and finance. It includes knowing when students have incorrect answers, recognising when textbooks give an accurate definition, or calculation, and being able to use terms and notation correctly when speaking and writing on the board as illustrated below:

Common Content Knowledge (CCK)

- Knowledge teachers need in order to do work given to students.
- Related to the content of curriculum.

Statement of comprehensive income for the year ended

Decimal

	R	c
Sales	98 765	85
Less Cost of sales (CoS)	(23 621	65)
Gross profit (GP)	75 144	20

$$GP\% = \frac{GP}{CoS} \times 100$$

Knowledge of Content and Students (KCS)

- Combines knowing about students and knowing about accounting.

	R	c
Sales	98 765	85
Less Cost of sales	23 621	65
Gross profit	122 387	50

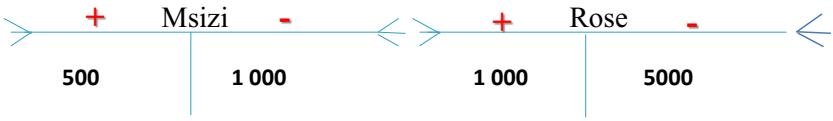
Specialized Content Knowledge

Interpreting student error and evaluating alternative formulas are not all that teachers do. Teaching also involves knowing rationale for procedures, meanings for terms and explanations for concepts, not only to confirm the answers but to show what the procedures mean and why they make sense. This kind of knowledge is regarded as specialized content knowledge (Ball, Phelps and Thames 2008). Accounting demands of teaching require specialized knowledge that is needed by teachers but not needed by other careers. Accountants have to calculate and reconcile numbers where no explanation is required. The question is the daily fare of a teacher's life in teaching. The demand of the work of teaching accounting creates the need for a body of accounting knowledge that is specialized for teaching as illustrated below:

3. KNOWLEDGE OF CONTENT AND TEACHING (KCT)

- **Combines knowing about teaching and knowing about accounting**

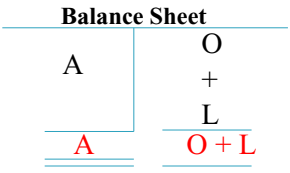
Double entry principle



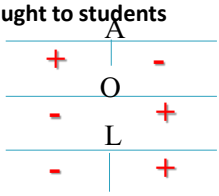
If 1st account debited, then 2nd account credited
If 1st account credited, then 2nd account debited

4. SPECIALISED CONTENT KNOWLEDGE (SCK)

- **Teachers need to know body of accounting not typically taught to students**



A = O + L
Accounting equation
Balance sheet equation
LHS = RHS



Mkhize (2013)

A teacher may have this kind of knowledge. But the key is the transition from the teacher to the students which poses more challenges to accounting classroom practice. How does a person or someone that really knows something teach it to somebody who does not? This question may be answered by the classroom practice of the accounting teacher.

Accounting Classroom Practice

Classroom practice provides a space for the learning process to unfold and links what teachers know and how their knowing is expressed in teaching

(Clandinin, Connelly and He 1997: 672). The integration of content and pedagogical process is a theoretical prescription for success. Yet, it is practically challenging. Many educators focus on one or the other rather than the joint process (Nagda, Gurin and Lopez 2003: 168). Content without transformative pedagogy may be rhetorical, intellectualizing, and divorced from reality, while an active and engaging pedagogy without a critical knowledge base may result in temporary 'feel good' emotions (Nagda, Gurin and Lopez 2003: 168). This critical knowledge base requires the teachers to emphasize and understand ways of teaching and knowing as the bedrock for integration, application, and discovery; not to develop knowledge for knowledge's sake, but to use knowledge effectively in a rapidly changing society (*ibid.*: 185). Critical accounting requires accounting classroom practice not only to combine teaching and student involvement strategies creatively, but to be explicitly designed to prepare students for an active, democratic, and just citizenry. Education must encourage students to become active transformers of the world around them (*ibid.*: 168).

In the accounting classroom the main problem is lack of dialogue, since too many teachers are teaching to the test (Levitt 2008: 53). Many teachers do this in response to the competitive environment and meeting demands made by government policies, and consequently have reduced teaching to a technical and micro-managed activity. The lack of dialogue is couched within the backdrop of university education that is driven by certification and the target-driven culture of its degree programmes and professional bodies that value success by the number of exam pass rates (Armitage 2011: 108). The lack of dialogue manifests itself in the practice of the teacher in the FET class where many FET principals live in anxiety or fear of being labelled dysfunctional by their district or provincial government, and eventually by national government. They transfer their anxiety to teachers, and ultimately, to students and their parents. In the hope that students will reach 100 per cent pass rates, too many teachers are teaching to the test following a daily repetitive testing of scripts and frequently textbooks (Levitt 2008: 53).

Critical Accounting Research (CAR) argues that accounting teachers have a particular responsibility that flows from the central role of their discipline in creating and sustaining social reality (Boyce 2004: 570). For teachers to be critical is to create freedom in the form of dialogue, since accounting classroom practice can only emerge from a situation of open, free and uninterrupted dialogue that takes the form of self-conscious criticism (Armitage 2011).

Freire refers to dialogue as a conversation with a focus and a purpose that shows that the object of study is not the exclusive property of the teacher, and that knowledge is not produced somewhere in the textbook and in offices and

then transferred to the students. Dialogue provides students with knowledge of the social functioning of critical accounting which affords students the opportunity to challenge the taken-for-granted neutrality of accounting, to imagine alternative forms of accounting and see the potential role of critical accounting in social and economic worlds. CAR also recognizes the power relation between the teacher and a student as the power relation between those who teach and those who are taught (Armitage 2011: 112). These are central to the learning process for truly democratic, empowering and emancipatory practices both for the student and teacher alike (Armitage 2011: 113).

Foucault (in Levitt 2008: 54) spoke of power, when he referred to relations of power in which one person attempts to control the conduct of the other. He further attested that power relations exist at various levels, in various forms, and can be changed. Thus, there needs to be a certain amount of freedom on both sides in this dialogue. Through discussion and debate that highlights students' viewpoints, there is shared power and dialogue among the teachers and students. Teachers can allow an element of freedom by using their authority to create a relationship which, in turn, enhances an educational relationship that challenges schooling notions of oppressive race, class, and gender stereotypes. Critical accounting involves both students and teachers actively interacting with what is taught in 'condition of mutual respect' through the open exchange of ideas and proliferation of dialogue (Armitage 2011). The dialogue becomes the means for the creation of democratic, emancipatory and transformative practices within the sphere of pedagogy and communication between teachers and students. As they are allowed to interact in class, accounting students would conceptualize knowledge as an active tool that they can use to generate their own meaning and make sense of their life-worlds, empowering themselves in the process (Neu, Cooper and Everett 2001: 735).

The dialogue process involves sharing experiences and perspectives, listening to others' viewpoints, working through disagreements and conflicts, and talking about ways to address injustices (Nagda, Gurin and Lopez 2003: 186).

Freedom in a FET classroom may achieve four outcomes. Firstly it invites students to dialogue in an open, safe environment with each other, an important aspect in a classroom. Secondly, it shows students there is no right answer, but rather a need to justify themselves in the gaze of their peers. This also provides an opportunity for students to become reflective and critical thinkers and shows that ownership of opinions and knowledge is not solely the 'gift of the teacher' or the textbook. Thirdly, it creates authentic learning environments through inductive engagements with the world and the understanding of democratic principles such as peace, hope, social justice and equality. It also sends a message to students that critical accounting is a human endeavour that

goes beyond the rules, regulations and legislative contents of an organization and a profession. The foregoing suggest that critical reflection and exposure through dialogue to the multiple contents in which subject matter is situated may foster critical thinking, curiosity, and motivation to learn and result in deeper learning (Armitage 2011: 114; Berry, Loughran and Van Driel 2008: 1274; Nagda, Gurin and Lopez 2003: 170).

Conclusion

In the eyes of many students, accounting is self-directed learning to the enhancement of an individual student, where the focus is to develop their capability for clear thinking and creative capacities. Change in accounting can be directed towards regaining and rebuilding social relevance for a discipline too often associated with a narrow economic imperative rather than the broader public interest (McPhail 2001: 476). The most critical observation possible for many in accounting education is that students study accounting because of the perceived job prospects it provides, not essentially because they find it interesting (McPhail 2001: 479; Boyce 2004: 568). Conventional accounting education is increasingly centred on the narrow goals of preparing students for work and meeting the needs of business for trained workers since traditionally accounting has been narrowly defined within disciplinary boundaries that exclude consideration of anything outside the policies and practices of the discipline as such.

Teachers under the auspices of education are responsible for working through the givens to produce a consciousness in students that accepts and hence maintains the economic inequalities on which capitalism is based (McPhail 2001: 475). Teachers themselves are not conscious of this, because their conventional accounting trained them to understand their discipline and practices that are more often than not solely of interest to them but have nothing to do with a didactic situation. It is through our teachers that critical accounting can possibly be conveyed to our learners because the change is rooted in the nature of knowledge that is created through an organic process powerful enough to build or empower our students. Teachers are to encourage students to critically consider and even challenge their learning, and teachers must develop their own self-image as knowledgeable individuals, interacting and learning with others by joining forces or 'regrouping', and forming a 'network of power relations' (McPhail 2001: 475). The people can make a 'revolution' possible. Interaction and dialogue in critical accounting acknowledges that transformation is central to emancipatory practices and to individual awareness with which the students exist in the world but are also knowing subjects who have an engagement in social, historical, political and cultural issues

which nullify powerful discourses (Armitage 2011). The dialogue in critical accounting is motivated by a love for, commitment to and faith in people. The participants in dialogue would be characterized by humility and commitment to the common task of learning. If students are empowered to engage actively in shaping and sharing their learning by connecting it to their lives, they can and may choose to learn.

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Creating Effective Postgraduate Learning Environments: An Analysis of an Intervention from Realist Social Theory

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Abstract

This paper analyses two illustrative reports of the external examiners on some of the manuscripts of the twenty postgraduate students who graduated at the University of the Free State between 2013 and 2014. The students were part of the twenty-eight PhD and twenty-two MEd students as well as fifteen supervisors working in a cohort approach within the Sustainable Postgraduate Learning Environments research project. The two reports are analysed in order to document, understand and illustrate how the Sustainable Postgraduate Learning Environments facilitate good academic performance. The focus is mainly on the working together of the actors' emotional and cognitive aspects. The argument is that the two reports refer to two different sides of the same process, implying that improvements in the students' academic performance are influenced by the extent to which they are validated through a caring learning environment. However, it should be noted that even poor academic performance seems to be a reflection of the problems in this interaction. Both students and supervisors are affected in the same way. The paper uses Margaret Archer's theory of social realism to generate an understanding of how the interaction between the students and the supervisors on the one hand, and between cognition and emotion on the other hand, produce particular academic performances that are central in the creation of sustainable postgraduate learning environments. The argument put forth is that agency and structure can and should not be collapsed into each other, even though the two co-constitute each other. Tolerance of their separation enables individual agents to take charge

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of their own lives despite the constraints of their situations to construct particular meanings; hence, their good academic performance beyond the dictates of their contexts.

Résumé

Comme indiqué dans la littérature des sciences de l'éducation, le développement professionnel des enseignants est la pierre angulaire de l'offre d'un enseignement/apprentissage de qualité dans le système éducatif de chaque pays, avec notamment des programmes adaptés aux propositions visant à améliorer la qualité de l'enseignement et à réformer l'éducation. Selon certaines études, les compétences des enseignants en Afrique du Sud ne se sont pas améliorées comme escompté, étant donné que de nombreux programmes de développement professionnel ne sont pas encore mis en œuvre ou ne tiennent pas compte des points de vue des enseignants. En vue de relever ce défi, le présent article se fixe comme objectif de déterminer les composantes d'une stratégie qui pourrait être utilisée pour mettre en œuvre des programmes de développement professionnel, en s'appuyant sur un projet mené dans deux écoles secondaires rurales de la province de Free State. Les données ont été générées par les participants de la communauté scolaire et des fonctionnaires basés dans les districts, en utilisant une approche participative.de recherche-action. Les résultats ont révélé six éléments distincts d'une stratégie, à savoir la mise en place d'une équipe comprenant toutes les parties prenantes; la création d'une vision commune pour tous basée sur une analyse approfondie des forces, faiblesses, opportunités et menaces (SWOT); la priorisation des items; l'élaboration d'un plan stratégique; les procédures de suivi pour déterminer les progrès réalisés; et la suggestion des moyens d'améliorer les faiblesses.

Introduction

This article uses Margaret Archer's (1995; 1996) realist social theory, which is grounded in Roy Bhaskar's (Buch-Hansen 2005; Corson 1991; Mutch 2005) critical realist philosophy, to describe and generate an understanding of how a team of fifteen academics at the University of the Free State approaches the supervision of a cohort of twenty-eight PhD and twenty-two MEd students (Mahlomaholo 2012a; 2012b; 2013). This paper reflects on the reasons, factors, ideas, processes and activities that enabled some of those students to complete their studies. In order to systematize this discussion, the article firstly presents its theoretical exposition to provide a basis for understanding the approach

adopted in the Sustainable Postgraduate Learning Environments research project. Next, a detailed description of the sustainable project design, aim, focus and processes of implementation is provided, followed by the discussion and conclusion.

The Theoretical Exposition

To initiate this analysis, the paper notes that Archer's approach operationalizes Bhaskar's philosophy of critical realism (Popora 2013; Pratschke 2003; Wheelahan 2007). In fact, many approaches to date including Anthony Giddens' structuration theory (Maton and Muller 2006; Mutch 2005; Quinn 2007; Zeuner 1999), describing and generating theoretical understandings of postgraduate learning, have been reductionist, collapsing separate entities into one another and focusing almost exclusively on one or other aspect of the students' mental faculties, like their perceptions or cognitive abilities.

Realist Social Theory as the Lens

Archer's (1995; 1996) approach enables a discussion of postgraduate learning in terms of the total student; that is, his/her identity, personhood or agency, or better still, all his/her being at the same time (Buch-Hansen 2005; Corson 1991; Mutch 2005; Popora 2013; Pratschke 2003; Wheelahan 2007). Archer enables this paper to do so through the notion of the body and the mind's analytical dualism (Akram 2013; Archer 1995; 1996; Kahn 2009), which is also understood in relation to other analytical dualisms of the individual and society (Buch-Hansen 2005; Corson 1991; Mutch 2005; Popora 2013; Pratschke 2003; Quinn 2007; Wheelahan 2007) as well as that of agency versus structure and culture, and of the knower versus knowledge (Buch-Hansen 2005; Corson 1991; Mutch 2005; Popra 2013; Pratschke 2003; Quinn 2007; Wheelahan 2007). In all these instances, Archer argues that these dualities, although related, are independent from one another, as they do not rely on one another for their respective existences. They are pre-given, even before they come into any interaction with one another. The interaction that occurs between the respective dualities is a process that will either maintain or elaborate (enable) them further. Their interaction with one another in their respective dyads of dualities is important for their emergence from their natural state of being through their practical operation and ultimately functioning in the social order of reality (Buch-Hansen 2005; Corson 1991; Mutch 2005; Popora 2013; Pratschke 2003; Quinn 2007; Wheelahan 2007). This process of emergence is what Archer calls *morphogenesis* (Akram 2013; Archer 1995; 1996; Kahn 2009), indicating, assuming and giving shape to a pre-existing entity. This is the opposite of *morphostasis* (Akram 2013; Archer 1995; 1996; Kahn 2009;

Buch-Hansen 2005; Corson 1991; Mutch 2005; Popora 2013; Pratschke 2003), which implies protection and maintenance of the status quo.

Archer strongly argues that these dualisms should never be collapsed onto, nor subsumed under, one another as Giddens does, since their separation refers to a very distinct ontology that acknowledges the existence of an independent reality. The properties of the dualisms do not depend on our knowledge of them for them to exist, as the poststructuralists would allege (Akram 2013; Archer 1995; 1996; Kahn 2009). For example, the human body does not depend on the human mind for its being, and vice versa. They are both pre-given, although they need each other for their respective maintenance, elaboration and development (Kahn 2009; Buch-Hansen 2005; Corson 1991). For this article, informed by Archer's approach, emergence, which denotes reflection and reflexivity, is one of the most crucial aspects of learning through which one is able to describe the transcendence of postgraduate students from their initial to their highest forms of being, namely from being naturally given persons through being purposeful agents and ultimately becoming social actors in higher education and beyond (Akram 2013; Archer 1995; 1996; Kahn 2009; Buch-Hansen 2005; Corson 1991; Mutch 2005; Popora 2013; Pratschke 2003).

South African Qualification Authority's Level Descriptors as Bases for Describing Morphogenesis

The notion of emergence has enabled an understanding of the level descriptors in the National Qualifications Framework (NQF) formulated by the South African Qualifications Authority, which describe competencies to be cultivated through learning at all levels of formal education in South Africa. For example, at NQF level 9, where the MEd qualification is pitched, the students, among other things, have to

- demonstrate specialist knowledge to enable engagement with and critique of current research practices, as well as advanced scholarship in a particular field
- demonstrate the ability to evaluate current practices of knowledge production and choose an appropriate process of enquiry for the area of study or practice
- demonstrate a command of and the ability to design, select and apply creative methods, techniques and processes to complex, practical and theoretical problems
- demonstrate the ability to use a wide range of specialist skills in identifying, conceptualizing, designing and implementing a method of enquiry to address complex and challenging problems within a field, discipline or practice

- demonstrate the ability to make autonomous ethical decisions which affect knowledge production, or complex organizational or professional issues (South African Qualifications Authority (SAQA) 2012: 11–12).

Five out of the ten level descriptors have been selected arbitrarily to use as an illustration of the argument that for students to operate at this level of sophistication, they need to learn by means of all their faculties (and not just one or two) as total reflective and reflexive persons changing into purposeful agents. This will ultimately enable them to become committed and focused social actors through potentially transformative actions on the structures and the cultures that predate and position them (Akram 2013; Archer 1995; 1996; Kahn 2009; Buch-Hansen 2005; Corson 1991; Wilson 2010). Based on Archer's theorization, this paper argues that this *morphogenetic cycle* where persons interact with the pre-existing, but separate structures and cultures is the vehicle for their own, the structures' and the culture's transformation and transcendence to higher and more sophisticated levels of being (Archer 1995; 1996; Wilson 2010). This interaction, for example by the first 'generation' of agents, recreates the social structure, which will coach the next generation of agents who will inhabit it as pre-given, but will have the choice to change it (morphogenesis) or maintain it (morphostasis) (Kahn 2009; Buch-Hansen 2005; Corson 1991; Mutch 2005; Popora 2013). However, changing the structures and the cultures, as is the case with changing human agents, is not an easy process. It requires sustained, multi-pronged, multi-layered and multi-perspectival, collaborative and focused actions, because structures and cultures have focalized into enduring positionings, dispositions and relationships (Buch-Hansen 2005; Mutch 2005; Popora 2013). Most of the time they constitute the taken-for-granted 'truths' and ideologies that are not always interrogated, contested or challenged.

Postgraduate Learning: From Natural Order Towards Social Order of Reality

Research in South Africa shows that far fewer than 40 per cent of students who enrol for their Master's degrees, let alone PhDs, manage to graduate (see detailed references in Mahlomaholo 2012a; 2013). The assumption here is that this is due to the quality of postgraduate learning and the supervision thereof, which focus mainly on one or two of the modalities of being a student, namely cognition and, to a lesser extent, emotion/affect. To illustrate the point, Dooyeweerd (Basen 2002) identifies at least fifteen modalities of being human, namely the physical, kinematic, physiological, biotic, psychological, emotional, cultural, historical, social, aesthetic, economic, juridical, analyti-

cal, ethical and pistical. The first four of these make up what Archer refers to as a person's natural order of reality (Basen 2002; Kahn 2009; Buch-Hansen 2005; Corson 1991; Mutch 2005)**.** They constitute what concerns all human beings; hence, all the students. Students, through their corporeal bodies, for example, occupy space, and they can be counted (physical modality) so that they are not crammed or uncomfortable in their given settings. Some of these settings locating the students are urban, while others are rural, each with their respective challenges. The physical mode of being, which is naturalistic, is pre-given and forms the basis for higher forms of existence, like becoming a social actor and an activist. Through their bodies, the students are capable of movement (kinematics). They have blood circulation and their temperatures are at particular levels (physiological), while their bodies grow in size due to nutrients eaten (biotic). These four modalities also constitute the bodily dimension of an agent (Basen 2002), whereas the rest refer to the mind. Within the category of the mind-modalities are those that depend on action and practice for them to actualize, like the psychological and emotional. These are Archer's practical order of reality (Archer 1995; 1996; Kahn 2009; Buch-Hansen 2005; Corson 1991; Mutch 2005). The remaining modalities, namely the cultural, historical, social, aesthetic, economic, juridical, analytical, ethical and pistical, constitute the *social order of reality* (Basen 2002; Kahn 2009; Buch-Hansen 2005; Corson 1991; Mutch 2005). They are the ones defining human beings as different from other objects/beings/aspects of reality, as they are about functioning in social interactions. They are totally depended on us being able to stand outside ourselves to reflect and regulate our actions as humans. These three orders of reality are what an effective postgraduate learning involves and must capitalize on.

The point being made, couched in Archer's realist social theory, is that for postgraduate learning to be meaningful and effective, it would seem that recognizing the value of, and building on, all these modalities together should be the starting point of supervision. The reason for this assumption is that the modalities are not a gift of society or of the social structure, although they need them to flourish. People are born with them. However, they come to their fullness in the *relationship* between a human being (the agent) and the social structure. Problems can take place in any of them, which may hinder the student to complete his/her studies successfully, because in themselves they are enablers or hindrances. In the same way, problems in the social structure may hinder the student's academic success. However, Archer cautions that to some extent these occur with the student's complicity because she/he always interprets the nature of the relationship with the social structure (Basen 2002; Kahn 2009; Buch-Hansen 2005; Corson 1991; Mutch 2005). He/she is not

a passive recipient of everything that comes his or her way. In fact, this acknowledges the Marxist maxim that humans create reality, although not under conditions of their own making (Popora 2013; Quinn 2007; Wheelahan 2007).

The Sustainable Postgraduate Learning Environments Project

Informed by Archer's realist social theory as an approach to supervising postgraduate students' learning and as a way of generating research data and making sense of them, fifteen academics came together in 2011 sharing the same concern of improving MEd and PhD students' success rates (Mahlomaholo 2012a; 2012b; 2013). All academics had PhD qualifications in education, but their specializations were varied, ranging, for example, from mathematics, physical and natural sciences, economic and management sciences, psychology and sociology to history and languages, to name but a few. A kind of academic network was constituted where different fields of expertise were brought together. Various academic and professional collaborators nationally and internationally from other universities, different governments departments (including those of education and social development), as well as many instances of civil society (including non-governmental and faith-based organizations) participated in this network. The aim of this networked project was to have all stakeholders participating and supporting the efforts to improve on the postgraduate students' success rate with whatever contribution they could make. The project was not entirely successful in getting the buy-in and support of all participants, although it was satisfied with a few who continued to participate through emails, Skype, telephone communication and occasional physical meetings.

The networked project (the team) was privileged and honoured when a good number of postgraduate students who knew the academics during their undergraduate studies had so much confidence and trust in them that they approached them individually and sometimes collectively with the request to be supervised by them in their studies. Almost all students who ultimately enrolled in the project were practising teachers, heads of departments and principals at schools and officials in the government departments (Mahlomaholo 2012a; 2012b; 2013). On the appointed dates, a three-day workshop was convened and strategic planning meetings were held where the aim of the project and how it was to be implemented was discussed.

Prior to the meeting, the academics prepared research documents on what postgraduate learning in a cohort entailed. Other documents described the research process from its conceptualization; the formulation of the research problem; how to do a literature review guided by the objectives of the study and informed by varying theoretical frameworks; and how to design the methodology section, generate, collect and analyse the data in a meaningful way

guided by the objectives of the study and the literature. The above included documents describing how to draw conclusions and make recommendations based on the research findings. These were circulated to all in good time in advance.

What is interesting is that different responsibilities were assigned to various groups of five individuals to lead the discussions. They each had to find ways of meeting before the three-day workshops to share ideas and formulate some position on their respective topics. All had a role and a contribution to make at the planned three-day workshop and strategic planning meetings. On the appointed date, time was allocated to all groups to present their ideas to the rest of the team in the language and media they felt comfortable with, ranging from personal stories and pictures to oral PowerPoint presentations.

The first workshop started by discussing, debating and ultimately agreeing on the purpose of the project (the team), which was to *create sustainable postgraduate learning environments* where all could learn successfully in a safe environment with the support and facilitation of the supervisory team and peers. Learning successfully entailed students being able to draft research proposals that could lead to successful theses and dissertations. The team then reflected on what strengths, weaknesses, opportunities and threats it experienced individually and collectively in pursuance of this overarching goal. Out of the long list of issues generated, the five most important priorities were selected. The team agreed to implement those within given time frames. For each priority, meaningful activities, organized to enable all to operationalize the respective priorities, were identified. For example, for up to six months, progress on proposal writing was to be checked and reported by students and supervisors on a monthly basis. Next, each of the chapters in the theses and the dissertations were checked monitored and improved upon on a monthly basis until some of the studies were completed in three to four years.

Individuals and sometimes groups of individuals were assigned roles to ensure that each of those activities per priority did take place. The team even planned the resources that would be needed per activity and per priority. They collectively formulated mechanisms of monitoring the progress made per activity towards the realization of the identified priority. Among many things that the team agreed on were the roles of each of the supervisors and students (Mahlomaholo 2012; 2013a). For example, it was agreed that the team would meet at least once every month to share readings on the respective aspects of the evolving research. Members also agreed to share ideas on how empirical research evolved at these monthly meetings. Each participant also agreed to do a formal presentation, and then, guided by the acceptable procedures for doing formal research, peers would critique the work in a respectful and constructive manner.

Between the monthly meetings, the students would read and learn together in their groups of five or so in their respective localities almost on a daily basis. They were at liberty to approach any member of the supervisory team in case of need to provide clarification and support of whatever kind. The supervisory team also took turns to visit the students at their homes and schools where their research was conducted to provide support and, in general, to indicate that the team was available and that it cared about their success and what they were doing. The team did not provide any material support because of ethical reasons around creating dependency. However, students were given information on how and where to source funding for their ongoing research work. The supervisory team enquired about their well-being as persons, their families, their job situations and, where necessary, even provided advice and support on personal challenges. Sometimes it was even necessary to call them on their phones to reassure them of the continual availability of the supervisory team in cases where they went through hard times in their personal and/or academic lives. They were also encouraged to be there for one another as peers and it was emphasised that the success of all depended on the success of other team members. Students, academics and participants, as mentioned earlier, formed a caring team that moved in unison towards the achievement of its common goal. Individual supervisors also received support from the students and other supervising colleagues in times of need; they were there for one another in a trusting, reciprocal and genuine sense (Mahlomaholo 2012a; 2012b; 2013).

The supervisory team encouraged all students and one another as supervisors to do research in their respective workplaces with the intention of making a difference and effecting improvements on their theories and practices of education (Mahlomaholo 2012a; 2012b; 2013). The whole team's research was guided by design research approaches, which emphasised an understanding of the challenges, then exploring the solutions and the contextual conditions that enable success or hinder it, with the ultimate intention of formulating indicators of the success of the solutions tried out in theory and practice. The importance of doing respectful research that elevated the research participants to the status of co-researchers and fully fledged human beings, equal to researchers in status and stature, was emphasised. The theoretical frameworks informing this approach, ranging from Jürgen Habermas's Critical Emancipatory Research to Joel Kinchloe's Bricolage, were thoroughly discussed and deliberately operationalized. The team lived and interacted along the lines described in these theories.

The students investigated real-life issues in a respectful manner. They did not impose themselves on their research participants, but they were always informed by the discussions in the staff rooms and elsewhere about issues

concerning people in their contexts. Their role was to facilitate the discussions around such problems and to enable participants to help them formulate those into researchable topics. They recruited and formulated teams of stakeholders going beyond the classrooms and schools to assist in investigating issues of curriculum, teaching and learning, and educational governance from a multiplicity of perspectives at multi-layered levels and theoretical positions.

They thus deconstructed the notion of the 'expert' and recreated it as a space and place which all participants could enter and exit in collaboration with the other members in search of lasting and sustainable solution(s) to the problem. It was always recognized that people who experienced the problem being investigated were the same people who were best suited to find the solution to it (Ladson-Billings 1995). The role of the student researchers was therefore, in the same manner as at university, to enable participants to discover the power they had in themselves to resolve their problems. They assisted the participants in taking their rightful places as co-researchers and not merely as research subjects or research objects. These participants, as co-researchers, co-determined the agenda for the research being conducted. They took ownership, recruited resources and co-opted requisite expertise. They were there from the beginning of the conceptualization of research, through its operationalization up to ultimately the report writing. They remained there beyond the study period, because the project was meaningful and it helped them to improve their real-life practices.

At the end of each year, the students, together with members of their respective teams and their supervisors, continue to host an annual colloquium to which peers from the extended networks of the team are invited. These would be colleagues from other institutions locally and internationally as well as all other instances of civil society and government departments. This is usually a three-day event, where all participants present papers and share their research work in general. To capture all these activities and data meaningfully for posterity, conference proceedings are included in a dedicated, accredited journal that is usually guest-edited as well as peer reviewed. It is the wish of every student and researcher to see their names in print and this motivates all to perform even better in terms of producing quality and publishable research. In 2013 alone, the team had forty-eight papers out of 111 presented at such a colloquium, which were also published in three accredited, guest-edited journals. The project started in 2011, but to date, six MEd and fourteen PhD students graduated between 2013 and 2014. The success rates of students in other projects is 3.2 per annum, which is 50 per cent less that those going through in the Sustainable Postgraduate Learning Environments' project. Some of the schools in the country that perform better are those where students who

do research are employed full-time while doing their research. The project has grown in stature, as supervisors locally and internationally are invited to share their experiences of creating sustainable postgraduate learning environments (Mahlomaholo 2012a; 2012b; 2013).

Discussions

Structure and Academic Performance

With the new structure of the Sustainable Postgraduate Learning Environments' academic network and team that were created, it was possible for the students to find new and positive ways of relating to their peers, their supervisors, the participants in their individual projects and the learning content (as aspects of culture). This enabled them to explore and discover the power they had in themselves (see the discussion above). Their identities changed from being mere persons operating only at the level of the natural order of reality (see the data from the external examiners below), to those of being primary agents first. Next they progressed to the level of cooperate agents operating at the practical level of the order of reality, and ultimately as actors at the level of social order of reality (Archer 1996; Basen 2002; Kahn 2009; Buch-Hansen 2005; Corson 1991; Mutch 2005).

They became agents of change with a purpose to transform their otherwise contingent situation. This change was due to them being part of the team at the university, where they had the latitude and responsibility to act and contribute to their own successful learning and that of their peers (Mahlomaholo 2012a; 2013). They gradually took responsibility to organize and to lead small groups, but in the meantime became major actors who led whole teams of teachers, learners and parents at their respective schools. Because of those new roles, they had to read extensively, be knowledgeable in their subject discipline and thus 'demonstrate specialist knowledge to enable engagement with, and critique of current research practices, as well as advanced scholarship in a particular field' to negotiate successfully with diverse groups of stakeholders (SAQA 2012: 11). It therefore came as no surprise when one of the external examiners noted the following with regard to one of our MEd students' dissertation:

> [ext] This is a good study indeed. The student has been able to use the contents of literature successfully to support her argument. While the study was driven by critical emancipatory theory, which emphasises the value of justice in the people's relationships, in which people are empowered to operate on the same level of power, the student managed to juxtapose it with Transformative Learning Theory and Social

> Constructivism. This is to highlight the importance of people's thinking within their own particular contexts, in which they can define the type of learning required by them. The effective implementation of the emerging strategy is seen as a possibility if the teacher understands, from his/her own position of power as a facilitator, that learners have knowledge as well, and, therefore, encourages and introduces knowledge in the context of learners' position. [ends]

Total Persons

Another examiner commented as follows on the manuscript of another MEd student's dissertation:

> [ext] The major contribution of this study is the awareness that inclusiveness of all members of the school community, inside or outside the school premises, and handling one another with dignity, are good for the effective implementation of the strategy for sustainable learning. The researcher asserts that participants were beginning to understand the importance of equal power relations. This means the transformation of the participants as well… The student gives the exposition of some challenges that stood in the way of the framework development, which she managed to put right to enable the framework to be there. [ends]

Seemingly, the emergence of this new and powerful academic identity was made possible because the students participated in a real-life project as total human beings who related and learned from a multiplicity of sources and positions. There were many disjunctures in their lives and experiences as students, which enabled them to rethink who they were, what they were capable of and what they wanted to become. Their bodies and minds were involved in support of one another without one being collapsed or subsumed under each other. All fifteen modalities as theorized by Dooyeweerd came to play a role in their learning. They had to become teachers, leaders, strategist, lobbyists, comforters, researchers, and all as they sought lasting solutions as part of the teams at the university and in their local school communities. They were social actors who had a mission to change the relationships that produced poor performance at their schools. They were able to identify, name and address what they found to be problematic in the structures and cultures within which they find themselves. They were continuously able to stand outside themselves to critique, reimagine and readjust them from an informed position. One examiner had the following to say about another PhD student's work:

> [ext] Throughout the extensive literature review, the candidate demonstrates an appropriate awareness of sensitivity towards issues central to content, social and cultural conditions relating to the complex matter of learning mathematics. [ends]

Knower Versus Knowledge

Another analytical duality between the knower and knowledge became apparent, namely that the students were able to stand outside of themselves and reflect intensively on how they created knowledge, thereby being able to self-regulate their own understanding through constructive self-critique as noted by the external examiner above. The students were thus able to take the position of the other in looking at themselves and their work. They managed successfully to change how they regard themselves and how others look at them. The knower remained distinct from knowledge. The former remained continuous. The process of an emerging identity was repeated continuously in different analytical dualities of body and mind, structure and agency, and ultimately of knower and knowledge. The ever-continuing morphogenetic cycle made possible by the independent reality whose properties do not depend on our knowledge grounded new ways of learning and of being. For example, the human body does not depend on the human mind, and vice versa, for its being. Reflection and reflexivity continue to fuel the process of transformation from the state of not knowing to those of knowing, but also knowing that there are others forms of knowledge not known by the candidate as researcher as well. We witnessed great transcendence by the postgraduate students beyond levels of performance they never imagined themselves to be capable of achieving.

Conclusion

In the above discussion, we assume that Margaret Archer's realist social theory is an operational version of Roy Bhaskar's critical realism. With this assumption, we highlight a few of the many ideas of realist social theory that enabled us to talk meaningfully about the learning of postgraduate students supervised at a university in South Africa. Very central to the whole argument are the concepts of agency versus structure and agency versus culture, which are separate and different from one another, but emerge from interacting with one another. We have shown how the persons of the students who, under normal circumstances, would have been marginalized, became powerful agents and social actors with a purpose to rebuild the education system. Some of these students were ultimately capable of the highest levels of conceptual

sophistication demanded at postgraduate level as described in South Africa's policy documents, SAQA and the NQF.

Archer's theory is not without limitations in developing the understanding we were looking for, but under the circumstances it was the most useful compared to others such as Anthony Giddens's structuration, Jacques Lacan's post-structuralism, and others. Even the performance of our postgraduate students was not perfect. The fact that twenty out of fifty have graduated implies that a lot of work still has to be done to enable even more students to achieve academically beyond the levels they imagined possible. At least a start has been made towards enabling the mature students who are parents and leaders in their other spheres of life, but were rendered powerless when it came to their academic aspirations. In short, Archer has provided us with a transcendental theorization that enables us to imagine a future of postgraduate learning much improved than is the case currently. Seemingly, we cannot blame the situation or the context or history anymore, because we are capable of interpretation and acting according to our own understanding of the situation. We can still create history even if this is not under conditions of our own choosing.

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