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Abstract. *Collaboration and synergy among education stakeholders is a fundamental pillar for any educational reform success. The reported research analyses the state of collaboration and work dynamics that existed between natural science district officials and primary school teachers in the Eastern Cape Province, South Africa.*

Data were collected through interviews conducted with science district officials and teachers and policy document review. The results focuses on past previous experiences with officials as barrier towards effective collaboration, work dynamics between science district officials and science teachers in their districts, impact on and implications for curriculum reform implementation and professional development. It is argued that effective collaboration between district officials and teachers is a hallmark of curriculum reform success, teacher growth and success in the workplace, which result in student academic achievement. Effective collaborations are built around trust in individual's professional integrity and are characterised by professional candour, appreciation of individuals and understanding. In conclusion, it is imperative for district officials and teachers to improve communication and strive for effective collaboration, mutual respect, and power sharing rather than domination of one group by the other.

Key words: *district officials, science teachers, primary schools, collaboration, South Africa.*

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ANALYSIS OF THE STATE OF COLLABORATION BETWEEN NATURAL SCIENCE SCHOOL DISTRICT OFFICIALS AND PRIMARY SCHOOL SCIENCE TEACHERS IN SOUTH AFRICA

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Introduction

The reported research discusses the state of collaboration and work dynamics that existed between natural science district officials and their primary school science teachers in the Eastern Cape Province (EC) in South Africa (SA). Collaboration and synergy among education stakeholders is a fundamental pillar for any educational reform success (Sandlin & Feigen, 1995). It is considered as a powerful and effective mechanism for social change (Australian Research Alliance for Children and Youth, 2013), as naturally inspiring a sense of community (Campbell, 2013), and as an esteemed means to an end (Nixon, 2014). Friend and Cook (1990) view collaboration as a style for interaction between at least two co-equal parties voluntarily engaged in shared decision-making as they work towards a common goal. According to Nixon (2014), social organizations thrive where there are diverse and complimentary systems that enhance the lives of others. Nevertheless, there are certain key elements that need to be observed to ensure successful collaboration. The University of Vermont and PACER Center (2008) state that collaboration requires team members to synergise towards a mutual goal and is based on a strong sense of purpose and shared responsibility. They add that collaboration is based on a sense that all participants are valued, embraces the unique perspectives of all and requires trust. Similar conditions are also identified by Friend and Cook (1990) including the need for (a) mutual goal, (b) parity among participants, (c) shared participation, (d) shared accountability, (e) shared resources, and (f) voluntariness. Collaboration, in Anderson (2003) view, is essential to developing and sustaining goal consensus, shared beliefs, and commitment to reforms. Be that as it may, literature also cautions that achieving authentic collaboration has proved to be a challenge; therefore, it requires continuous facilitation and support (Ainscow, Muijs & West, 2006).

The South African Department of Basic Education (DBE, 2011) also believes that there is a clear need for much stronger collaboration between the many different stakeholders in order to successfully respond to myriads



challenges that confront their education system. The district officials and teachers are key drivers and play crucial role in transforming the education system from the ground level. Accordingly, district offices/officials are tasked to collaborate with and support schools and teachers so that they in turn can be effective and successfully deliver on their own mandate (DBE, 2011). The National Development Plan [NDP] 2030 Vision (The Presidency, 2011), which is the long term vision and strategic plan for SA, views teachers as central to education and that teaching should be a highly valued profession. However, without thoughtful and productive collaboration with each district officials the task of ensuring that schools succeed in the mission to foster and maintain basic quality education for all is impractical. Collaboration between these two groups is fundamental and serves as a catalyst in the reform process and improving the standard of teaching, learning and performance outcomes. Bantwini (2013) believes that if school districts can effectively play their role, collaborate and synergize with science teachers including other stakeholders that will increase chances to yield the desired results in student performances and schools. Focus on these two stakeholders (teachers and district officials) does not necessarily mean they are the only critical elements in reforming SA education; teacher unions, Non-Governmental Organizations, School Governing Bodies, parents and others also play a vital role. However, due to space, focus will be limited to these two groups for now.

Despite the proclaimed significance of collaboration, analysis of the state of collaboration between primary school science teachers and science district officials is a relatively under-explored research area, especially in South Africa. This paper seeks to address the following questions: (1) what is the state of collaboration between science education district officials and science teachers in some districts in the EC? (2) What are the work dynamics between the district officials and science teachers in the district? (3) What impact does the kind of their collaboration have on the new curricula reforms?

The NDP (The Presidency, 2011) underscores the importance of high quality science and mathematics teachers. Science education in SA has recently been receiving some but not sufficient attention from various stakeholders, due to students' poor performances in international assessment studies such as Trends in International Mathematics and Science Study (TIMSS, 1995, 1999, 2002, 2011). The former Minister of Education (Pandor, 2008) identified the dismal performance of students in science and mathematics as a major concern and a factor that contributes towards skills shortage impacting the country's economy. The need for improvement in science education has been emphasised by several studies (Bantwini, 2010; Reddy, 2005; Centre for Development and Enterprise, 2007). Anderson (2003) argues that effective solutions to challenges involving student learning, teacher learning and organizational change are more likely to emerge through professional collaboration. Collaboration between district and teachers, according to Sipple and Killeen (2004), can help develop accountability critical in the state led-reforms. Thus, given that district officials are a major source of capacity building (professional development for teachers) for schools, it is befitting to investigate their state of collaboration with the teachers and ascertain the implication for curriculum reforms and district professional development.

Following is the background to primary school science education, then research methodology followed by the results of the study, discussion and conclusion.

Background to Primary School Science Education

The National Development Plan Vision 2030 (The Presidency, 2011) maintains that good science and technology education is crucial for SA future innovation and vital to development as they underpin economic advances, improvement in health systems, education and infrastructure. It asserts that science and technology are the differentiators between countries that are able to tackle poverty effectively by growing and developing their economies and those that are not. Nonetheless, the SA primary school science education has for a while been struggling to receive the due attention currently enjoyed by the high-school level. Bantwini and Diko (2011) reveal that the intermediate-phase (4-6 grades) science teachers expressed some concern regarding the neglect of their phase level by the district officials, as they were not the exit-phase (grade 12) in the schooling system. This neglect has caused frustration for many teachers who are struggling to implement the new curriculum reforms in their classrooms. Concurrently, literature on neglect of science education has also been thriving (Bantwini, 2010 & 2012; Centre for Development Enterprise, 2007 & 2004; Rogan & Grayson, 2003). For a while the focus has been on the high school level with intentions to ensure increased passed rate that will eventually register for science degrees at tertiary level. Arguably, the system endeavoured to repair the leaking roof whilst neglecting the collapsing foundation. This neglect adds to a plethora of existing challenges that confronts learners and teachers. Studies show that in general, SA science teachers are struggling due to inadequate science content knowledge



and pedagogical skills and lack of confidence (Bantwini 2010 & 2012; Centre for Development Enterprise, 2007 & 2004; DBE, 2013; Muwanga-Zake, 2003). These struggles are to a degree attributed to the nature of teacher training that many teachers received during the apartheid era. Muwanga-Zake (2003) views teacher challenges, including their deficiencies in practical skills and conceptual understanding, as being passed on from teacher to learner. The learner later becomes a teacher, thereby perpetuating the cycle from one generation to the next. He contends that poor teacher education could also account for teachers' verbatim reliance upon textbook notes and chalkboard teaching and their inability to use science equipment.

Further contributing to primary school science education challenges is that the subject is mostly taught by teachers who did not specialise in it (Bantwini, 2010; DBE, 2013). These are teachers who were temporarily asked to teach as their schools awaited appointments of specialised teachers by the Department of Education (Bantwini, 2010 & 2012). The appointment process is usually protracted as there is an extensive shortage of teachers in this area, especially in the Eastern Cape Province [EC] (Bantwini, 2010). The investigation on the implementation of mathematics, science and technology education in the province undertaken by the Department of Basic Education also confirms a state of crisis (DBE, 2013). Consequently, the education department provides in-service teacher workshops intended to enhance subject content knowledge and pedagogical skills. The number of workshops per annum varies depending on a district goals and ability to deliver on their schedule (Bantwini and Diko, 2011). Nevertheless, studies have shown that most school districts struggle to support all the primary school science teachers due to overwhelming numbers that they have to serve. According to Bantwini and Diko (2011), some science district officials have admitted to being unable to provide adequate support to their teachers for various reasons including lack of human power, financial, time and other resources. Clearly, these challenges require close collaboration between both teachers and district officials to succeed in their mandates. Furthermore, this has implications for teacher professional development provided by the school districts.

Research Methodology

The reported qualitative research was conducted in eight school districts in the Eastern Cape Province (EC), South Africa. The province comprises 23 districts that are grouped into three clusters: A, B, and C. The sampling criteria focused on the districts' geographic positioning, ensuring that all three clusters were represented in the study and the district directors willingly permitted the research to be conducted in their districts.

Participants and Sampling Selection

The study focused on eight Natural Science (NS) district officials, one from each district; however, only six were successfully interviewed. Though they had all consented to being interviewed, the other two district officials had casual discussions with the researcher and were not formally interviewed due to time constraints resulting from their busy schedules during the data collection period. In the EC, it is common to find one district official in charge of science education in the entire district comprising of an average of 239 schools. All the districts officials were black South Africans, four (67%) were males and two (33%) females. One of the male's age ranged between 35-40 years, one was between 45-50 years, and two were between 50-55 years. While, the female's age ranged between 45-49 years and 50-54 years. The targeted officials worked with the intermediate phase (4-6 grades) science teachers. Their responsibilities included providing teachers with new curriculum policies from the Department of Basic Education (2011); interpreting the policies in ways that are comprehensible to teachers; supporting teachers with content knowledge; conducting workshops for teachers; monitoring the implementation of new policies in schools, to mention but a few. The Department of Education (2005) believes that educators and their institutions need to constantly learn and grow, and must have on-going support in order to achieve this goal.

In-depth semi-structured interviews that lasted 60-90 minutes were conducted with district officials. The interviews focused on their roles and responsibilities, nature of their collaboration with teachers, kind/s of support provided to the teachers, existing work dynamics between them and teachers, views about the new science reform policies to mention a few. Boyce and Neale (2006) view in-depth semi-structured interviews as useful when you want detailed information about a person's thoughts and behaviour or to explore new issues in depth. Four interviews were tape-recorded with the participants' permission, while, in the other two, notes were taken. The recorded interviews were later transcribed verbatim.



In addition to the district officials, 25 intermediate-phase teachers were interviewed using semi-structured interviews, each lasting 50-90 minutes. The teachers were purposively selected based on teaching natural science at the Intermediate phase, their willingness to be interviewed and varied teaching experience. From the teacher sample, 83% were black, 13% coloured and 4% white. About 70% of the teachers were females and 21% were males. From the females 84% were black, 11% were coloured and 1% was white. Their age ranged was: 5% (25-29), 11% (0-34), 37% (35-39), 16% (40-44), 11% (45-49), 5% (54-59) and 10% (60+). About 80% of the males were black and 20% coloureds and their age range were: 20% (30-34), 60% (35-39) and 20% (45-49) of age. The interview purpose was to determine the state of collaboration and support they receive from their school district. Teachers were purposively selected based on their willingness to be interviewed, varied teaching experience and gender, among others. Some interviews took place in the teacher's classroom while others were conducted in the staff room. All the interviews were tape-recorded with the participants' permission and later transcribed verbatim. Reference to these interviews will occasionally be made to ensure clarity on certain issues whenever necessary.

Additional to the interviews, two policy documents were reviewed: Department of Department of basic Education (2011) guidelines on the organisation, roles and responsibilities of education districts and Education (2005) Conceptual and Operational Guidelines for the Implementation of Inclusive Education. The review focussed on the role of district officials and nature of collaboration expected between them and the teachers.

Data Analysis

The coding and analysis of the interviews followed an iterative process as recommended by Miles and Huberman (1994). These authors describe various steps that include "...reading and affixing codes to the transcript notes while noting reflections or other remarks in the margins; sorting and sifting through the materials to identify similar phrases, relationships between variables, patterns, themes, distinct differences between subgroups, and common sequences; isolating these patterns, processes, commonalities, and differences..." (Miles & Huberman, 1994, p. 9). The above process helped in generating the themes being discussed below.

Results of Research

Following in this section is the discussion of issues generated from data analysis. These issues include: Past previous experiences with officials as barrier towards effective collaboration, Work dynamics between science district officials and science teachers in their districts, Impact on and implications for curriculum reform implementation and professional development. Throughout the paper pseudonyms are used to protect the identities of teachers and the district officials.

State of Collaboration between Science District Officials and Science Teachers in their Districts

Past previous experiences with officials as barrier towards effective collaboration

Findings from the reported study reveal that events from the past were still a barrier toward effective collaboration. The science education officials believed that teachers harboured suspicions and discomfort with regard to professional interactions with the district offices. These suspicions are attributed to the historical relationship that previously prevailed between the two parties. The district officials, then known as inspectors, allegedly abused their authority and mistreated the teachers. The seriousness of these allegations resulted in district officials being banished from visiting classrooms, a process championed and facilitated by some of the teacher unions in SA. The rejection of teacher inspection was due to the victimisation of teachers; the unconstrained power and abuse of patronage wielded by inspectors; difficulty in challenging the inspectorate's assessment; incompetence; secrecy; irrelevant evaluation criteria; absence of contextual factors; arbitrariness in the appraisal processes; and abuse of merit awards (Human Sciences Research Council, 2005; Jansen, 2004; Chisholm, 2004). The implications of the banishment were that district officials would not visit classrooms to observe and assess teachers' work progress as was customary. If teachers needed support from the district officials, they were expected to either visit their district offices or wait for a workshop to be convened. Until recently, the nature of their collaboration has been strained and awkward.



The district officials were convinced that most teachers continue to perceive them in their previous capacity as inspectors who 'policed' them. They believed that teachers did not generally relate well to them, although much had changed since the democratic era in SA. One district official noted:

Another thing that we need to touch before we come to that question is that of the relationship that teachers have with the district support structure. In the past, the district support structure was hated; it was thought of as the mouthpiece of the previous regime. And then there was this kind of conflict between teachers and the support structure in the form of the inspectors. That thing is still in their minds long after that thing has been relegated to the dustbin of history; but it's still in the minds of our teachers. They still view the district support staff as kind of inspectors, as bosses and so on.

This past experience continues to prevent teachers from freely collaborating with district officials. The perceived hegemonic power structure that existed during the apartheid era continues to dictate the nature and terms of interactions between science teachers and district officials. Consequently, communication and decision-making processes continue to be top-down, lacking a teacher buy-in of the reform process. Apparently, their collaboration is also clouded by issues of trust, confidence, and honesty. The district officials viewed these issues as detrimental to collaboration that ought to ensue with the teachers. This is cogently captured in the following observation by the district official:

That kind of an attitude, you know, has never changed that much, though at times they pretend... But still, in the back of their mind, they still think that you are their boss, their superior; you are the government, whatever. You are not on their side; rather, you are on a witch hunt and you just want to see where they miss it (*do a wrong thing*). That kind of attitude is still there in the minds of most of our teachers, which is another challenge that blocks the effectiveness of the support that we give. (Mr Xman, district official)

Lack of teacher support

The interviewed science teachers echoed challenges regarding collaboration with science district officials. Their major concern was lack of classroom support from their districts, especially after workshops. Teachers conceived this lack of support as a major obstacle to their development and reform implementation:

I don't want to lie, classroom follow-up by the EDOs (education district officials) is completely not there ...In the case of natural science...who is responsible for the area, I don't even know. (Mrs Sony, science teacher)

From the teachers' perspective, it was clear that there was no healthy relationship and collaboration between these two parties. The relationship was mostly one-way, the district officials deciding on workshops without prior engagement with teachers in regard to the scope of professional development required:

The subject advisors sometimes send the circular to the school in a short space of time. These circulars are addressed to the principal. Then the principal call for a meeting and reads it to the teachers or just circulate to the teachers and ask each teacher to sign in acknowledgement of receipt. (Mrs Nzali, science teacher)

In another district the teachers had this to say:

There are no workshops for science content knowledge. The district does not ask us if what the challenges are. They decide on their own without even consulting us. (Mrs Hlathi, science teacher)

The above claim was verified with the district official in charge and he confirmed it:

...when I got here, I learnt that there have not been workshops with natural science up to grade nine. You see the situation of districts not having enough human resources have let the curriculum down. You see,



in this district before I came in January we had only four subject advisors for grade R-12 for all learning areas. (Mr Tally, district official)

Another district official was also asked about how they work with their teachers

...let me be honest with you, each and every term we are supposed to meet with the teachers, but I cannot be effective because maybe I am in charge of many phases. When I am talking about the intermediate phase, it's not easy for me to meet with all of them because there is this challenge which is senior phase. (Mr Vela, district official)

Based on the above interviews, lack of teachers support and communication was regarded as a big issue. Even after the workshop, there was a lack of follow-up in schools that will benefit the implementation of the newly acquired knowledge. A shortage of human resource in the districts was attributed as the cause for the lack of support. The Australian Research Alliance for Children and Youth (2013) argues that Collaboration demands participants forge new relationships and learn new ways of dealing with each other.

Work Dynamics between Science District Officials and Science Teachers in their Districts

Communication issues between district officials and teachers

The district officials mentioned that teachers viewed them as experts and saw themselves as novices when it comes to science education. The district officials viewed teachers as uncomfortable to communicate their challenges and the kind of assistance they required from their district office. The officials believed that teachers regarded them as experts in science, an element that hindered discussion during workshops. Some officials perceived this as evidence of teachers' lack of confidence to seek help:

What I have observed with our teachers in the intermediate-phase level is...people who are not confident about the subject matter for many reasons, one of them being that because of job shortage, they found themselves having to grab whatever job is given to them or whatever location in the school. (Mr Malti, district official)

Some teachers refuted the claim that they do not seek help from their district officials:

...I do go to their office with my bare feet when I have something I don't understand, and they will promise and promise but never come, and next you will meet them at the workshop and they never come just to visit the school. (Mrs Nzali, science teacher)

From both the district officials and teachers it was evident that there is a challenge of communication before, during and even after the workshops in school districts.

Parity issues and power dynamics between district officials and teachers

The issue of parity and power dynamics also existed between these two groups. The district official's hypothesis was that teachers would not dare question them for fear of being judged or perceived as less knowledgeable about the subject they were supposedly qualified to teach. Teachers were said to be cognisant of their status in relation to district officials, an element that seemed to be a barrier towards a development of a healthy work relationship and collaboration. District officials noted their willingness to assist teachers who were experiencing challenges in implementing the reforms, however, most teachers would not seek the help that they required as expected:

You will find guys (teachers) running around trying to cover their backs, pretending and doing false things because they think that now there is a 'witch hunter' who is trying to find their mistakes or something like that. (Mr Xman, district official)



The above claim was refuted by some teachers who argued that they do consult their district officials, especially for classroom assistance, but unfortunately, they hardly ever received it:

I have never received any assistance from them, but I do visit them in the district office and inform them about the nature of my problem. Because of their busy schedule, they never come and later will say that they forgot. (Mrs Nzali, science teacher)

Another teacher revealed that:

There are no science workshops in the district. The last time we had them [was] in the 90s. Now I don't want to even lie, I don't know who is responsible for the area in our district. We have not had any workshop of NS that we were asked to attend. The other problem that we're confronted with is that the district office sends SMS (*short message service*) to notify us about workshops. We no longer have the circulars as before; in their SMS maybe I do lose out... maybe (Mrs Ndlela, science teacher)

The need to effectively collaborate was apparent from both parties. However, it was also clear that nothing was being done to develop/nurture effective collaboration between these parties. There was a clear communication breakdown between teachers and district officials as there were no clearly identified communication channels, thereby creating detachment between the two groups.

Mismatched expectations

Further highlighted was that during workshops teachers would expect to be handed materials that they could take back to their schools. If not handed any materials, such as pamphlets or handouts, they were likely to view the workshop as unproductive and to, therefore, determine that it had not met their needs:

...but most of the teachers, but most of the teachers prefer if you give them, they want something that they can carry home and interact with it and they will try to link what they have heard and what they have seen. In any kind of training development or workshop if there is nothing they could relate to what you have been saying, then it becomes useless and meaningless. They are unable to understand and it would look like it was a waste of a workshop. (Mr Malti, district official)

This attitude was prevalent among teachers working in the previously disadvantaged Black schools that were still struggling with teaching and learning resources (Bantwini, 2010; Bantwini & Diko, 2011). The other type of schools, the ex-Model C schools (previously semi-private schools in former white suburban areas), were said to have sufficient material resources by the district officials. Whereas, most black schools from the EC are still characterised by severe educational challenges.

District officials' assumptions/perceptions about some ex-Model C school

According to some district officials another challenge that confronted them was the alleged 'resistance' of ex-model C schools to collaborate with them. These schools were said to be still characterised by a large contingent of white teachers and very few black teachers. Ironically, most of the ex-Model C schools have a large enrolment of black upper-middle-class students with few white students and other races. One district official noted that:

The problem in our district is that it is a bit diverse (*comprises blacks, whites, coloureds, etc. racial groups*), in this form, teachers who are at a former Model C school, because 35% of our schools are ex-Model C schools, the white schools, are more resistant to change.

District officials viewed the ex-Model C schools as reluctant to accept support from their district offices, especially if the district officials were black. Furthermore, when they visit their schools, they would not welcome them as they did not recognise their support:



...they make their schools, you feel like guest when you visit them. You are not like a person who is there to support them. They don't see you like a welcome support, but that is totally different with the other schools that are not former model C schools. Well because they are affluent in many ways, transport whatever, there is a tendency of thinking that when you call them you are actually disrupting schooling.

District officials believed that they were perceived by ex-Model C schools as incompetent. Referring to their non-attendance of the district organised science workshop an official noted:

...to a certain extent they feel that there is part of incompetence and they think its wasting their time to live their classrooms and kids unattended to listen to a highly incompetent guy wasting their day on something they could get at a price but at a better standard. (Mr Xman, district official).

Mr Xman alleged that former model C schools also lacked confidence in the national curriculum. He noted that they were not convinced by the current government education policies, which they regard as lowering the education standard. Reasons for their resistance were said to be racial to a certain extent and the fact that they possessed adequate resources.

...so, to a certain extent, they are very negative on NCS (the National Curriculum Statement). And also they feel that they have enough infrastructure and funding to have what they think their client wants to buy, which, in any event, is not what the government wants them to implement. Therefore, they resist what they know is lowering what is marketable in their own kind of understanding.

Despite the district officials' perceptions that ex-Model C schools were not willing to collaborate with them, they were also commended for their good job:

They do quite a very good job, they do a very good job, outstanding job and very diligent and you can see their lesson plans, their things and their system are all in place and there is great order, they are just on top of it.

As evidence of the pessimism, some science teachers from the sampled former model C schools in the province declined to be interviewed for the study, stating that they were busy with last-quarter curriculum revision. This made it impossible to triangulate the data and obtain their perspective on the district officials' claims.

Impact on and Implications for Curriculum Reform Implementation and Professional Development

Though the state of teacher-district official work dynamics and state of collaboration was not seen as being in crisis by some officials, the impact was evident in the lack of/slow curriculum reform implementation. Several teachers were perceived by district officials as still lacking a clear understanding of the new reforms, thereby inhibiting policy implementation:

...I don't know somehow I feel, particularly if I can relate it to the new curriculum, to a major extent I can say that teachers have not yet taken, they don't have a full grip of the reforms. They try to understand but.....

Most teachers were perceived not to be capitalising on the in-service workshops held in their respective districts. This had an impact on the district official who facilitated the workshop and deprived the teachers of the opportunity to explore and learn about classroom realities from other teachers. However the district officials contradicted each other as one indicated a challenge of teachers teaching more subjects, which becomes difficult to find them even when visiting their schools:

You go to a school; first we cannot go all of us (district officials) because the same teacher could be responsible for a number of learning areas. One teacher will have to move from one district official to another. (Mr Tally, district official)



The purpose of district facilitated professional development is to ensure that teachers are well informed and up to date on new research or strategies that will better their teaching, classroom management and assessment and student learning. This learning becomes easy and beneficial when the two parties effectively collaborate starting on planning to the delivery and maintenance of the learning.

From the district officials' perspectives, it was evident that the nature of collaboration with some schools, especially former model C schools, was unhealthy. However, when the district officials were asked to explain how they were dealing with such schools and to identify strategies that they viewed as viable for mending and restoring trust with them. One district official blamed the attitude and behaviour of former model C schools for their own neglect:

.... due to the amount of work and great numbers of teachers that we need to attend to, you tend not to bother about those who do not look like they welcome your support. It gives you a bit of a relief to be able to focus on those who are crying out for your help, because in any event you were not going to give justice to 450 schools in your district.

It was evident that the district official saw the former model C resistance as an issue about which they needed not worry. There was no indication that they were bothered that these schools were not participating in the reform process and had no intention to address the issue. Also apparent was the belief that most of the former model C schools were not implementing the government's recommended curriculum in their classrooms, a type of behaviour that was described as non-existent in other schools, especially those in black communities.

Study Limitations

This research acknowledges that the data used here may not be sufficient to generalize about the conditions of all the districts in the province. Nonetheless, this study provides a window for viewing how other districts are surviving during this education transformation period in South Africa.

Discussion

Clearly the reported districts are confronted by challenges that have implications for teaching and learning, natural science curriculum reform implementation and district facilitated professional development. Some of these challenges are historically rooted in SA's gloomy past, which employed the divide-and-rule principle (district officials against teachers) to pursue its political agenda. This explains the deeply entrenched teachers' suspicions towards district officials' work with them. Undoubtedly, the work relationship and collaboration dynamics between district officials and teachers is not conducive to synergetic purposes or development of a productive community. Their state of collaboration can be described as power-authority driven, top-down in nature, and creating an 'us versus them' situation. There is a perceptible chasm between these two parties that makes one wonders if what changed because most of the district officials are former school teachers. They have previously worked with some of the teachers that now they have to support. Also, it is my contention that the issue of trust between teachers and district officials is a critical challenge whose resolution is long overdue, yet, ironically, not receiving the attention it deserves. It is an issue that can no longer be overlooked with the hope that the desired change will simply occur. Certainly, time is a crucial factor in healing the past injustices, however, initiation of the process to repair the broken relationship and synergy should take priority.

It is argued that district officials possess an advantageous position to initiate such change as they have power, authority, capacity, and influence over schools and teachers. They control and co-ordinate all the policies and programme implementation in their local schools. They possess power and capacity to organise meetings intended to improve their collaboration with teachers (DBE, 2013). McLaughlin (1992) note that district officials need to initiate and facilitate discussion regarding how teachers feel about their work and whether they see district policies and practices as supporting or inhibiting their practice or sense of professional worth. As futile and time-consuming this process might seem, I argue that the success of any new reforms depends on the good working relationships, collaboration and synergy between local district officials and teachers. Reina and Reina (1999) argue that when leaders (district officials) create a trusting working environment, people are safe to challenge the system and perform



beyond expectations. Employees feel greater freedom to express their creative ideas and are willing to take risks, admit their mistakes, and learn from those mistakes (Reina & Reina, 1999). The lack of effective synergy only leads to complications that can only serve to inhibit the desired outcomes. Further to consider, as Sandlin and Feigen (1995) note, is that collaboration can require a great deal of time, hard work and mostly, more thought, carefully articulate goals and planning in order to succeed.

In addition, it is argued that there is a correlation between the extent of investing trust in the individual and productivity as return on investment. Speck and Knipe (2005) contend that trust and collaboration are hallmark conditions that must be present in order for learning to develop and for teachers to grow, however, these are not easy conditions to establish. Since the dawn of democracy, South Africa has had a wave of curricula reforms that requires teachers to continuously learn about new policies (curriculum, assessment, norms and standard, etc.). This learning is facilitated by the district official and therefore its success requires trust and confidence on each other. Individuals who feel trusted are more likely to deliver on expectations than those who do not share this sentiment. The more teachers trust their officials, the more freely they will collaboratively engage them on issues surrounding the challenges they face, as well as those related to new reform implementation, a process leading to mutual trust. Teachers, most of whom are in need of assistance, will feel free to discuss their uncertainties and invite officials to their classrooms. According to Reina and Reina (1999), our capacity to trust in others is critical to our working relationships since it is a force that holds us together and influences our performance. McLaughlin (1992) makes a case for the significance of districts altering their culture as a means of supporting the reforms. She contends that powerful relationships between teachers and districts have little to do with hierarchical structures of control and everything to do with the norms, expectations, and values that shape districts' professional communities. As Roberts (2001) indicates, South African district offices have a particular role to play in working closely with local schools and ensuring that local educational needs are met. This may not come naturally, but efforts have to be made and sufficient time invested. In the beginning, scepticism on the part of the teachers may be expected however, honesty and dedication to the process are required to ensure that a trusting community prevails. In their study, Spillane and Thompson (1997) found that interpersonal trust is a prerequisite for genuine collaboration and conversation about instructional reform, and it provides occasions for educators to learn about the reform by interacting with each other. They argue that trust must be nurtured step by step and must be constantly reinforced by leaders and teachers at the school/district level. However, they caution that nurturing these collaborations is more difficult because organisation structures are usually more complex and relations between administrators and teachers are typically more formalised. This collaboration should also be encouraged even among teachers as it affords them an opportunity to gain insight into each other on the practical problems of trying to revise practice. Spillane and Thompson note that collaborations allow the more knowledgeable teachers to contribute to the knowledge of others, thereby helping to foster the development of a more knowledgeable cadre. As Gibbons, Zammit, Youngentob, Possingham, Lindenmayer, Bekessy, Burgman, Colyvan, Considine, Felton, Hobbs, Hurley, McAlpine, McCarthy, Moore, Robinson, Salt & Wintle (2008) suggest, among the factors to consider is the improvement of communication between the different cultures, the development of reward systems that recognise effective collaboration, as well as mutual respect and power sharing rather than domination of one group over the other. During this process, district officials should be accessible and maintain regular contact with teachers and their schools. As McLaughlin (1992) highlights, the success of the professional community requires on-going attention from and support and prioritisation by district officials.

The issue of collaboration between former model C schools and their school district is critical and requires further close attention. Simply allowing former model C schools to operate as they wish because they do not value district officials from other racial groups will not help in the integration and reconciliation efforts that are being forged by the SA government. Also, alienating these schools because they are unwilling to cooperate, they have sufficient resources, and/or are able to service their clientele poses a danger to the entire education system. This continued split in the way in which the education system functions nullifies the government's efforts to use education to unite the SA citizens. The district officials' feeling of powerlessness to work with former Model C schools requires attention and the implementation of measures that will promote reconciliation. Narsee's (2006) study makes similar observations, pointing out that a female district official was not accepted as a leader by an Afrikaner speaking principal. Describing the challenges that district officials had to endure post 1994, Narsee (2006) mentions that, district officials are left on their own and have to work hard against the tide of resistance and aggression from schools that do not offer the loyalty that district offices need in order to carry out their responsibilities. Though this issue cannot be given sufficient attention in this paper, it is proposed that further investigation be considered



in the future. Fullan (1992) suggests that sustained improvement requires serious restructuring of the schools, the districts, and their interrelationships, and that schools and districts will never be able to manage innovation without radically redesigning their approach to learning and sustained improvement.

Based on the reported findings, I also argue that the success of the schooling system in SA depends mainly on effective collaboration between the districts and schools as they are operating on the ground level, as well as the many other key stakeholders. In SA teachers rely heavily on professional development facilitated by the district, which is viewed as key in ensuring that the country achieve its goal of quality basic education for all. Recently, the DBE (2011) launched its *Action plan to 2014: towards the realisation of schooling 2025*. This is the country's first long term sector plan for schools. The success of this new plan, without any doubts, depends on effective collaboration and understanding between the teachers and district officials.

Conclusions

The issue of effective collaboration between natural science teachers and district officials is critical and worthy of more attention due to its implications for the implementation of new science education reforms and district professional development. Effective collaboration may create a shift from traditional top-down command-and-control relationship currently existing in most districts to relationships in which district officials can effectively support schools. This may ensure that teachers are completely involved in key decision making, including how to improve student learning and performance. This may also ensure that both parties are in on-going communication and aware of existing challenges and approaches to resolve them. The collaboration may also increase the impact of district professional development on teachers. Furthermore, it may also ensure that there is a maximised use of limited resources for the benefit of many previously disadvantaged schools and learners. Clearly, the progress of establishing this state of collaboration will not happen overnight but initiation and dedication to this process is likely to yield the desired state of effective collaboration among the various education stakeholders.

It is suggested that more research focusing on school districts and their mandates should be undertaken. This may help unearth all the issues requiring immediate attention in order to correct the schooling crisis that confronts South Africa. Furthermore, research focussing on how trust can be developed among the different types of schools and district officials will be of value.

Notes

1. Collaboration is used as referring to the collective work of two or more individuals where the work is undertaken with a sense of shared purpose and direction that is attentive, responsive, and adaptive to the environment (Beyerlein and Harris, 2003).
2. "District officials" is used to refer to curriculum specialists in science, mathematics, and technology education or natural science district subject advisors.
3. In SA Science education is referred to as natural science and therefore these terms in this paper are used interchangeably.
4. In South Africa a Coloured person is a racially mixed individual.
5. Former Model C schools are schools that during the apartheid era were accepting white learners only. They are government schools that are administrated and largely funded by a school governing body of parents.

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