

https://dspace.org/

The role of corporate social investments on teacher development in schools : a research study on mathematics initiatives in public schools supported by the Epoch and Optima Trusts.

Madisha, Edwin Mohlopi

2013-10-01
http://hdl.handle.net/10539/13173

Downloaded from a DSpace repository. https://dspace.org/

The Role of Corporate Social Investments on Teacher Development in Schools. A research study on mathematics initiatives in public schools supported by the Epoch and Optima Trusts

EDWIN MOHLOPI MADISHA

STUDENT NUMBER: 9908458T

SUPERVISOR: DR NICK TAYLOR

Research Report submitted to the Faculty of Education,

University of the Witwatersrand, Johannesburg,

in partial fulfilment of the requirements for the

Degree of Master of Education

Johannesburg 2012

ABSTRACT

Improving learner achievement and performance remains a global challenge for many governments, especially in developing countries. Countries spend a sizeable percentage of their national budgets on education with the hope to achieve desired learner outcomes. In South Africa, legislation has made provision for companies to contribute 1% of their net profit towards social development, including education. It is within this background, that the Epoch and Optima Trusts invested significant sums of money to improve the quality of maths results in secondary schools.

The study investigates school level activities to ascertain whether and to what extent these may be implicated in improved teaching practices leading to improved performance. We interrogate the assumption commonly stated in the school effectiveness literature that teaching practices in schools are stimulated and facilitated by activities occurring at that school level. The literature is inclined to the view that whatever happens in classrooms is influenced by school level instructional leadership practices, professional development of teachers and the maintenance of internal accountability measures.

We preferred to make use of case study research method in order to explore teacher practices in schools because the purpose is to understand behavioural detail and impact mechanisms. A matched pairs sampling technique was used to select four schools from a population of 78 public schools which were continually supported by the Trusts over a period of two years. One pair was classified as former Model C schools (one high performing and one low performing), while the other pair consisted of two former Department of Education and Training schools (one high performing and one low performing). This design reduces the socio-economic and cultural differences between the two schools in each pair.

A framework was derived from the literature to guide the collection and analysis of data. The framework commences with the three categories of school level practices, disaggregated into

eight specific activities. A set of indicators was then formulated to assess the degree to which each of the specific practices was present in schools. Collective responses of four interviewees at each school were rated and triangulated during this process.

Given the nature and the size of the sample, we cannot generalise on the basis of four case studies. However, the value of this report is that we have developed:

- a scheme for describing and analysing school-level practices that may facilitate and optimise teaching and learning, and
- a set of hypotheses for accounting for improved school performance.

In conclusion, we inferred that schools that institutionalised some practices and systems as identified were able to increase and maintain the number of quality passes in mathematics and as such, meeting the objectives of the donors. The factors which appear to hold the most potential for optimising performance in the two high SES former Model C schools are collegial practices on curriculum, pedagogy and assessment. In the two low SES former DET schools performance advantage seems to be enhanced by the systematic use of assessment data and by an increased sense of intrinsic motivation on the part of teachers.

DECLARATION

I hereby declare that this research report is my own unaided work. It is submitted in partial fulfilment for the Degree of Master of Education at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other university.

_____

Edwin Mohlopi Madisha

April 2012

ACKNOWLEDGEMENTS

- I would like to give thanks to the Lord God through whom we receive strength to endure.
- To my supervisor, Dr Nick Taylor – who believed in me and provided continued support.
- I would also like to thank my wife, Zanele for her constant support, understanding and encouragement.
- To my daughters, Refilwe, Malebo and Lebogang – thank you for your patience and assistance.
- I would like to thank the principal and staff of the schools who voluntarily participated in the interviews, thus making possible for me to complete the study.

Contents

Title page i

Abstract ii

Declaration iv

Acknowledgements v

Contents vi

List of Abbreviations viii

1. GENERAL ORIENTATION TO THE STUDY 1
   1.1 Background and context of the study 1
   1.2 Corporate Social Investment in South Africa 2
   1.3 Research problem 3
   1.4 Outline of Chapters 4
2. LITERATURE REVIEW 6
   2.1 Introduction 6
   2.2 Instructional leadership 6
   2.3 Continuing professional development. 10
   2.4 Internal Accountability 15
   2.5 Conclusion 17
3. RESEARCH DESIGN AND METHODOLOGY 18
   3.1 Research Theory 18
   3.2 Research Approach 18
   3.3 Population and Sample 20
   3.4 Data Collection Techniques and Instruments 23
      3.4.1 In-depth Interviews 23
   3.5 Data Analysis 25
      3.5.1 Reliability 27
      3.5.2 Validity 27
      3.5.3 Trustworthiness 28
   3.6 Ethical Issues 29
   3.7 Limitations of the study 30
4. RESEARCH FINDINGS 32
   4.1 Contextual background of schools 32
   4.2 School A1 32
   4.3 School A2 39
   4.4 School B1 45
   4.5 School B2 51

5. ANALYSIS AND INTERPRETATION OF DATA 58
5.1 Instructional Leadership 59
5.1.1 Management of curriculum 59
5.1.2 Curriculum and pedagogy 61
5.2 Continuing Professional Development 63
5.2.1 Networks and collaborations 63
5.2.2 Induction, coaching and mentoring 65
5.2.3 Teachers' sense of responsibility 66
5.3 Internal accountability 68
5.3.1 Efficient use of data 68
5.3.2 Collegial practice on assessment. 70
5.3.3 Moderation of assessment 71
5.4 Conclusion 72
5.4.1 Curriculum and pedagogy 73
5.4.2 Collegial practice on assessment 74
5.4.3 Induction, coaching and mentoring 74
5.4.4 Teachers' sense of responsibility 74
5.4.5 Moderation of assessment 74
6. CONCLUSION 76
6.1 Framing the recommendations. 76
6.2 Instructional Leadership 77
6.2.1 Management of curriculum 77
6.2.2 Curriculum and pedagogy 77
6.3 Continuing professional development 78
6.3.1 Networks and collaborations 78
6.3.2 Induction, coaching and mentoring 78
6.3.3 Teachers' sense of responsibility 79
6.4 Internal Accountability 79
6.4.1 Efficient use of data 79
6.4.2 Collegial practice on assessment 80
6.4.3 Moderation of assessment 80
References 82

LIST OF ABBREVIATIONS

AMESA - Association for Mathematics Education of South Africa

BBBEE - Broad-Based Black Economic Empowerment

CAMI - Computer Aided Mathematics Instructions

CAPS – Curriculum and Assessment policy Statement

CPTD - Continuing Professional Teacher Development

CSI - Corporate Social Investment

DIPIP - data informed practice improvement project

DTI - Department of Trade and Industry

DoE - Department of Education

ELRC – Education Labour Relations Council

E & O – Epoch and Optima

FET – Further Education and Training

HAI - Historically Advantaged Institutions

HDI - Historically Disadvantaged Institutions

HOD – Head of Department

IEB – Independent Examination Board

IPET - Initial Professional Education of Teachers

IQMS - Integrated Quality Management System

NPO - Not-for-Profit organisations

NCS – National Curriculum Statement

NSC - National Senior Certificate

OECD - Organisation for Economic Co-operation and Development

PIRLS - Progress in International Reading Literacy Study

PD - Professional Development

SACE - South African Council for Educators

SACMEQ - Southern and Eastern African Consortium for Monitoring Educational Quality

SIP - School Improvement Plan

SMT – School Management Team

TIMSS - Trends in International Mathematics and Science Study

Chapter One

1. GENERAL ORIENTATION TO THE STUDY

1.1 Background and context of the study

The landscape of the South African Education System in terms of learner performance and outcomes is depressing and this does not augur well for the country's aspirations as a developing state. Learner achievement in South Africa has been low, despite considerable investment in education and numerous policy interventions. However, according to the OECD (Organisation for Economic Co-operation and Development) report (2007), the government should not be discouraged by the lack of correlation between education spending and learning outcomes, as major education investment takes time to deliver results.

In 2002, an evaluation conducted by the Systemic Evaluations Directorate of the Department of Education (DoE) confirmed that achievement levels were low, with Grade 3 learners scoring at 30% for numeracy and 39% for reading comprehension (Kanjee, 2007). In 2004, Grade 6 learners achieved lower averages of 27% for mathematics and 38% for languages. International tests indicate that South African children perform poorly compared to other participating countries. These studies include the Trends in International Mathematics and Science Study (TIMSS), the Progress in International Reading Literacy Study (PIRLS) and the Southern and Eastern African Consortium for Monitoring Educational Quality (SACMEQ).

South Africa participated in the TIMSS tests in 1999 and 2003. Grade 8 learners were tested on mathematics and science proficiency across fifty participating countries. South Africa's performance in both the 1999 and 2003 tests was disappointing, with lower than average scores in both mathematics and science than all other participating countries (including African countries such as Morocco, Tunisia and Botswana) (Howie, 2001). Top performers were Singapore, South Korea, Hong Kong and Taiwan. The 2006 PIRLS results place South Africa at the bottom of 40 participating countries, with a score of 302 (the average score was 500) (Howie et al, 2007) The average South African learner age was 11.9 compared to the assessment age of 10.

In the 2005 SACMEQ tests, South Africa scored ninth out of the fourteen countries in the region (Taylor, 2006). Seychelles, Uganda, Kenya and Tanzania were top performers. It is worth noting that many of the countries that performed better than South Africa spent less on their education system.

Out of 551 940 candidates who wrote the National Senior Certificate (NSC) in 2009, 60.6% passed (DoE, National Senior Certificate Examination Results: 2009). A total of 290 407 candidates wrote mathematics, of this 133 505 (46%) passed and 156 902 (54 %) did not attain the required pass level of 30%. Only 15% of the 290 407 candidates who wrote mathematics obtained 40% and above. It is clear, judging from South Africa's performance in international tests and the NSC examinations, that the country's schooling is not effective in terms of learners' performance and outcomes. Improvement in access to schooling that was achieved recently has left access to quality schooling lagging behind.

1.2 Corporate Social Investment in South Africa

The contribution of South African companies through Corporate Social Investment (CSI) is an endeavour to address some of the concerns outlined above. Such corporate involvement in education is strongly encouraged by government. The regulatory framework of the Department of Trade and Industry (DTI) issued in 2007 regarding Broad-Based Black Economic Empowerment (BBBEE) requires companies to invest 1% of their net profit after tax in the upliftment of communities, 75% of whom need to fall into historically disadvantaged groups (Trialogue, 2010: 13th Edition).

According to Trialogue (2010: 13th Edition), CSI funding in South Africa grew to R5.4 billion in the 2009/2010 financial year compared to R5.1 billion in 2008/09. Education programmes received a big share (32.4%) of the National CSI budget, followed by the health and HIV programmes (16.7%) and social and community development programmes (12.5%) respectively. Other development sectors such as food security and agriculture, environment, enterprise development, training and capacity building, arts and culture, housing and living conditions, safety and security, non-sector specific donations and grants, and sports development share the

remainder of 38.4%. Type of interventions in education include bursaries, scholarships, university chairs; curriculum development/course materials; infrastructure, facilities and equipments; teacher development; additional learner programmes; special needs interventions; and school governance and functionality. Maths, science and technology initiatives receive 30% of the education spend.

The present study investigates the effects of the Epoch and Optima Trusts, which support schools that already deliver quality maths results. Beneficiaries were chosen on the basis that they produced 20 or more black learners passing mathematics HG[1] in 2007 and had to participate in the Maths Challenge competition for selection The Trusts were established in 2007 and receive their funds from the Anglo American Corporation share dividends. Beneficiary schools were allocated on average R300 000 per annum. To date more than R100 million has been spent in over 78 South African public schools with an aim to:

- Increase the number of learners participating in mathematics;
- Increase the number of quality mathematics results (levels 7, 6 and 5[2]); and
- Increase access for disadvantaged learners to quality mathematics teaching.

1.3 Research problem

The Epoch and Optima Trustees did not prescribe to schools how to use the approved grants and relied on the schools' professional discretion to use the money to achieve the Trusts' objectives. The purpose of the present research study is to investigate how two schools which did achieve these goals managed to do this, when compared with two beneficiary schools which did not achieve the goals. The larger goal of the study is to provide lessons concerning the sustainability of benefits derived from such CSI interventions.

The question of sustainability has begun to occupy the minds of CSI practitioners. According to some commentators (Investing in the Future, Mail and Guardian April 2010), most companies

[1] Prior to the curriculum changes of 2008 mathematics was offered at the higher (HG) and standard (SG) grades.

[2] Results are graded as follows: 7 (80-100%), 6 (70-79%), 5 (60-69%), 4 (50-59%), 3 (40-49%), 2 (30-39%), 1 (0-29%).

have traditionally dealt with their CSI obligations by writing cheques to a variety of not-for-profit organisations (NPO's) in what is usually referred to as "*cheque-book relationship*". Michelle Yorke, director of consultancy firm CSI Solutions maintains that there is a move towards sustainability, but while 90% of companies talk about it, most don't understand what it really means (Mail and Guardian: April 2010). Where investment has yielded intended outcomes, the change is usually fragile and not sustainable. Most corporates are becoming disillusioned and frustrated about the amount of money being spent on fragmented projects which do not make a significant and sustained impact. The main research question is: **What activities are principals and teachers in schools supported by the Epoch and Optima Trusts undertaking, which contribute to achieving the aims of the programme?**

This research study therefore, may help schools, especially those supported by Epoch and Optima Trusts to think at depth and implement programmes that will build the school's internal capacity and leave sustainable and long lasting legacies.

1.4 Outline of Chapters

The research report consists of seven chapters. Chapter 1 provides the general background and context of the study. The research problem and the research question were also outlined in this chapter.

Chapter 2 reviews the literature to explore school level practice that could lead to improvement of teaching and learning in schools. Three practices were identified i.e. instructional leadership, continuing professional development and internal accountability, also referred to as 'assessment for learning' in other literature.

Chapter 3 focuses on the research theory and the main question driving the research project. It comprehensively covers debates on case studies in qualitative research and describes research approach, population and sampling, data collection techniques and data analysis. The chapter also provide a framework to guide the collection and analysis of data.

Chapter 4 describes the findings in selected schools in terms of eight indicators spread across three kinds of school practices identified in the literature as being associated with teaching and learning. These indicators include: management of the curriculum; curriculum and pedagogy; networks and collaborations; induction, coaching and mentoring; teachers' sense of responsibility, efficient use of data; collegial practice on assessment and moderation of assessment.

Chapter 5 analyses and interprets the collected data. This is done by comparing the presence and the strength of each indicator in selected school. These comparisons guide the researcher to speculate whether learner performance and achievement improved on grounds that these schools internalised and institutionalised the identified school level practices.

Chapter 6 frames the hypotheses and pulls together a list of recommendations regarding school level activities. These recommendations are informed and develop from the analysis of collected data, coupled with the implications of the ratings for practice in Chapter 5.

Chapter Two

2. LITERATURE REVIEW

2.1 Introduction

The literature review is a search for the activities and systems by means of which schools could achieve the goals of the Epoch and Optima Trusts (hereafter E&O). The research study will investigate only school level activities and not go into classrooms to ascertain the extent to which improved teaching practices were responsible for improved performance. The study assumes that, whatever teaching practices were involved, these were stimulated and facilitated by activities occurring at the school level. After an extensive literature search, the study concluded that any beneficiary schools which do achieve the E&O goals probably do so through some or other combination of the following systems:

Instructional leadership: School leaders initiate and coordinate school level systems which impact on effective classroom practices.
Continuous professional development: In-school professional development activities enable teachers to improve the effectiveness of their teaching.
Accountability: Educators use data collected from different forms of assessment to improve their teaching practice. (Such activities are also referred to in the literature as '**assessment for learning**')

2.2 Instructional leadership

In Chell (2011: 9), instructional leadership encompasses "those actions that a principal takes, or delegates to others, to promote growth in student learning" and comprises the following tasks: defining the purposes of schooling; setting school-wide goals; providing the resources needed for learning to occur; supervising and evaluating teachers; coordinating staff development programmes; and creating collegial relationships with and among teachers (Wildy & Dimmock, 1993: 44). Effective teaching and learning in schools is a collective effort shared amongst relevant stakeholders under the stewardship of the principal. Instructional leadership should best

be understood as distributed practices stretched over the school's social and situational contexts (Spillane: 2006). It becomes imperative for principals to build collaborative cultures that promote a shared sense of purpose.

Sammonds (2004) commends that, first, school leaders improve teaching and learning indirectly and most powerfully through their influence on staff motivation, commitment and working conditions. Secondly, school leadership has a greater influence on teachers and students when it is widely distributed. Distributing leadership to other staff members requires a trusting and collaborative climate, a shared and monitored mission, taking initiatives and risks, and ongoing, relevant professional development (Sammonds, 2004: 28).

Taylor et al (2009: 5) reckon that another important management dimension is the responsibility of the principal and her team to ensure that not only that teachers are in class and teaching during school hours, but also that teachers cover the curriculum effectively when they are in class. Elmore (2008) uses the term 'internal accountability systems' to signal the processes through which schools maintain effective curriculum delivery. These processes include designing school improvement strategies, implementing incentive structures for teachers and support personnel, recruiting and evaluating teachers, brokering professional development consistent with the school improvement strategy, allocating school resources towards instruction and buffering teachers from non-instructional activities.

Concurring with Sammonds, McKinsey & Co. (2007) maintain that principals must focus on instructional leadership and not on school administration. Principals limit their capacity to effect real improvement in student outcomes if they spend most of their time on tasks not directly related to improving instruction. Unfortunately, the daily chores of the school demand principals to document whatever transpires in the school for future reference. This literally implies that principals are inevitably becoming more concerned of the administrative and managerial duties with less focus and emphasis on instructional tasks. Ultimately, the core business of the school may be indirectly undermined and compromised.

Christie et al (2007) concluded that schools that work:

- were focused on their central tasks of teaching and learning with a sense of responsibility, purpose and commitment;
- carried out their tasks with competence and confidence;
- had organisational structures that supported a work ethic, expected achievement and acknowledged success; and
- had strong internal accountability systems in place that enabled them to meet the demands of external accountability, evidenced most particularly in terms of Senior Certificate achievement (Christie et al, 2007: 5)

However, Kruger (2003: 245) maintains that the main responsibility of the principal remains that of ensuring effective teaching and learning irrespective of the dichotomy between managerial and instructional practices, and despite the complexity and volume of the tasks. Under these circumstances it is practically impossible for the principal to individually steer the ship towards the desired destination without drawing expertise from other staff members. Principals and other members of the school management team (SMT) within the school should work interdependently to learn with and from each other so that together they can help the teachers and learners (Williams and Matthews, 2005).

Hopkins and Jackson (2003: 94) articulate the importance and relevance of networks in and across school. They argue that networks bring together those with like-minded interests and they are more than just opportunities to share 'good practices'. Accordingly, networks need to be regarded as social support structures for innovative schools, not only disseminating 'good practice', but also helping schools to share and understand 'good practice' – the capacity of creating processes that lead to 'best practice'. Networks are also important in overcoming the traditional isolation of schools, and to a certain extent, even challenging traditional hierarchical structures. They offer the potential for 'reinventing' the meso-level by promoting different forms of collaboration, linkages and multifunctional partnerships.

Collaboration between staff members within a school is the key to success for all students. It is an essential ingredient in an educational environment that demands nothing less than that every student can and will learn in our classrooms. According to Harvey (2008), the framework for

creating a ‘structured framework” in promoting improved collaboration is premised in the following pillars: creation of a vision statement and strategic plan for educational leaders to engage in a dialogue with other members of the school community; creation of collaboration pods (working teams) based on comfort level and expertise; development of data collection tools to provide informed decisions on student success; development of collaborative learning pods expectations that will allow everyone the freedom to teach and learn collaboratively; implementation of ideas and suggestions in classrooms; and realisation that educational environments differ in demographic make-up (Harding: 2008).

According to Hopkins (2006: 19), “there are four key drivers that if pursued relentlessly and deeply have the possibility to deliver ‘every school a great school’. These are personalising learning, professionalised teaching, networks and collaboration, and intelligent accountability”. Hopkins concludes that networks support improvement and innovation by enabling schools to collaborate on building curriculum diversity, extended services and professional support. They also develop a vision of education that is shared and owned well beyond individual school gates.

Pont, Nusche and Hopkins (2008: 51) provide a compelling argument for distributed leadership. They articulate that the literature on communities of practice suggests that collective learning requires distributed cognition. As networks or organisations get better at what they do, specialised expertise tends to develop in multiple sites; networks of influence develop around those sites; and leadership tends to become defined less by position and more by expertise. In fact, there are situations in which the development of practice relies more on social networks, and less on formal organisation.

Principals by virtue of their position have a central role to play in the development of teachers at schools. Unfortunately, principals are unclear about what teacher development really is, what their role in teacher development is, and what actions they should implement. According to ELRC (2009), teacher development does not feature as a central core of the principal’s set of responsibilities in leading teaching and learning. Most principals do not regard themselves as being directly responsible for teaching and learning. Those principals who do acknowledge their

responsibility in instructional leadership and in fostering teacher development often claim that it is not a function they feel competent to perform (ELRC, 2009: 36).

On a cautionary note, Hoadley, Christie and Ward (2008) note that empirical studies on the effect of leadership on student achievement show that effects are small and indirect. However, there is some consensus in the literature that leadership has an indirect effect on student outcomes through its direct effect on instructional organisation and culture (Hoadley et al, 2008: 145). In their empirical study on curriculum management conducted in 142 secondary schools in the Eastern and Western Cape, Hoadley, Christie and Ward found that principals reported spending most of their time on administrative functions and disciplining learners. 'Instructional leadership' as read through overseeing teaching and curriculum and supervising teachers, was not a function that took up the majority of many principals' time. The second aspect was that the management of curriculum and instruction was dispersed across the school. The majority of principals stated that it was the responsibility of senior managers to ensure curriculum coverage in schools.

Literature on instructional leadership foregrounds the management of curriculum as central towards improving learner performance and achievement. Effective management of the curriculum is not insulated from classroom practices and issues of pedagogy. While it is commendable that teachers cover and complete the syllabus on time, it would be useless if learners are left behind with huge cumulative knowledge gaps. As such management of the curriculum should be addressed concurrently with issues of pedagogy.

2.3 Continuing professional development.

According to the National policy Framework for Teacher Education and Development in South Africa (2007), the new Continuing Professional Teacher Development System will:

- ensure that current initiatives devoted to the professional development of teachers contribute more effectively and directly to the improvement of the quality of teaching;
- emphasise and reinforce the status of teaching;
- provide teachers with clear guidance about which Professional Development (PD) activities will contribute to their professional growth;

- protect teachers from fraudulent providers; and
- expand the range of activities that contribute to the professional development of teachers.

In the new system, the South African Council for Educators (SACE), as the statutory body for professional educators, will have overall responsibility for the implementation, management and quality assurance of the CPTD system. SACE will be provided with the necessary resources and support to undertake that role. The PD point method is an internationally recognised technique used by professional bodies in many fields to acknowledge their members' continuing professional development. Each teacher will be expected to earn a targeted number of PD points in each successive three-year cycle by undertaking a variety of professional development activities endorsed by SACE on grounds of their fitness of purpose and quality, that suit their own needs and requirements or that have been required by their employers.

The first declaration adopted at the Teacher Development Summit (DoE, Teacher Development Summit: 2009) notes that South African teachers come with different historical qualifications and educational backgrounds, the majority of which were developed under apartheid structures that deliberately disadvantaged and underdeveloped large sections of the population. This has resulted in major differences in the development needs across the system, particularly with respect to confidence and competence in dealing with the National Curriculum Statement and changes in education. In the Report of the President's Education Initiative Research Report, Taylor and Vinjevold (1999: 139) note teachers' low levels of conceptual knowledge, their poor grasp of their subjects and the range of errors made in the content and concepts presented in their lessons. Classroom practice still tends to be dominated by teacher talk with low levels of learner participation; rote learning; lack of meaningful questioning; lessons having a lack of structure and an absence of engaging activities; little group work or meaningful interaction between learners; and relatively few tasks requiring reading/writing.

Little (1990) argues that teaching has traditionally been a very isolating profession and that "norms of collegiality" in a school setting are, in reality, quite rare. The nature of the work of teaching makes conversation among professionals difficult. Conversations are mostly informal and disjointed, and sometimes more negative than helpful. The induction and mentoring of new

teachers in schools has been proposed as a way of dealing with these obstacles to collegiality among teachers. Odell and Huling (2000, p.xv) describe mentoring as a professional practice that occurs in the context of teaching whenever an experienced teacher supports, challenges, and guides novice teachers in their teaching practice.

According to Bartell (2005: 11), teaching is becoming more collegial, drawing on the teacher's own instincts and motivation to work in a collaborative environment. Teachers are no longer working in isolation and autonomously behind their classroom door. Embracing inter-classroom partnerships and team teaching can assist teachers to deal subject content deficiencies and allows experienced teachers to model pedagogic content knowledge to their peers and new graduates. She concludes that the new model of teaching requires that teachers work together to address the learning of students, learn from one another, and solve problems together. It requires that the experienced play a role in nurturing and developing the teachers of the future.

The power of collaboration is illustrated by Raudenbush's reflection on MaPing Li's study of elementary mathematics instruction in China (2009: 175). Participating teachers in the study did not have four-year college degrees, but they had a good working knowledge of the mathematics they needed to teach and somewhat beyond. They had a common curriculum, common assessments, and common instructional strategies – a shared, systematic instructional system. They collaborated closely, sharing knowledge, expertise and teaching plans. They tested their students frequently and generated common strategies to overcome student misconceptions and to drive instruction to the next level. Their students displayed uniformly high levels of achievement.

Current literature advocates professional learning communities as integral component of school improvement. In Hargreaves (2003: 185), different authors advance motivations on professional learning communities. Professional learning communities in schools emphasise three key components: collaborative work and discussion among the school's professionals; a strong and consistent focus on teaching and learning within that collaborative work; and gathering assessment and other data to inquire into and evaluate progress and problems over time (Newmann and Wehlage: 1995, King and Newmann: 2001). Professional learning communities

are claimed to lead to strong and measurable improvements in students learning (Newmann and Wehlage: 1995, Little: 2001). Instead of bringing about 'quick fixes' of superficial change, they create and support sustainable improvements that last over time, because they build the professional skill and capacity to keep the school moving (Stoll: 1999, King and Newmann: 1999).

The ultimate outcome of professional development of teachers is personalised learning. However, Moss (2011) warns that professional development for teachers is a steep hill. Teachers are overwhelmed and tired with little time to participate in lengthy seminars.

McKinsey & Co. (2007) contend that "the only way to improve learning outcomes is to improve instruction". They argue that learning occurs when students and teachers interact, and thus to improve learning implies improving the quality of that interaction. Coaching classroom practice, moving teacher training to the classroom, developing stronger school leaders and enabling teachers to learn from each other have been identified as effective interventions to achieve quality interactions. Individual teachers need to become aware of specific weaknesses in their own practice, need to gain understanding of specific best practice and need to become motivated to make the necessary improvements.

Giving account of her lifelong teaching and learning Linda Hodges in Stone (2006: 23) presents that she realised that the knowledge acquired during her college years was just a beginning. After 40 years as a lead teacher, she fostered professional growth among teachers in several ways including:

- Sharing expertise with teachers in her department and other departments in her school. This involved making computers and other technological instructional tools available to teachers and providing proper training for their use;
- Presenting workshops for teachers in other schools in her district;
- Conducting science workshops for elementary school teachers attending education conferences;
- Inviting elementary, middle, and high school teachers to Saturday science workshops;

- Working with teachers from high schools and elementary schools to articulate the curricular needs at all grade levels in an effort to improve the entire science curriculum; and
- Coordinating meetings of all science teachers from her district science schools.

Hargreaves and Fullan (1992) identify three approaches to teacher development i.e. acquiring the knowledge and skills of effective teaching, developing personal qualities, commitment and self-understanding, and creating work environment supportive of professional learning and continuous improvement. Teacher development as self understanding embraces the concept of personal development, which directly affects one's beliefs and behaviour. Adult development is likely to be successful when it is voluntary rather than being coercive. Teachers should be seen as active, knowledgeable and ready to learn rather than passive, deficient and resistant. They should take charge of their own professional development as communities of thoughtful and reflective practitioners. A limited view on teachers as people to be trained and developed has to be abandoned and we have to view teachers as people who can and should develop themselves.

Communities of practice are about bringing teachers who are bound by common interest together for knowledge sharing. Bartell (2005) maintains that the new model of teaching requires that teachers work together to address the learning of students, learn from one another, and solve problems together. Organising mentoring into structured induction programmes helps to deal with challenges and threats to the natural collegiality among teachers (Little: 1990). Coaching classroom practice, moving teacher training to the classroom, developing stronger school leaders and enabling teachers to learn from each other have been identified as effective interventions to achieve quality interactions, according to McKinsey & Co. (2007).

The literature on continuing professional development provided us with three basic set of indicators i.e. networks and collaborations; induction, coaching and mentoring; and teachers' sense of responsibility. Teachers participate in clusters and other professional bodies such as AMESA to share knowledge and wisdom with their counterparts. These interactions are healthy for the development and advancement of the teaching profession.

2.4 Internal Accountability

According to Darling-Hammond (1989: 61), there are three main types of accountability systems in the field of education:
(a) Compliance with regulations, where educators are accountable for adherence to rules and accountable to bureaucracy (Administrative/Bureaucratic accountability);
(b) Adherence to professional norms, where educators are accountable for adherence to standards, and accountable to their peers (Professional accountability), and
(c) Results-driven where educators are accountable for student learning, and accountable to the school stakeholders (combination of administrative and professional accountability).

The Report to the Minister of Education about Schools that Work (Christie et al, 2007), identified strong internal accountability systems in good performing schools, which were aligned with the demands of external accountability. Elmore (2004:127) differentiates schools with strong and weak accountability structures as follows:

> Schools with weak internal accountability structures assign causality for their success or failure to forces outside their control: the learners, their families, the community, the "system". Schools with strong internal accountability assign causality for their success or failure to themselves: to the knowledge and skill they bring to their work, to the power of shared values, and to the capacities of their organisations.

Issues of accountability, either internal or external start to emerge as a significant variable to improve learner performance. In the United States, there is general consensus that schools should be held more accountable to standards for student performance (Johnson & Immerwahr, 1994). Elmore shows that the aggregate effect of accountability policies on individual students seems to be generally positive, in terms of student's performance and retention in school (Elmore, 2003: 207).

Elmore (2008) argues that 'real' professions develop relatively clear standards of practice to guide their detailed daily decisions and monitor the consistency of their practice with those standards relatively carefully. This implies that educators need to focus on formative assessment to identify and diagnose learners' weaknesses and misconceptions. Formative assessment data

should be very close to the instructional process and monitor the quality of instruction against some external standard of practice. According to Raudenbush (2009: 176), the instructional system should meticulously uncover and correct children's misconceptions. As a result, a highly systematic and explicit approach to instruction is required, one that uses frequent assessments of student misconceptions followed by correct, targeted feedback. At a more advanced level, teachers should deeply master the developmental theory behind the assessments so that they can skilfully assess and instruct moment by moment.

Feedback is defined as imparting directly a judgement of a child, a child's strategies and skills or child's attainment (often in relation to goals) and giving information about the judgement (Sammons, 2004: 30). Feedback can be evaluative or descriptive and both are important in the learning process. Evaluative feedback from the teacher to the child suggests ways for improving outcomes. The feedback is also important to the teacher, not only to design intervention mechanisms, but to reflect on his/her teaching practice. In a collaborative situation, the teacher may summon the services of the expert or instructional leader to work closely with him. This means that the result of every child is open to scrutiny and teachers will be motivated to promote high levels of learner achievement.

There is a growing anti-standardisation argument that calls for a shift from data-driven decision making models to creative models of assessments (Hargreaves & Shirley: 2007). Referring to the report of the New Commission on the Skills of the American Workforce, which argues that most high-stakes tests do not promote "creativity and innovation" or "facility with the use of ideas and abstractions", Hargreaves and Shirley advocate what they call a new age of post-standardisation . By comparing the US and Finland, which beats the rest of the world in the maths, science and reading abilities of their 15-year olds on international tests, the two researchers highlight that the Finns promote a broad and enriching curriculum, rather than obsessing only about literacy and maths. The Finns raise standards by lifting the many, rather than pushing a privileged few, and they morally inspire rather than financially incentivise a high status profession. Their post-standardisation theory pays more attention to developing teacher's capacity to meet higher standards, rather than emphasising the paper standards themselves. Assessment for summative

quality assurance is replaced by assessment for learning, where data are used to inform ongoing decisions to produce better outcomes.

The management of data collated from all forms of assessment is crucial for the school to gauge its performance as far as learner achievement is concerned. Hence it is important for school to effectively use the collated data in order to design strategies to help underperforming learners. Three indicators remain central in ensuring that schools use the collected data to improve instruction, i.e. efficient use of data, collegial practice on assessment and moderation of assessment. These indicators will be thrashed in the coming chapters to see how they relate to learner achievement.

2.5 Conclusion

The literature reviewed in this chapter leads us to expect three sets of school level practices to be involved in improving teaching and learning in schools:

- Instructional leadership: Management of curriculum and curriculum and pedagogy;
- Continuing professional development: Networks and collaborations; induction, coaching and mentoring and teachers' sense of responsibility; and
- Internal accountability: Efficient use of data; collegial practice on assessment; and moderation of assessment.

In Chapter 3 we further disaggregate these three kinds of activities into 8 indicators of school level practices likely to enhance teaching and learning. These eight indicators were used to structure our empirical investigation reported in Chapters 4 and 5. But first we turn to matters of research design and method.

CHAPTER THREE

3. RESEARCH DESIGN AND METHODOLOGY

3.1 Research Theory

Schools which participate in the Epoch and Optima programme were selected because of their excellent Grade 12 Mathematics results. As discussed in Chapter 1, the main question driving the present research project is: What activities are principals and teachers in schools supported by the Epoch and Optima Trusts undertaking, which contribute to achieving the aims of the programme?

As argued in Chapter 2, the literature is inclined to the view that what happens in classrooms depends on school level instructional leadership practices, professional development of teachers and the maintenance of internal accountability measures. Based on these conclusions, we disaggregated the principal research question into three subsidiary questions, in order to understand how some schools used the additional funds to improve and sustain the quality of mathematics results, and why the quality of mathematics results declined in other schools despite the increased funding.

- What instructional leadership practices do school leaders establish and maintain in order to support teaching and learning in classrooms?
- What professional development activities are teachers in schools supported by the Epoch and Epoch Trusts undertaking?
- How do educators use data collected from different forms of assessment to improve their teaching practice?

3.2 Research Approach

This study is premised within the qualitative research design. Qualitative research, broadly defined, means “any kind or research that produces findings not arrived at by means of statistical procedures or other means of quantification” (Strauss & Corbin, 1990).

Case Study methodology as a research design is more relevant in exploring teacher practices in schools when the purpose is to understand behavioural detail and impact mechanisms. Different authors give different descriptions of what a case study is. Cohen and Manion (1989: 124) describe a case study in this way, "unlike the experimenter who manipulates variables to determine their causal significance or the surveyor who asks standardised questions of large, representative samples of individuals, the case study researcher typically observes the characteristics of an individual unit – a child, a clique, a class, a school or a community".

In the educational case study, researchers are concerned neither with social theory nor with evaluative judgement, but rather with the understanding of educational action (Stenhouse, 1985: 50). He mentions that researchers are concerned to enrich the thinking and discourse of educators either by the development of the educational theory or by refinement of prudence through the reflective documentation of evidence".

Qualitative research in general and case study designs in particular are generally associated with inductive methods, but a number of authors point to the interplay of induction and deduction in such research. According to Creswell, qualitative research begins with assumptions, a worldview, the possible use of a theoretical lens, and the study of research problems inquiring into the meaning individuals or groups ascribe to a social or human problem. To study this problem, qualitative researchers use an emerging open-ended approach to inquiry, the collection of data in a natural setting sensitive to the people and places under study, and data analysis that is broadly inductive and establishes patterns or themes. The final report includes the voices of participants, the reflectivity of the researcher, and a complex description and interpretation of the problem (2007: 37)

Gilgun (2011:1) notes that many researchers have theories they think will help them to focus their research questions. These theories can be based on combinations of preliminary studies, reviews of research and theory, professional experience and personal experience. What she calls deductive qualitative analysis is responsive to these issues, while maintaining procedures that allow for the identification of new dimensions of social phenomena and the concepts and theories that compose them. This is the approach adopted by the present study, where we start by

looking for the nine kinds of school level activities identified in the literature as being associated with effective teaching and learning. At the same time, we remained open to the identification of additional factors which may be associated with good performance in our case study schools.

Yin (1994: 9) recognised that within the academic community there is opposition to the idea of case study designs on the grounds of a 'lack of rigor' and little basis for scientific generalisation'. Contrary to this criticism, Flyvbjerg (2006: 227) asserts that "a purely descriptive, phenomenological case study without any attempt to generalise can certainly be of value in this process and has often helped cut a path towards scientific innovation. Formal generalisation is only one of many ways by which people gain and accumulate knowledge".

Myers (2002) notes that a degree of subjectivity is inevitable in undertaking qualitative research studies: In qualitative studies, researchers maintain their humanity throughout the research process which makes it largely impossible to escape the subjective experience, even for the most seasoned of researchers. Speaking about the world of human experience requires an extensive commitment in terms of time and dedication to process; however, this world is often dismissed as 'subjective' and regarded with suspicion.

Contrary to this critique of qualitative studies, Campbell (1975), Ragin (1992), Geertz (1995), Wieviorka (1992), Flyvbjerg (1998, 2001) and other researchers who have conducted intensive, in-depth case studies reported that their preconceived views, assumptions, concepts and hypotheses were wrong and that the case material has compelled them to revise their hypotheses on essential points (Flyvbjerg, 2006: 235). Flyvbjerg (2006: 237) concludes that "the case study contains no greater bias towards verification of the researcher's preconceived notions than other methods of inquiry. On the contrary, experience indicates that the case study contains a greater bias towards falsification of preconceived notions than towards verification".

3.3 Population and Sample

A matched pairs sampling technique was used to select four schools from a population of 78 public schools which were continually supported by the Trusts over a period of two years. Matched sampling is a method for selecting units from a larger reservoir of potential controls to

produce a control group of modest size that is similar to a treated group with respect to the distribution of observed covariates (Rosenbaum & Rubin, 1985).

One pair is classified as Historically Advantaged Institutions (HAI), referring to two former Model C[3] schools, while the other pair is classified as Historically Disadvantaged Institutions (HDI), referring to two former Department of Education and Training[4] schools. One HAI school is high performing and one low performing, and one HDI is high performing and one low performing. For the purpose of this research, former Indian and Coloured schools were classified as HDI. These public schools were selected from Limpopo, Mpumalanga and Gauteng provinces on the basis of their performance and the degree to which they achieve the Epoch and Optima Trusts' objectives, specifically, on improving the quality of mathematics results. A table below is a summary showing the number of schools, broken down by former education departments (HAI and HDI) and by performance (high and low).

	HAI	HDI	Total
High	31	16	47
Low	12	19	31
Total	43	35	**78**

The schools were selected purposefully according to mean performance in mathematics over a period of two years and each school was classified either as high or low performing, based on the 2009 and 2010 National Senior Certificate mathematics results. Where more than 55% of learners achieved at levels 4, 5, 6 and 7[5], the school was classified as high performing. In a low performing school, less than 55% of learners achieved at levels 4, 5, 6 and 7.

[3] Reserved for whites prior to 1994.

[4] Schools for African learners living in areas reserved for whites.

[5] See Chapter 2, footnote 2 for a definition of these categories.

School A1, Gauteng province, urban

Year	Number of learners		
	Levels 1-3	Levels 4-7	Total
2009	14	160	**174**
2010	31	119	**150**
Total	**45**	**279**	**324**

School A2, Mpumulanga province, urban

Year	Number of learners		
	Levels 1-3	Levels 4-7	Total
2009	75	53	**128**
2010	80	56	**136**
Total	**155**	**109**	**264**

School B1 Limpopo, rural

Year	Number of learners		
	Levels 1-3	Levels 4-7	Total
2009	86	153	**239**
2010	73	125	**198**
Total	**159**	**278**	**437**

School B2 Limpopo, rural

Year	Number of learners		
	Levels 1-3	Levels 4-7	Total
2009	47	13	**60**
2010	65	15	**80**
Total	**112**	**28**	**140**

It would have been preferable to have similar numbers in each pair, unfortunately, this was difficult to achieve. In fact it was difficult to find two schools in each pair which were similar in socio-economic status, former department of education and cultural context, but differing levels of performance.

3.4 Data Collection Techniques and Instruments

Background information from the schools was gathered on the composition of the maths department, teachers' qualifications and their experience in maths teaching and funds received from the Trusts. In order to investigate the school level practices identified in Chapter 2, interviews were conducted with the school principal, maths Head of Department (HoD), senior maths teacher and junior maths teacher.

Funds disbursed by the Epoch and Optima Trusts were directed towards improving the quality of maths results in supported schools. On average, each school received R900 000 over a period of three years (R300 000 annually). School A1 used more than 80% of the grant to pay the salary of an additional teacher, School A2 used 100% of the grant to buy electronic gadgets such as the interactive whiteboards, School B1 used more than 80% of the grant to pay teachers for conducting supplementary lessons over weekends and during school holidays and lastly, School B2 used more that 80% of the grant to pay salaries of two additional teachers. However, our interest was on how these schools internalised the identified school level practices and not on how they appropriated their grants.

The maths department, together with the principal are directly responsible for learner outcomes and performance in mathematics. It is then the prerogative of the maths department to decide how to use funds prudently in order to achieve the objectives of the Trusts. Principals have the financial responsibility over the grants invested to benefit the maths department and are accountable to all relevant stakeholders, including the Department of Education and parents.

3.4.1 In-depth Interviews

The research interview is defined as "a two-person conversation initiated by the interviewer for the specific purpose of obtaining research relevant information, and focused by him on content specified by research objectives of systematic description, prediction or explanation" (Cannell and Khan, 1968: 527). It involves the gathering of data through direct verbal interaction between individuals. For the purpose of this study, in-depth interviews were used as principal instruments of gathering data. Qualitative in-depth interviews are noted more for their probes and pauses than

for their particular question formats. Establishing trust, being genuine, maintaining eye contact, and conveying through phrasing, cadence and voice tone that the researcher hears and connects with the person elicit more valid data than a rigid approach (McMillan and Schumacher, 2010: 357).

The interviews were structured in that the exact wording and sequence of questions were determined in advance. All interviewees were asked the same basic questions in the same order. Notwithstanding the fact that these interviews reduce interviewer flexibility and constrain naturalness and relevancy of the response (McMillan and Schumacher, 2010: 355), their strength is in reducing the effects and bias of the researcher.

On the other hand, the interviews were open-ended in that interviewees were not asked to choose between a set of pre-determined answers, but to answer in their own words. I was persuaded by Cohen and Manion's arguments for open-ended questions in the paragraph below:

> Open-ended questions are very attractive devices for smaller scale research or for those sections of the questionnaire that invite an honest, personal comment from the respondents. It is the open-ended responses that might contain the 'gems' of information that otherwise might not have been caught in the questionnaire. Furthermore, open-ended questions put the responsibility for and ownership of the data more firmly into the respondents' hands. Open-ended questions can catch the authenticity, richness, depth of the response, honesty and candour, which are the hallmarks of qualitative data (2000: 255).

Inherently, questions intrude into the life of the respondents in terms of time taken to answer, the level of threat or sensitivity of the questions, or the possible invasion of privacy. Cohen and Manion advise researchers to avoid asking ambiguous and complex questions that may irritate participants. When framing questions in the interview schedule, I used questions that keep the dialogue without harming the relationship between the researcher and participants. Lim and Odom (2009) propose that researchers should appropriately frame questions that explore "contextualised activities" in experience-centred design process. They refer to contextualised activities as questions probing people's activities in relation to where, when and which situation they are happening. Questions asked to teachers and principals from the interview schedule focused primarily on what happens within schools as opposed to external factors that support the school systems.

3.5 Data Analysis

To analyse the collected data, I primarily used a deductive thematic approach. The indicators used in the coding scheme were extracted from the literature and questions asked in the interview schedule were structured around these indicators. Patton (2002) argues that qualitative content analysis does not need to exclude deductive reasoning. According to Miles and Huberman, this approach has the advantage of supporting the accumulation and comparison of research findings across multiple studies (1994: 4). Even though the deductive thematic analysis was the primary approach, I remained open to the emergence of new ideas during the collection and analysis of data and to this extent introduced an inductive element to the study.

Table 1 shows the framework used to guide the collection and analysis of data. The framework commences with the three categories of school level practices, disaggregated into eight specific activities derived in Chapter 2. A set of indicators was then formulated to assess the degree to which each of the specific practices was present in schools. Collective responses of the four interviewees at each school were rated, first, according to the reliability of the information supplied by participants.

If they were unanimous in their views then the evidence on that particular activity was considered reliable; if they contradicted each other, the evidence was unreliable, and this was taken to mean that the practice did not occur in the school, or occurred in a weak manner (rating: 1). Second, reliable evidence was then used to determine the strength of the particular practice in question. The strength was rated 3 if there was strong evidence for the existence of the practice, 2 if there was some evidence for the existence of this practice, and 1 if there was little or no evidence of the practice existing in the school.

Table 1: School practices and indicators

1. Instructional leadership: school focuses on the management of teaching and learning.	
1.1. **Management of curriculum**: There is evidence that the school has systems	Strong systems for planning and monitoring curriculum delivery: **3**

to ensure effective management of curriculum.	Some evidence of systems and inconsistent monitoring:**2** Absence of curriculum management systems: **1**
1.2. **Curriculum and pedagogy**: Planned and regular meetings to discuss and give feedback on instructional practice among staff members.	Regular discussions across phases and within grades on teaching and learning every term: **3** Some structured discussions once a year: **2** No discussions or may happen informally: **1**

2. **Continuing professional development**: school has a programme that supports professional teacher development, aligned with the needs of the school and those of individual teachers.	
2.1. **Networks and collaborations:** There is evidence that subject teachers participate in clusters and networks in the school.	Strong evidence of subject teachers collaborating and networking with other teachers in the school: **3** Some evidence of collaborations and networks: **2** No evidence of networks/collaborations with other teachers: **1**
2.2. **Induction, coaching and mentoring**: School has an effective induction programme for newly qualified teachers and provide supportive mentors and coaching sessions.	Unanimity among interviewees on all three activities and there is supporting evidence: **3** Agreement on some activities with corresponding evidence: **2** No evidence for these activities: **1**
2.3. **Teachers' sense of responsibility**: Teachers proactively take responsibility for their own learning and professional development activities engage teachers as learners.	Unanimity that all teachers take responsibility for their own learning and there is supporting evidence: **3** Some teachers agree but the evidence does not suffice: **2** Teachers are waiting to be trained and for external support and intervention: **1**

3. **Internal accountability**: school has a planned internal assessment programme that supports curriculum coverage and tracks performance.	
3.1. **Efficient use of data**: individual teachers use data from all forms of assessment to inform and improve teaching and learning.	Strong evidence of comprehensive feedback sessions and remediation programmes: **3** Some evidence of feedback without remediation: **2** Assessment is done for policy compliance: **1**
3.2. **Collegial practice on assessment**: Regular structured sessions to discuss learner achievement and performance and to evaluate levels of achievement	Regular discussions across phases and within grades focusing on assessment every term: **3** Some structured discussions on assessment once a year: **2** No systems and discussions on assessment may happen

against expected outcomes.	informally: **1**
3.3. **Moderation of assessment**: The HoD moderates and gives feedback on all forms of formal assessment	Strong evidence that all forms of formal assessment are moderated: **3** Some evidence that all forms of formal assessment are moderated: **2** No evidence of moderation by the HoD: **1**

1: No evidence of the practice existing in the school. 2: Some evidence for the existence of this practice. 3: Strong evidence for the existence of the practice.

3.5.1 Reliability

Reliability is about consistency of measurement. Denzin and Lincoln (1994) provide three criteria for assessing reliability:

Stability of observation – whether the researcher would have made the same observation and interpretation if they had been observed at a different time or in a different place.

Parallel forms – Whether the researcher would have made the same observation and interpretations of what had been seen if he had paid attention to other phenomena during observation.

Inter-rater reliability – whether another observer with the same theoretical framework and observing the same phenomena would have interpreted them in the same way. Even when a single interviewer undertakes all the data collection, his mood and approach can vary from one day to the next.

The structured nature of the data collecting instruments was aimed to maintain consistency, making sure that the researcher would get the same result if he/she or two different fieldworkers had to return to the same school to collect data on two different occasions.

3.5.2 Validity

Validity in qualitative research refers to the degree of congruence between the explanations of the phenomena and the realities of the world. Validity addresses these questions: Do researchers actually observe what they think they see? Do inquirers actually hear the meanings that they

think they hear? (McMillan and Schumacher, 2010: 330). To enhance validity in my research study, in-depth interviews were conducted in natural settings to reflect lived experience. Secondly, to permit triangulation of data across inquiry techniques and increase the credibility of findings, the same questions were put to the principal, HoD, maths senior teacher and maths junior teachers (see appendix A – D: Interview Schedule). Getting similar or divergent responses from same questions asked across all participants assisted me to confirm whether the practices described by one or more of the participants reflect the actual situation.

3.5.3 Trustworthiness

According to Shenton (2004), trustworthiness in qualitative research is introduced because concepts of validity and reliability cannot be addressed in the same way as in quantitative work. Using Guba's constructs, Shenton stresses four criteria that should be considered by qualitative researchers in pursuit of a trustworthy study namely:

(a) Credibility: ensuring that the study measures or tests what is actually intended;
(b) Transferability: extent to which the findings of one study can be applied to other situations;
(c) Dependability: technique to show that, if the work were repeated in the same context, with the same methods and with the same participants, similar results would be obtained; and
(d) Confirmability: steps to ensure that the work's findings are the result of the experiences and ideas of the informants, rather than the characteristics and preferences of the researcher.

While this study attempted to address these criteria in general, particular attention was focused on credibility and confirmability. In addressing credibility, the following provisions were adopted:

- Adoption of research methods well established both in qualitative investigation in general and information science in particular. This was done by showing how the indicators of school practices were derived from the literature, how themes were organised and coded

from the identified school practices, development of the indicators and interview schedule from the themes.

- Triangulation: information across participants (principal, HOD, senior maths teacher and junior maths teacher) was verified to construct a rich picture of attitudes, needs or behaviour based on the contributions of a range of people.
- Tactics to help ensure honesty in informants. The participation information sheet that explicated two critical declarations: voluntary participation and the right to withdraw from the study at any point.

3.6 Ethical Issues

The requisite procedures laid down by the university were complied with in all respects. In addition, great care was exercised during data collection at the schools.

The researcher, in realising that most educational research studies deal with human beings, endeavoured to protect the rights and welfare of participants. The research question always remained secondary to the well-being of research participants and in no way was their well-being undermined or subordinated. The researcher consciously avoided circumstances that perpetrated abuse or made mistakes of real consequences with people to interact with. Guided by the principles published by the American Educational Research Association and the American Psychological Association (McMillan and Schumacher: 2010), the following principles and guidelines were adhered to:

Full disclosure or deception: the researcher was open and honest with the participants about all aspects of the study. Attempts to deliberately mislead participants were avoided and the purpose of the research study was explicitly disclosed.

Voluntary participation: it was not the intention of the researcher to compel or coerce to ensure maximum participation. The researcher ensured that participation was always voluntary, and even the most subtle ways of coercion were avoided.

Informed consent: consent was obtained by asking participants to sign a form that indicated understanding of the research and consent to participate. The ethical rights of participants to make their own decisions about participation were respected.

No harm or risk to participants: educational research studies are likely to have some degree of risk; however, it was not the intention of the research study to cause physical or mental discomfort, harm or injury to the participants.

Privacy: the researcher protected the privacy of participants through:

(i). Anonymity – the researcher did not identify the participants or the schools from information that was gathered;

(ii). Confidentiality – no individual, except the researcher will have access to the participants data or names; and

(iii). Appropriate storage of data – no individual, except the researcher will access paper copies of responses and electronic forms of data.

3.7 Limitations of the study

It was mentioned earlier that data was primarily collected by using in-depth interviews because they provide much more detailed information than what is available through other data collection methods such as surveys. In-depth interviews are also characterised by synchronous communication (Opdenakker: 2006), they allow more spontaneous answers from interviewee, without an extended reflection. However, this does not mean that this data collection instrument is without limitations. A succinct limitation of this instrument is provided by Patton in Shenton (2004), when he associates objectivity in science with the use of instruments that are not dependent on human skill and perception. He recognises the difficulty of real objectivity, since as even tests and questionnaires are designed by humans, the intrusion of the researcher's biases is inevitable.

Secondly, I was involved in the approval and management of Epoch and Optima grants. Participation of informants in the study might have been driven by their perceived relationship we previously had with the Trusts irrespective of our independence, resulting in a willingness on the part of participants to portray their school in as favourable a light as possible. As a strategy to deal with the latter, we declared in advance that we were no longer working for the Epoch and Optima Trusts even though the study might provide valuable information to the Trustees. To address the former limitation, efforts were made to design data collection techniques and to conduct interviews in a manner that would allow for minimal bias. Of critical importance, were

the awareness of our preconceived notions during data collection processes to counter check our subjective and arbitrary beliefs. This was done by focusing and concentrating on the questions asked and answers given by using an interview schedule.

CHAPTER FOUR

4. RESEARCH FINDINGS

4.1 Contextual background of schools

A total of four schools were visited, two in Limpopo province, one in Mpumalanga province and one in Gauteng province. The two schools in Limpopo are former homeland schools in rural areas, serving learners from low income groups. Both schools in Mpumalanga and Gauteng provinces served learners from middle to high income groups. For ethical considerations, in order to protect the identities of the participants, these four schools were labelled as school A1, school A2, school B1 and school B2. Participants were identified by their titles (principal, maths HoD, maths senior teacher and maths junior teacher). All three identified school effectiveness features or school practices (instructional leadership, continuing professional development and internal accountability) were explored in each school.

As mentioned earlier in chapter 3, the collective responses of the four interviewees at each school were rated, first, according to the reliability of the information supplied by participants. If they were unanimous in their views then the evidence on that particular activity was considered reliable; if they contradicted each other, the evidence was unreliable, and this was taken to mean that the practice did not occur in the school, or occurred in a weak manner (rating: 1). Second, reliable evidence was then used to determine the strength of the particular practice in question. The strength was rated 3 if there was strong evidence for the existence of the practice, 2 if there was some evidence for the existence of this practice, and 1 if there was little or no evidence of the practice existing in the school.

4.2 School A1

School A1 is a high school (ex-model C) situated in one of the suburbs of Johannesburg in Gauteng province. The school serves learners of the middle to high income classes, most of whom could afford fees. In 2011, parents paid R20 216 in school fees. All participants, teachers and school leaders were highly qualified with bachelor and postgraduate degrees appropriate to

the subject they taught i.e. mathematics. The HoD had 13 years experience of maths teaching and the senior maths teacher had six years of maths teaching.

Instructional leadership

School focuses on the management of teaching and learning.

While the HoD considered herself together with the principal as instructional leaders, all participants regard the principal to be the instructional leader. They acknowledged that the principal should be concerned that effective teaching and learning takes place in classrooms and should ensure that teachers know the extent of the curriculum. According to the principal, instructional leadership is about "creating the vision, inspiring, developing people, leading the curriculum delivery, quality assurance, networking, policy direction, advising education authorities on the realities".

1.1. Management of curriculum: **Rating 3**

There is evidence that the school has systems to ensure effective management of curriculum.

All participants stressed that curriculum was effectively managed and the HoD mentioned she had 52 lesson meetings planned for the year. In these meetings, all mathematics educators identified content delivery challenges and discussed how each educator was coping with these challenges. The principal stressed that the school strove to acquaint itself with the recent curriculum developments, appointed experts in subjects, and developed subject teachers' content and pedagogical content knowledge.

Effective management of the curriculum as articulated by participants implied seamless distribution of authority to various departments within the school. Each level of the management hierarchy i.e. principal, deputy principal and the HoDs, exactly knew its responsibilities, characterised by effective channels of communication across these levels. Given their autonomy, each department allocated work load across the grades according to the experience and expertise of subject teacher. The principal coordinated all departments and remained accountable to all responsibilities distributed and delegated.

Departments had strategic plans outlining programmes for meetings, allocation of duties, internal assessment and moderation and for other extracurricular activities such as sport. These plans had

action items that stipulated dates and persons responsible for each item, e.g. the maths HoD was responsible for standardising and moderating all formal assessment tasks. Part of these meetings was to monitor curriculum coverage through tracking teachers' work against the work schedule and pace setters.

The school used a point system (that took into account other extra-curricular engagements) to allocate work distribution among educators. Work distribution was not driven by policy directives that prescribe work load per post level, but was informed by the school's contextual factors e.g. a teacher running a hectic sports programme would have reduced number of periods to accommodate his/her tight programme. Even though the junior teacher acknowledged that the curriculum was effectively managed, she believed that there was still room for improvement. However, systems and processes in the school justified and premised strong arguments that the school managed the curriculum effectively.

1.2. Curriculum and pedagogy: Rating 3

Planned and regular meetings to discuss and give feedback on instructional practice among staff members.

The principal stated that collegial practices were integral and embedded within the school culture and values. The HoD observed maths lessons once or twice a week, depending on the experience and knowledge of educators. Lesson observation to new teachers was more on strengthening their subject and pedagogical knowledge by giving constructive feedback after each lesson. For experienced teachers, lesson observations were more on motivation that involved mutual discussions on innovative strategies that could improve classroom practices e.g. displaying to teachers innovative teaching strategies that use electronic gadgets such as "mixit" to teach maths.

Supporting the HoD, the senior teacher confirmed that team teaching occurred when there was a need i.e. when a new section was introduced to the syllabus, as was the case with the changes in the streamlining and strengthening of the curriculum. Teaching together helped teachers who felt they needed additional support and were not confident enough to teach certain mathematical concepts such as linear programming. Over and above these formal meetings, the junior maths teacher mentioned that sometimes informal discussions on teaching matters happened in the staffroom. In most, these informal discussions focused on interesting educational debates either read from the print media or downloaded from websites.

The principal advised that teachers need to work in professional learning communities in order to reflect on and analyse their work in a continuous improvement cycle. Subject specific meetings were held every Wednesday to discuss among others topics such as "technology aided teaching". The HoD referred to these weekly meetings as "how to meetings; for example, how to approach probability in mathematics". The senior maths teacher met with the HoD once a week for an hour and five school meetings about professional development were conducted every term by the principal or external facilitators. In these meetings, teachers were also provided with opportunities to present topics of interest or recent developments in education. "We need to keep on learning – the day you stop learning is the day you stop teaching" (junior maths teacher).

Continuing professional development

School has a programme that supports professional teacher development, aligned with the needs of the school and those of individual teachers.

Participants defined professional teacher development as a means of improving and extending the teacher's knowledge, updating teaching methods and getting fresh ideas about classroom environment change. In the words of the HoD, it is simply "about how to become a better teacher". The school had a programme that supports professional teacher development scheduled every Wednesday and three Saturdays a year. The principal cautioned that she generally did not support professional development that was too far removed from the classroom.

2.1. Networks and collaborations: Rating 3

There is evidence that subject teachers participate in clusters and networks outside of the school.

The school ran a network of professional learning community of approximately 10 schools covering seven subjects and the principal was in charge of the project. The HoD was the maths examiner for the National Department of Education and moderated final maths papers for the National Senior Certificate examinations. Maths teachers participated in networks like DIPIP (data informed practice improvement project), IEB maths interest groups and maths FET yahoo. They all maintained that these collaborations and networks were hugely valuable as they provided platforms for knowledge sharing and professional development.

Teachers also participated in conferences organised by unions such as the National Union of Educators, where new maths content and other subject specifics were discussed. Participation in these conferences is voluntary and in most cases teachers affiliate to participate in these professional development activities. Unfortunately, teachers found it demanding supporting so many underperforming schools who mostly did not really want to put on the effort needed to change, according to the principal.

2.2. Induction, coaching and mentoring: Rating 3

School has an effective induction programme for newly qualified teachers and provides supportive mentors and coaching sessions.

According to the junior maths teacher, the school had a system of "internal referrals" where new teachers accessed mentorship and coaching from a pool of experienced maths teachers. Teachers identified topics (such as statistics, Euclidian geometry) from which they collectively shared skills and ways of teaching such topics. Junior teachers were provided with opportunities to observe or to be observed by senior teachers. These interactions transcended beyond discussions about content knowledge because they also embraced discussions on pedagogy and the sharing of resources. "We learnt indirectly by watching others in the past years, currently new teachers were mentored and coached by their HODs", explained the principal.

2.3. Teachers' sense of responsibility: Rating 3

Teachers proactively take responsibility for their own learning and professional development activities engage teachers as learners.

Teachers were involved in development activities such as the Integrated Quality Management System (IQMS). In short, IQMS is a performance management review system for teachers to reflect and improve their classroom practice. Performance of each teacher is reviewed by a peer educator and a senior management staff through lesson observations and together, they provide feedback based on these lesson observations. During the process, teacher's strengths and weaknesses are identified and interventions to address identified weaknesses are recommended. Based on these recommendations, a teacher will on his own decide on whether to register for a skills programme that will work towards addressing the identified weaknesses. The Department of Education provide bursaries to fund these programmes

There was also evidence to show that most teachers acquired their postgraduate qualifications through part-time correspondence. This indicated how teachers took responsibility for their own learning considering their preparedness to sacrifice considerable time and money in search for knowledge. The assertion by the junior teacher who felt that she needed to become more of a maths specialist supported the argument advanced. "Opportunities for further development existed, I'm currently studying Mathematics II" said the junior maths teacher.

Internal Accountability

School has a planned internal assessment programme that supports curriculum coverage and tracks performance.

The school had a structured programme for internal assessment for monthly and quarterly tests. The HoD remarked that while teachers were given autonomy regarding monthly tests, quarterly tests were not negotiable and the school strictly implemented and observed the plan. The senior maths teacher confirmed that the assessment plan outlined procedures (dates for submission of question papers for moderation and typing) to be followed during assessment cycle. This, according to the senior teacher ensured consistency and uniformity across the school. The junior maths teacher said teachers like working through the assessment plan because teachers knew their responsibilities and expectations in this regard.

3.1. Efficient use of data: Rating 3

Individual teachers use data from all forms of assessment to inform and improve teaching and learning.

All participants agreed that teachers use data collected from different forms of assessment to improve their teaching practice. Learners were assessed through various forms including research projects on selected topics, investigations, designing mathematical models, assignments, etc. Data collected was analysed and feedback was given to understand learners' misconceptions. This process was critical because teachers also reflected on and interrogated their own classroom practices. Unlike in most schools where teachers attributed poor performance to learners' attitudes, the school adopted a comprehensive reflective process where all stakeholders involved were responsible to learner outcomes.

In order to take assessment to the next level, the junior teacher hoped that one day the school would integrate DIPIP in its learner assessment processes. She was involved in the DIPIP at Wits University and they used data collected from various forms of assessment for error analysis and to inform practice. Regarding the national senior certificate examinations, the principal lamented that they did not get enough specific and relevant analysis from matric results.

3.2. Collegial practice on assessment: **Rating 3**

Regular structured sessions to discuss learner achievement and performance and to evaluate levels of achievement against expected outcomes.

There was agreement among participants that feedback sessions were conducted to discuss learner performance. This happened after every quarter and sometimes an analysis of results by the HoD was distributed "with an assumption that teachers would take something out of the analysis". Parents received progress reports for their learners every quarter and follow up discussions with parents of underperforming learners were held to discuss how collaboratively they could assist these learners.

After quarterly analysis on learner performance, specific intervention strategies and remedial programmes for underperforming learners were designed. These included interventions such as the provision of extra lessons and supervised homework conducted by subject teachers. All learners participated in the Computer Aided Mathematics Instructions (CAMI), a mathematics software programme as an additional support strategy. The CAMI programme assisted learners to work on mathematical concepts on their own pace and is a perfect tool for both enrichment and remediation.

3.3. **Moderation of assessment**: **Rating 3**

The HoD moderates and gives feedback on all forms of formal assessment.

"I use a certain document to rank the order of questions when assessing learners", said the HOD. She also relied on her intuition and experience and, sometimes asked colleagues to get a balanced opinion about the standard of the test. The senior teacher emphasised that tests were moderated by the HoD, however, she categorised her questions into basic, medium and complex. The junior teacher followed the normal test grid i.e. "30% easy questions, 50% average questions and 20% challenging questions".

4.3 School A2

School A2 is a high school situated in the suburbs of Nelspruit, serving mostly the middle income earning group. The new democratic dispensation in 1994 completely changed the demographics of the school and learners from the emerging new African middle class account for more than 85% of the school population. In 2011, parents paid R11 500 in school fees. The newly appointed principal had more than 35 years of teaching experience while the HoD had over 22 years experience of maths teaching.

Instructional leadership

School focuses on the management of teaching and learning. The role of the instructional leader was described by participants in terms of managing teachers, overseeing staff matters and coordinating HoDs. Through coordination, HoDs submitted all their departmental subject allocations to the principal to ensure effective delivery of the curriculum. The HoD argued that the instructional leader should be a "person having good subject knowledge, knowing the curriculum inside out and who motivates teachers". The junior teacher added that instructional leaders inspire and support teachers to implement the curriculum.
1.1. Management of curriculum: **Rating 3** **There is evidence that the school has systems to ensure effective management of curriculum.** All participants agreed that the school has systems to ensure effective management of the curriculum. "I coordinate all responsibilities delegated to the HoDs to ensure that teaching and learning takes place and that the curriculum is delivered effectively, said the principal". Various departments, as guided by the NCS documents such as the Learning Programmes and Subject Assessment Guidelines, ensured that that subject teachers taught according to the work schedules and the pace setters. HoDs monitored curriculum delivery by conducting class visits, checking learners' books and teachers' files, controlling the mark sheets and ensuring that teachers under their management followed the assessment timetable. HoDs were then expected to present subjects reports for discussion in management meetings coordinated by the principal.

The HoD ensured that teachers were allocated grades according to their experience and expertise. "We go all the way out to make sure that we appoint competent teachers in this school". She stressed that her department did not want to be stuck with dead woods which would be a liability to the school and would also be difficult to discard. That statement was supported by the senior teacher who mentioned that the maths department always appointed knowledgeable teachers and the HoD provided necessary supporting resources to the maths teachers.

1.2. Curriculum and pedagogy: Rating 1

Planned and regular meetings to discuss and give feedback on instructional practice among staff members.

The HoDs ensured that their departments held regular meetings as outlined in their strategic plans. However, the evidence collected showed that these meetings focused only on curriculum compliance as stipulated (number of classworks and tests given, curriculum coverage) in the NCS documents. Teachers were not given opportunities to discuss feedback on classroom visits conducted and to explore opportunities for collegial practices such as team teaching and interclassroom partnerships.

Participants advanced various reasons why the school did not promote these opportunities for teachers to discuss issues of pedagogy and embrace collegial practices. The principal complained that the departmental policies made it difficult for the school to control and manage learners' intake. She maintained that classes were so overcrowded that it became literally impossible for teachers to have sufficient time to discuss these issues.

On the other hand, the HoD claimed that teachers could manage their own classes and there was no need for "interference or external involvement". "Selection of our teachers is rigorous and we remain confident that they are competent enough to deal with classroom challenges", she said. The junior teacher confirmed that only informal discussions on teaching matters were held in the staffroom and teachers voluntarily helped each other when conducting extra classes. "If I want to experiment on any innovative teaching idea, I must get approval from the HoD first, claimed the junior teacher".

Continuing professional development

School has a programme that supports professional teacher development, aligned with the needs of the school and those of individual teachers.

Professional teacher development is concerned with conducting in-service programmes to develop teachers, according to the principal. However, she added that the teacher's primary commitment and dedication is to develop learners as opposed to his/her own development. The principal warned that attending development courses or committing more time to personal development was detrimental to the broad vision of the school and teachers should meticulously balance the two. The principal did not hesitate to claim that the school's NSC results dropped because the previous principal dedicated most of his time on education matters (courses, workshops, principals' meetings, etc) outside of the school.

2.1. Networks and collaborations: Rating 2

There is evidence that subject teachers participate in professional learning communities outside the school.

There was evidence that participants collaborated with other teachers in local networks and clusters. However, the principal had some reservations on the value of these networks. She attended circuit meetings once a month. These "information sharing" meetings were compulsory for principals to attend even though the principal upheld that there was little value in attending these meetings. Contrary to the principal's perception about clustering and networking, all other participants argued for and defended the importance of their maths cluster.

Once the leader of the local maths cluster, the HoD argued that teachers shared ideas, worksheets and examination papers in cluster meetings. "These clusters provide us with an opportunity to learn some innovative practices from other schools and we realise that systemic challenges pertaining to learner performance are not exclusively symptomatic to our own school", said the HoD. The senior teacher argued that important information about the curriculum was disseminated in cluster meetings hosted by district officials (curriculum implementors).

For the fact that other participants recognised clusters as valuable platforms for knowledge dissemination, with the exception of the principal, I scored the indicator 2. The principal's

perception on the role of these networks could be an impediment but did not imply that teachers were not participating and collaborating with others in clusters.

2.2. Induction, coaching and mentoring: Rating 2

School has an effective induction programme for newly qualified teachers and provide supportive mentors and coaching sessions.

Even though the school had an induction programme, it was not as effective as it should be. The principal completely excluded herself and emphasised that induction, coaching and mentoring were responsibilities of HoDs. The HoD and senior teacher ensured that newly appointed teachers received all necessary documents. A mentor would then be allocated to a teacher and intensive class visits happened in the first term. This was confirmed by the junior teacher who mentioned that all maths teachers were supportive and she could ask for help from anyone.

In this case, delegation of this role to HoDs by the principal meant complete abdication of authority. Unlike in the case of managing the curriculum, where HoDs presented and discussed developments of their departments in management meetings coordinated, there was no evidence to support established systems and processes for mentoring and induction. "I'm not involved on this issue because it is within the mandate of HoDs, said the principal". Secondly, the restriction of the induction programme to the first term only is questionable, given the understanding that the mentoring and induction processes could prolong until all parties involved are satisfied , hence the rating of 2.

2.3. Teachers' sense of responsibility: Rating 3

Teachers proactively take responsibility for their own learning and professional development activities engage teachers as learners.

There was evidence to support that teachers were responsible for the own learning and professional development. The principal argued for a balance between school development and personal development imperatives. "There should be systems to ensure that teacher development activities translate into improved learner performance", cautioned the principal.

The response of the junior teacher was encouraging. "The school believed in me even though I did not have proper qualifications to teach maths, she said". The fact that she started as an assistant teacher without academic qualifications and later acquired appropriate qualifications shed some light

on her attitude towards self improvement and development. Secondly, teachers' attitudes, as reflected by their willingness to attend cluster meetings and workshops, further justified the extent to which they took responsibility for their own learning and professional development. There were also efforts to retain highly qualified teachers in the school through some incentives (financially or redesigning the job specifications).

One of the deputy principals had a PhD degree in Psychology and was responsible for all human resource development initiatives. She discussed personal growth plans with individual teachers and recommended development courses for them. The principal insisted that all internal or external development programmes organised by the deputy principal were more useful compared to those organised by the department. Over and above that, the HoD said that she encouraged her teachers to study further to upgrade and for professional development. She distributed study brochures and materials from universities and ensured that her staff had enough time for study leave.

Internal Accountability

School has a planned internal assessment programme that supports curriculum coverage and tracks performance.

All participants agreed that the school had a focused programme for internal assessment that required teachers to give one informal test in a seven day cycle. Three internally moderated assessments (tests, assignments or projects) were given in each quarter, except in the last quarter when learners were prepared for the final examination. Time table for these formal assessments was important because it showed planning and ensured standardisation (moderation and analysis of results). All participants agreed that the HoD was responsible for quality assurance, except in case of external assessments which were coordinated by the clusters.

3.1. Efficient use of data: Rating 1

Individual teachers use data from all forms of assessment to inform and improve teaching and learning.

Participants stated that data collected from learners' assessment tasks was analysed to improve teaching and learning. "We have our own internal assessment programme and we also write common papers managed by the curriculum implementors once a term", said the principal. The school would

then design an improvement plan based on the analysis of these results that included among others, a remediation strategy for weak learners.

The HoD said she used the data to differentiate learners according to their abilities. Differentiation of learners enhanced the design of appropriate intervention strategy that target specific groups of learners. "I have a problem with intervention strategies that only target weak learners because they may breed negative perceptions among weak learners as they are constantly being under the spotlight", said the senior teacher. He advised that there should be some efforts to engage gifted learners; otherwise they might also feel neglected.

This indicator was rated 1 because there was no evidence to show that teachers use the data to reflect on their practice as well. It appeared that poor learner performance was conclusively attributed to learners with no efforts to reflect on or engage some stakeholders that might as well affect learner achievement. This form of practice and behaviour is perceived to be weak and incomprehensive.

3.2. Collegial practice on assessment: Rating 1

Regular structured sessions to discuss learner achievement and performance and to evaluate levels of achievement against expected outcomes.

There was no agreement among participants regarding the frequency of meetings and programmes to discuss learner achievement and performance. "It is the responsibilities of HoDs to ensure that all formal assessment tasks (including tests, assignments, projects, investigations, etc and all these contribute to the final year mark) are coordinated and meetings are held to discuss learner achievement", said the principal. According to the senior teachers, a subject coordinator (often a senior teacher) for every grade was responsible for coordinating the setting of tests. What happened after these formal assessments of was arbitrarily left to individual subject coordinators.

The junior teacher agreed that there was no consistency and it appeared that subject coordinators indiscriminately decided when to call these meetings."It appears to me as if subject coordinators call meetings when they feel like and we are informed to work towards meeting performance targets of the school, said the junior teacher". Collegial practices, where teachers discuss in depth the performance of learners well beyond intervention strategies and remedial plans, did not exist. Therefore, the benefit that could be extracted through the collective reflection on learner achievement and performance was undermined.

3.3. Moderation of assessment: Rating 3

The HoD moderates and gives feedback on all forms of formal assessment.

All participants agreed that the HoD moderated formal assessment tasks. As a matter of protocol, setting of formal assessment tasks was coordinated by subject coordinators and then submitted to the HoDs for moderation and standardisation. This ensured that capacity was built within the whole department to enhance a seamless transition should the HoD decide to leave the maths department. Secondly, it mitigates risks associated with centralising all key responsibilities to one individual i.e. instead of backing a champion, the whole team is capacitated.

The senior teacher said he used his logic to make sure that the tests were standardised and balanced. "I believe that setting difficult tests would break the learners and consequently, I ensure that 40% of questions are easy, the other 40% are intermediate and the remaining 20% are difficult. In this manner, he built confidence among learners and there was no way his learners might be lost to mathematical literacy stream.

4.4 School B1

School B1 is a high school situated in the outskirts of Thohoyandou in Limpopo province. The school had been declared a no-fee school (all learners were exempted from paying fee) because it served learners from poor socio-economic backgrounds. The principal and the maths senior teacher had Bachelor of Science degrees while the HoD and the junior maths teacher had Diplomas and Advanced Certificates in Education. The HoD had 11 years experience of maths teaching and the senior maths teacher had eight years of maths teaching.

Instructional leadership

School focuses on the management of teaching and learning.

All participants stated that the principal is considered to be the instructional leader of the school. The principal ensured that the vision and mission of the school was achieved and controlled everything in the school. According to the principal, his role was to monitor and collate teachers' mark sheets and

to conduct classroom visits. In support of the principal, the HoD monitored that teachers observed the time-table and analysed learner performance, especially from external tests.

1.1.Management of curriculum: **Rating 3**

There is evidence that the school has systems to ensure effective management of curriculum.

All participants agreed that the school has systems to manage the curriculum effectively. The school management team had annual strategic meetings in the last quarter to review and assess if the current systems and processes contributed positively towards achieving effective teaching and learning in the school. The agenda of these annual strategic meetings is informed by discussions and deliberations within various departments. "As the principal, I ensure that all these discussions are aligned to the broader mission and vision of the school. In most cases, I participate in every departmental meeting to foreground the purpose of the meeting as opposed to influencing the outcome of the meeting", he continued.

"Each department is mandated to decide on subject classification and allocation of duties to teachers", said the HoD. The HoD ensured that teachers followed the learning programme and the work schedule as outlined by the NCS through rigorous monitoring. He randomly collected learners' portfolios and teachers' files every month. "We agreed as the maths department that discipline and dedication would be the pillars of our strength, and as such all maths teachers strictly adhered to the timetable and respected learners' contact time", claimed the HoD. To a certain extent, teachers were allowed to debate work allocation and consult privately with one another before the HoD's final recommendation to the senior management.

The senior maths teacher mentioned that the principal ensured that there was effective teaching and learning and that was evident in the good results the school produced. "We produce quality maths results and we are the second best performing school in the district", boasted the senior teacher. The junior teacher perceived their maths department to be well organised and efficient. "We plan in advance when to conduct our meetings, we have clear processes that guide our learner assessment cycle and we know exactly our responsibilities and expectations, he said".

1.2. Curriculum and pedagogy: Rating 1

Planned and regular meetings to discuss and give feedback on instructional practice among

staff members.

Participants agreed that their maths department held planned and regular meetings. Unfortunately, their meetings focused more on curriculum compliance. "The HoD checks whether we are on track with the work schedule and if we give learners activities according to the pace setter", said the senior teacher. Informal discussions on teaching matters were held when teachers experienced problems in some maths topics or when any member of the school management discovered that a particular teacher needed support. The HoD mentioned that teachers were encouraged to teach together after normal contact time, especially during revision sessions.

"We never thought of formalising discussions on instructional practices in our meetings", confessed the HoD. The junior teacher stated that they sometimes had informal discussions in the staffroom on how they could improve their classroom practice. "I remember the other time one of our colleagues alleged that teaching 'Singapore Mathematics' will help us improve the quality of our maths results. That teacher promised to bring more information but we are still waiting to know more about 'Singapore Mathematics' until today", he added. This lack of coherent systems to discuss developments and feedback on instruction indicated the absence of efforts to encourage inter-classroom partnerships and team-teaching within the school. Even in cases where teachers have claimed to work together, their responses were so fragmented and lacked substance, hence the rating of 1.

Continuing professional development

School has a programme that supports professional teacher development, aligned with the needs of the school and those of individual teachers.

According to the principal, professional teacher development refers to the process where teachers' needs and expectations are met to suit the mission and vision of the schools. "Professional teacher development is about courses and workshops", explained the senior teacher. The principal insisted that the teacher development programme was informed by the needs or expectations of teachers.

2.1. Networks and collaborations: Rating 2

There is evidence that subject teachers participate in professional learning communities outside the school.

Some teachers participated in the local cluster networks and AMESA (Association for Mathematics Education of South Africa). Unless in the case of clusters which were coordinated by district officials, participation in other professional bodies appeared to be voluntary. “I always wanted to become a member of AMESA but I can’t afford annual subscription fees and money to attend national conferences”, claimed the senior teacher. The principal was once the secretary of the regional AMESA and chaired the local cluster. “In the local cluster, maths teachers discussed curriculum matters, common papers and this provided a platform for interactions and conversations for maths educators”, said the principal.

All participants valued networking and collaborative opportunities presented by networking and clustering platforms because educators discussed relevant curriculum issues that focused on challenging sections of the syllabus. “These networks are a source of motivation because some expert teachers from other schools show us some approaches on how to teach challenging topics, the junior teacher justified”. We are also encouraged to bring challenging questions from previous examination papers for discussions”, he added. The challenge, however, remains how to take these clusters forward and develop them into professional learning communities.

2.2. Induction, coaching and mentoring: Rating 2

School has an effective induction programme for newly qualified teachers and provide supportive mentors and coaching sessions.

Participants agreed that newly qualified teachers were inducted and mentored. Induction usually involved informal discussions between the senior teacher and the newly qualified teacher, according to the HoD. “As a newly qualified teacher, I was afforded an opportunity to relate my expectations and aspirations about my teaching career”, said the junior. He recalled how the senior teacher, as part of mentoring process, moderated and standardised his maths tests. “That illustrated to me the wealth of experience and the knowledge the senior teacher had”, explained the junior teacher. However, these processes were not formalised into effective induction and mentoring programme, hence the rating of 2.

2.3. Teachers’ sense of responsibility: Rating 3

Teachers proactively take responsibility for their own learning and professional development activities engage teachers as learners.

In terms of teachers taking charge of their own learning, participants highlighted that the majority of teachers were furthering their studies for higher qualifications. The articulation of participants that clusters were a source of motivation as they provided platforms for role-modelling appeared to have a significant impact on their attitudes for own learning as well. However, the principal cautioned that sometimes there was a tension between personal development and the school's expectation because the correlation between teachers' personal development and learner achievement was barely visible.

Internal Accountability

School has a planned internal assessment programme that supports curriculum coverage and tracks performance.

All participants agreed that the school had an internal assessment plan and this made the work to be manageable to both teachers and learners. This plan was convenient as it slotted different times for writing tests, explained the HoD. It was also regarded as a professional way of managing internal assessment and helped in setting of targets. The junior teacher concluded that the plan helped teachers to complete the syllabus.

3.1. Efficient use of data: Rating 2

Individual teachers use data from all forms of assessment to inform and improve teaching and learning.

All participants agreed that data collected from assessment activities was relevant, especially for remediation and designing intervention strategies. According to the principal, maths teachers were encouraged to give informal tests but more focus was on formal assessment (includes tests, assignments, projects, investigations, etc.) given every quarter. "We use these quarterly assessments to create high expectations to our learners because we raise the bar higher every term", said the HoD. "This helps the school to set targets and improve their quality of our results", he added. The principal and the HoD remained convinced that rigorous assessment of learners, coupled with constructive feedback was crucial to improvement of performance.

"Information gathered from learners' assessment tasks help us to design some remediation

interventions", said the senior teacher. "As we analyse performance of our learners, we consequently design intervention strategies to ensure that quality learning programmes were delivered", he continued. However, in all responses, it remained unclear how maths teachers used the collected data to design quality learning programmes and how teachers improved teaching and learning through the use of this data. Secondly, reading through and interpreting participants' responses, teachers could not elaborate how different they approached topics for revision. I rated this indicator 2 to acknowledge teachers' efforts for data analysis and for designing intervention strategies.

3.2. Collegial practice on assessment: **Rating 2**

Regular structured sessions to discuss learner achievement and performance and to evaluate levels of achievement against expected outcomes.

There was no agreement among participants on structured sessions to discuss learner performance. On one hand, meetings that focused more on feedback from internal and external assessment of learners were conducted, according to the HoD. "We discussed feedback on learner performance every week or two and teachers conducted afternoon revision classes in cases where most learners underperformed", said the HoD. Members of the maths department analysed learner performance to identify areas of weakness and design appropriate remedial programme, especially after the June and September assessment cycles.

Contrary to the HoD's statements, the senior teacher said that these discussions occurred once a term and only if anything regarding learning learner performance cropped out. "We only have comprehensive discussion meetings on learner achievement if we notice unfamiliar swings in learner achievement", remarked the senior teacher. "In some extreme cases, parents of under- performing learners are summoned to the school to address the matter holistically", he added. The junior teacher stated that there was no consistency, and these meetings were held once or twice a term. Depending on the analysis of results, teachers may swap classes or give extra work to underperforming learners. This indicator was scored 2 because participants' responses showed that something was happening.

3.3. Moderation of assessment: **Rating 3**

The HoD moderates and gives feedback on all forms of formal assessment.

All participants agreed that the HoD was responsible for monitoring and standardising all formal assessment tasks every term. "He is in charge for controlling our work within the maths department",

claimed the senior teacher. “He ensures that all tests include high order and low order questions to maintain the required standard”, he continued. According to the principal, the HoD’s role included the control and recording of a summary of learners’ mark sheets, and ensuring that appropriate resources were allocated to teachers to ensure that they successfully implemented the curriculum.

“I prefer setting what I call “uncontaminated questions” referring to questions that learners have never seen before”, said the HoD. These questions were usually downloaded from the internet using open source software. “I ensure that tests cover all learning outcomes to ensure that learners’ cognitive levels are covered”, insisted the HoD. The junior teacher mentioned that it was difficult to standardise the test and relied on the expertise of the HoD to ‘balance’ the test. All participants, in principle, acknowledged the central role of the HoD in ensuring that tests were standardised.

4.5 School B2

School B2 is a high school situated in the outskirts of Makhado (formerly known as Louis Trichard) in Limpopo province. Because of the poor socio-economic conditions in the area, the school had been declared a no-fee school. All participants had Bachelor of Science degrees with the exception of the HoD who had a Bachelor of Arts and a Secondary Teachers’ Diploma. The principal has 32 years of maths teaching, the maths HoD has 10 years experience of science teaching and the senior maths teacher has 17 years of maths teaching.

Instructional leadership

School focuses on the management of teaching and learning.

Participants identified leading and managing as the core duties of the principal. Leadership and management tasks were achieved through delegating duties to all educators, creating an environment that was conducive to teaching and learning and making sure that the school was running properly. Instructional leadership is about giving instructions, putting the curriculum into practice, advising teachers on subject content to be covered in each grade. According to the junior maths teacher, as an instructional leader, the principal controlled teachers and made announcements because he was in charge of the school.

1.1.Management of curriculum: **Rating 3**

There is evidence that the school has systems to ensure effective management of curriculum.

All participants agreed that their school had systems in place to manage the curriculum effectively. The SMT discussed and drafted teacher allocation which was finally adopted by subject teachers. This draft subject allocation was informed by the previous performance feedback from teachers and also recognised the experience of individual educators. "As the principal of the school, I support effective teaching in the classroom by ensuring that written work is controlled, conducting class visits and ensuring that teachers have necessary teaching aids in their classrooms".

Classwork books were moderated quarterly by the HoD and moderation reports were submitted to the senior management. "As the subject head, I help my subordinates by monitoring their work and by conducting pre and post moderation on assessment tasks", commented the HoD. The senior maths teacher also perceived the management of the mathematics curriculum as effective; she mentioned that they held regular subject meetings strategising how to improve learner achievement. This perception was supported by the junior maths teacher who indicated that the HoD regularly check learners' workbooks.

1.2. Curriculum and pedagogy: Rating 2

Planned and regular meetings to discuss and give feedback on instructional practice among staff members.

All participants agreed that maths teachers held formal meetings, which focused on monitoring and implementation of the curriculum, i.e. checking the number of classworks, tests and projects written. The principal insisted that teachers were engaged in collegial practices in these meetings, such as debates on critical developments within the maths curriculum. "I'm very certain that my teachers look for ways and means to improve their classroom practices because they worked regularly in teams", said the principal.

However, the HoD mentioned that these meetings could benefit their department if taken to the next level. "It is our wish to start debating strategies and ways on how to improve the quality of teaching and learning", said the HoD. The senior teacher mentioned that they sometimes discussed certain sections of the syllabus informally in the staffroom. "I think you are aware that geometry poses some challenges to educators and we casually discuss how we can assist one another as colleagues", said

the senior teacher. The junior maths teachers said that team teaching would create situations where learners would compare teachers instead of appreciating new teaching strategies for their maximum benefit.

Continuing professional development

School has a programme that supports professional teacher development, aligned with the needs of the school and those of individual teachers.

There was common understanding among participants that continuing professional development of teachers is about improving teacher's competence, enrichment and enhancement of teaching knowledge. The school was seen to be supporting continuing professional development primarily through participation of teachers in departmental workshops. On return from workshops, teachers were expected to provide feedback to their fellow peers in various departments.

2.1. Networks and collaborations: Rating 2

There is evidence that subject teachers participate in professional learning communities in the school.

Apart from participation in circuit and cluster activities, the school collaborated with neighbouring schools. "We invite high performing educators from other schools to teach our learners during winter and spring vacations", commented the principal. That provided learners with opportunities of learning from different educators and accessing diverse ways of teaching. The senior teacher emphasised that collaborations in clusters provided opportunities for knowledge expansion in newly introduced topics such as financial maths. In such forums, expert teachers through modelling, simplified teaching approaches to mathematical concepts which were viewed as challenging. "Teachers get more knowledge from these forums and share it with colleagues at school", said the HoD.

However, the junior maths teacher said she did not attend any of the cluster meetings because she was regarded as unqualified because she did not have a professional qualification. This typically showed how the school misunderstood the crucial role professional learning communities could have on the development of teachers. Ironically, teachers considered to be unqualified could benefit better from these interactions, and their attendance should be involuntary and non-negotiable. The fact that

the school was open to other educators showed the extent to which it valued collaborations and expertise outside the school. By tapping into this expertise will also strengthen their internal capacity, hence the rating of 2.

2.2. Induction, coaching and mentoring: Rating 1

School has an effective induction programme for newly qualified teachers and provide supportive mentors and coaching sessions.

There were opposing views with regard to coaching and mentoring processes and this indicated the absence of an effective induction programme in the school. The principal stressed that newly appointed teachers were inducted and thereafter partnered with experienced teachers. "I'm responsible for mentoring new maths teachers, ensuring that they attend and participate in subject meetings and supporting them in their classrooms through class visits".

Contrary to the principal and HoDs' assertions, the senior teacher maintained that there was no classroom support for new educators. "It is ridiculous to claim that we support new teachers, no ways, here you are on your own", claimed the senior teacher. This claim was supported by the junior teacher who confirmed that she was never inducted or allocated any mentor. "I was literally thrown into the classroom without any support and ultimately, I survived", she continued. These conflicting responses by participants pointed to weak induction practices, if any, to support new teachers.

2.3. Teachers' sense of responsibility: Rating 1

Teachers proactively take responsibility for their own learning and professional development activities engage teachers as learners.

The principal and the HoD agreed that teachers were advised to further their studies in order to upgrade their qualifications. "It is the responsibility of the department to develop teachers," commented the HoD. The junior teacher argued that some teachers still needed to be developed, especially on challenging topics. "We should identify the teacher's strength and weakness, deploy or allocate the teacher appropriately to the grade and recommend further training", responded the senior teacher when asked how teachers could be supported to deepen their content and pedagogical knowledge.

Unfortunately, all these responses did not justify that teachers were proactively taking responsibility

for their own learning and development. The HoD's argument that some teachers should be developed by the department showed that she displayed a passive attitude to her own knowledge deficiencies. Similarly, the senior teacher's assertion that somebody should recommend further training for teachers strengthened the negative perception that teachers were not masters of their own professional growth and should rely on external intervention for their own development.

Internal Accountability

School has a planned internal assessment programme that supports curriculum coverage and tracks performance.

Participants unanimously agreed that a programme for internal assessment was available. This programme was designed by the district officials to ensure that all schools within the district write common controlled tests. The programme assisted teachers in monitoring learners' progress. All participants valued the importance and relevance of standardised testing and advocated for its retention. They perceived standardised tests such as 'high stakes matric examinations' as appropriate tools for selecting university students. These tests ensured uniformity across all provinces and might be a solution for secondary schools to get quality learners should they be administered in primary schools as well.

The internal assessment programme ensured compliance in terms of protocol on assessment and submission dates for moderation. However, departmental meetings to discuss feedback on learner performance and achievement were not formalised.

3.1. **Efficient use of data: Rating 2**

Individual teachers use data from all forms of assessment to inform and improve teaching and learning.

All participants agreed that teachers analyse data gathered from formal assessment tasks. The principal remarked that the data collected helped educators to identify areas where learners experience difficulties. "Secondly, low learner performance may be an indication of educator incompetence or lack of knowledge", he added. The HoD said that she conducted post moderation in areas where learner performance was below required standard and teachers were urged to design intervention plans for remediation. "I expect teachers to submit plans for remedial interventions to

me so that I could monitor implementation of those plans, she said".

The senior teacher said that data collected from formal assessments assisted in identifying and working on learners' weaknesses. This analysis of learners' data enables teachers to design intervention strategies and remedial programmes for underperforming learners. Remedial programmes included giving extra work to learners in the afternoons and conducting supplementary tuition on Saturdays. The junior teacher explained that she used the collected data to rate top 10 learners in her maths classroom. "This motivates and inspires learners to work harder in order to achieve top 10 merits, she explained".

All these good efforts miss one token to complete the puzzle. Participants did not mention how teachers used the analysed data to reflect on their practice. It's going to be difficult for teachers to improve teaching and learning by using the analysed data if they do not interrogate and put their classroom practices to scrutiny as well. However, teachers' efforts in data analysis and remedial programmes were acknowledged, hence the rating of 2.

3.2. **Collegial practice on assessment: Rating 2**

Regular structured sessions to discuss learner achievement and performance and to evaluate levels of achievement against expected outcomes.

The school had a programme to conduct feedback sessions on learner performance and achievement, according to the senior teacher. Teachers could also give informal tests any time depending on the learners' progress scope of work covered. However, participants gave different accounts on when they collectively discussed and analysed feedback on learner performance. The senior teacher maintained that they discussed all grades results annually in January. This was in contrast to the HoD's assertion that these discussions happen monthly.

"The HoD will only call an urgent meeting to discuss interventions strategies to help under-performing learners. We do not discuss in depth the causes and reasons for such performance, it is like putting a wall paper to cover cracks on a wall", the junior teacher complained. Because of the contradictions between the views of participants, I concluded that even though the school did have a programme to conduct feedback sessions on assessment, these meetings were not exhaustive enough to unearth root causes of under-performance. Obviously, it remained individual teachers' prerogative to analyse learner performance and that was not necessarily done collectively. Consequently, the

school was rated 2 on this indicator.

3.3. **Moderation of assessment: Rating 2**

The HoD moderates and gives feedback on all forms of formal assessment.

The HoD said that there was a structured time table to moderate formal tasks such as tests and projects and she used a moderation tool supplied by the district officials. All participants insisted that their forms of assessments (tests or assessments) were moderated and controlled by the HoD. The HoD claimed that she used the Bloom taxonomy to ensure that all learners' cognitive levels were catered for.

Unfortunately, she could not elaborate more on how she used the taxonomy or couldn't provide convincing example on how different domains of the taxonomy (application, synthesis, knowledge, etc) were covered in tests she moderated. Even though all participants acknowledged the role of the HoD in moderation, failure to support her claims adversely affected the rating on this practice. Secondly, though it did not affect the rating, there were allegations that the HoD relied on the senior teacher for moderation because she did not have appropriate qualifications in mathematics.

In the next chapter, I will analyse and interpret these findings by comparing schools with the same socio-economic status and identify variables that differentiate one school from the other in each pair.

CHAPTER FIVE

5. ANALYSIS AND INTERPRETATION OF DATA

Building on the findings in Chapter 4 and the literature reviewed in Chapter 3, this chapter analyses, interprets and answers the primary question and subsidiary questions upon which this research was based.

Main research question: What activities are principals and teachers in schools supported by the Epoch and Trusts undertaking, which contribute to achieving the aims of the programme?

We disaggregated the main question into three subsidiary questions, based on three school level activities derived from the literature:

- What instructional leadership practices do school leaders establish and maintain in order to support teaching and learning in classrooms?
- What professional development activities are teachers in schools supported by the Epoch and Optima Trusts undertaking?
- How do educators use data collected from different forms of assessment to improve their teaching practice?

These questions will be addressed in this chapter and the one that follows. *Italicised paragraphs will form the base from which recommendations will be drawn and fuller recommendations will follow in Chapter 6.*

As mentioned earlier, this research study is informed by the school effectiveness tradition, which asserts that certain school practices have direct impact on learner achievement. Four schools were visited, two are former Model C (one high performing and one low performing) and the other two are former Department of Education and Training schools (one high performing and one low performing). Analysis and interpretation of the data collected from each school is framed on school practices identified earlier i.e. instructional leadership, continuing professional development and internal accountability. In recognising that the socio-economic status plays a

major factor in determining what happens in schools, and in line with the matched pairs design mentioned in Chapter 3, School A1 will be compared with School A2 and School B1 will be compared with School B2.

5.1 Instructional Leadership

5.1.1 Management of curriculum

	Management of Curriculum
School A1: 3	School had structures and systems in place to ensure effective management of the curriculum.
School A2: 3	School had structures and systems in place to ensure effective management of the curriculum.
Key variable/s	• *Distribution of authority.* Leadership and management roles were widely distributed to other tiers of the management hierarchy with clear channels of communication in School A1. In School A2, there was evidence that the principal abdicated some of her responsibilities completely to the HoDs e.g. the principal indicated that she had nothing to do with the induction and mentoring of new educators and as such, she was not in a position to shed any light regarding the indicator. • *Policy implementation.* There was evidence that School A1 had the capacity to contextualise policy imperatives to suit its environment – there was evidence to show that policy was implemented from a political discourse (*see definitions in the last paragraph before Section 5.2.1. on curriculum and pedagogy*) e.g. the school used a point system that considered the teacher's involvement in other affairs of the school to allocate work. No evidence to indicate that School A2 had the capacity in this regard – ordinary schools tend to implement policy from a rational discourse.
School B1: 3	School had structures and systems to ensure effective management of the curriculum.
School B2: 3	School had structures and systems to ensure effective management of the curriculum.
Key variable/s	• *Distribution of authority.* Authority was widely distributed to other tiers of the management hierarchy in School B2. In School B1, the principal preferred to be hands-on and adopted a centralist approach e.g. personally controlling learners' mark sheets and conducted class visits and observed lessons • *Policy implementation.*

	No evidence in both schools that indicated their capacity to contextualise policy imperatives – like ordinary schools, they implemented policy from a rational discourse e.g. work allocation was done in terms of the Educators Employment Act of 1998, Act 76.

Effective management of curriculum in schools is largely directed by policy imperatives as outlined in the National Curriculum Statement, especially directives from the following three documents: Subject statements, Learning Programme Guidelines and Subject Assessment Guidelines. Secondly, principals use variety of strategies to establish systems to ensure effective management of the curriculum. Some of these strategies, of course, are informed by principals' legitimate job descriptions and contractual obligations that stipulate their expected key performance indicators.

Distribution of leadership and management roles requires a balancing act, i.e. understanding teachers' emotional and job maturity (their willingness and competency to do the job). What differed across schools was the extent to which principals were willing to distribute this core responsibility to other members of school management team. If principals adopt a centralist approach or become "heroic leaders" in managing schools, they could create a negative culture of dependence. Consequently, they fail to nurture and develop the school's internal capacity, impede school's systemic growth and breed a culture of low morale among teachers.

Decentralising and distributing leadership roles through delegation show the degree of trust the principal is willing to invest among other staff members. Through delegation, the principal unlocks the potential and creativity of his/her staff and cultivates a sense of ownership within the school. Principals in Schools A1 and B1 managed the distribution of the leadership role expediently, thus making strong the presence of this activity in their schools. These could be one of the reasons why the two schools managed to improve or maintain the number of quality passes in mathematics.

The issue of distribution could not be discussed in isolation to debates on policy implementation. Schools differed in their abilities to contextualise and adapt departmental policies to suit their environment. Ordinary schools understand policy implementation as a straightforward process

that is non-negotiable and should be implemented as such i.e. they implement policy from a rational discourse. Dynamic schools on the other hand, understand policy implementation from a political discourse that permits contestations and mutual adaptations as the policy evolves.

5.1.2 Curriculum and pedagogy

	Curriculum and pedagogy
School A1: 3	There was evidence to support that teachers embraced collegial practices to improve instruction (teaching and learning).
School A2: 1	Lack of evidence to support that teachers embraced collegial practices to improve instruction (teaching and learning).
Key variable/s	• *Team teaching and lesson observations.* School A1 conducted 'how to' meetings to discuss innovative ways of teaching and to brainstorm solutions to challenges faced by some educators. The principal in School A2 cited overcrowding in classrooms as limiting factor for teachers to work together.
School B1: 1	Lack of evidence to support that teachers embraced collegial practices to improve instruction (teaching and learning).
School B2: 1	Lack of evidence to support that teachers embraced collegial practices to improve instruction (teaching and learning).
Key variable/s	• *Team teaching and lesson observations.* Meetings in School B1 focussed more on curriculum compliance and participants mentioned that the school never thought of formalising discussions on instructional practices in meetings. There were some comments from School B2 that team teaching would naturally prompt learners to compare teachers and create situations where learners would prefer some educators.

It appeared that in all schools visited, teachers had an understanding of the importance of embracing collegial practices, but they struggled to overcome challenges and practices of working in isolation, except in School A1. *Theoretically participants embraced or wish to embrace collegial practices that promote team teaching, inter-classroom partnerships and lesson observations. However, the reality on the ground as reflected by the participants'*

responses and practices proved otherwise because some schools could not at least provide convincing and compelling evidence to substantiate their claims to collegial practices. This lack of substance was also noted in participants' divergent responses to questions that probed collegial practices.

Providing empirical evidence to prove that collegial practices on knowledge and pedagogy by educators have positive spin-offs on learner performance could be the appropriate strategy to discourage and dismiss such uninformed and negative sentiments. In some schools, teachers only worked together when a new section was introduced to the syllabus or when teachers had challenges to a particular section, geometry was cited as an example. Unfortunately, discussions on teaching matters in most schools happened informally in staffrooms and programmes to discuss issues on knowledge and pedagogy were not formalised.

The literature indicates that schools will benefit if they can have structured and formal programmes on collegial practices on curriculum and pedagogy that promote team teaching, inter-classroom partnerships and lesson observations. By embracing these practices, opportunities to model best practices are created and developed. As this culture is internalised, teachers gradually abandon their traditional ways and methods of teaching, and learn contemporary pedagogies as demanded and informed by the current learning theories and curriculum changes. One of the pillars on which improved collaboration is premised, is the development of collaborative learning pods that allow everyone the freedom to teach and learn collaboratively (Harding, 2008).

This augurs well with what Linda Hodges did to foster professional growth among teachers (Stone, 2006: 23). Among other things, she shared expertise with teachers in her department and other departments in her school, presented workshops for teachers in other schools in her district, coordinated meetings of all science teachers from her district science school, etc. These collegial practices as articulated by Linda transcended beyond normal practices in schools where meetings focus on compliance to curriculum delivery. Checking the portfolios of educators and learners by HoDs as a starting point, should progressively start to address issues of the quality of work and extend beyond the confines of curriculum compliance.

5.2 Continuing Professional Development

5.2.1 Networks and collaborations

	Networks and collaborations
School A1: 3	There was evidence that teachers participated in local clusters and other professional bodies such as AMESA. The school also conducted a professional learning community comprising 10 previously disadvantaged schools.
School A2: 2	There was evidence that teachers participated in local clusters and other professional bodies such as AMESA.
Key variable/s	• *Professional learning communities.* School A1 transcended beyond participation in local clusters into actual institutionalisation of professional learning communities. This showed that it is not only concerned with the success of its own learners. The principal in School A2 argued that learner achievement (Grade 12) dropped because of the previous principal's over-commitment to outside education structures and networks. The challenge remained how to take these clusters forward and develop them into professional learning communities.
School B1: 2	There was evidence that teachers participated in local clusters and other professional bodies such as AMESA.
School B2: 2	There was evidence that teachers participated in local clusters and other professional bodies such as AMESA.
Key variable/s	• *Professional learning communities.* The challenge in both schools remains how to remains how to take these clusters forward and develop them into professional learning communities.

Emergence of these clusters is welcome because it provides opportunities for knowledge sharing among maths teachers. They provide platforms where teachers discuss curriculum issues, common assessments and other common instructional practices, both within and between schools. *It will however be illogical to ignore some challenges that are prevalent in some clusters. Firstly, inability by local networks and clusters to transform into professional learning*

communities. This simply means a shift from confining debates in clusters to curriculum compliance only. For example, discussions should be elevated to encompass broader epistemic debates that strive to shape the professional conduct of teachers.

Secondly, conducting clusters activities during school hours to undermine learners' contact time. Thirdly, stifling opportunities for constant debate and reflection on what educators expect from clusters. Encouraging debates could create opportunities where teachers honestly express their views and aspirations on how clusters could enhance their professional development. Questions relating to content challenges are often misconstrued as attempts to expose knowledge deficiencies of district officials. If not professionally conducted i.e. focused on purpose and outcomes, chances are that they will deteriorate into "talk shops" with no meaningful deliverables.

There should be deliberate attempts to recognise and positively engage with expert teachers in these clusters. The common trend however, was the isolation of expert teachers because they were perceived to be "threats" by politically appointed district officials. I noted with disappointment that one district official did not engage the services of the school teacher who was an external examiner for the National Department of Education in mathematics. I do not suggest that expert teachers should do the work for district officials but I suggest that their expertise should be tapped to benefit teachers within the district. According to Pont, Nusche and Hopkins (2008: 51), specialised expertise tends to develop in multiple sites as networks get better in what they do. *Networks and clusters will only get better if officials work closely with and acknowledge expert teachers in their clusters*.

Principals of high performing schools share and transfer best practice across the system. Sharing practice across the system augurs well with Hopkins' assertion that networks support improvement and innovation by enabling schools to collaborate on building curriculum diversity, extended services and professional support. They also develop a vision of education that is shared and owned well beyond individual school gates (2006:19). *However, these system leaders and their teachers should never be overburdened by the demands of underperforming schools, which mostly did not really want to put on the effort needed for change.*

5.2.2 Induction, coaching and mentoring

	Induction, coaching and mentoring
School A1: 3	There was evidence that the school had effective induction programme for newly qualified teachers.
School A2: 2	Ineffective induction programme that was confined to the first term only.
Key variable/s	• *Formalising induction and mentoring processes in schools.* School A1 had a system of "internal referrals" that sanctioned access for new teachers to mentorship and coaching services from a pool of experienced maths teachers. The principal of School A2 completely excluded herself from these processes as she claimed that it was the responsibility of various HoDs. This is a delegated role and she still remains accountable.
School B1: 2	No formalised and structured induction and mentorship programme.
School B2: 1	No evidence to support that the school had an effective induction programme.
Key variable/s	• *Formalising induction and mentoring processes in schools.* There was strong evidence in School B1 to support that induction and mentoring processes were implemented informally, however the processes were not fully integrated within the school system through formal processes. In School B2, responses were divergent and it appeared that, where these processes existed, they were fragmented.

Induction is about managing the transition between initial teacher education (ITE) and the first years in the profession. It involves providing the necessary support to assist the novice teacher develop a professional identity, and to further improve skills acquired at the university or college. If correctly implemented, the proportion of those leaving the profession after their early years of teaching is reduced, thereby improving the retention rates of teachers (http://en.wikipedia.org/wiki/Teacher_education: 2002)

Unfortunately, through the information gathered from three schools, induction, coaching and mentoring occurred accidentally and out of sheer coincidence. For the fact that these schools except school A1 did not have formal induction programmes invalidates participants' responses to mere speculations or opinions. Formal induction programmes clarify the roles of those

involved and make the induction process to be seamless. Organising mentoring into structured induction programmes helps to deal with challenges and threats to the natural collegiality among teachers (Little: 1990).

By working together, new teachers learn that teaching is a collegial practice that should not happen in "solitary confinement". This reminds me of an African adage that if you want to fly faster, fly alone but if you want to fly further join others. Coaching classroom practice, moving teacher training to the classroom, developing stronger school leaders and enabling teachers to learn from each other have been identified as effective interventions to achieve quality interactions, according to McKinsey & Co. (2007). Just like a bird teaching her chick to fly, the mentor as guided by the induction programme, knows exactly when to leave the protégé to fly on his/her own.

5.2.3 Teachers' sense of responsibility

	Teachers' sense of responsibility
School A1: 3	There was evidence that teachers proactively took responsibility for their own learning and professional development.
School A2: 3	There was evidence that teachers proactively took responsibility for their own learning and professional development.
Key variable/s	• *Teacher professional development activities that are classroom based.* In both schools, participants acknowledged that the acquisition of knowledge and skills better prepared them to meet learners' needs and fulfil their potentials.
School B1: 3	There was evidence that teachers proactively took responsibility for their own learning and professional development.
School B2: 1	There was evidence to confirm that teachers expected the department to train and develop them.
Key variable/s	• *Teacher professional development activities that are classroom based.* The majority of teachers in School B3 were furthering their studies and actively participated in clusters. Teachers at School B2 remained passive even though the evidence suggested that

	teachers had deficiencies in terms of subject and pedagogic content knowledge.

It is quite humbling to see how many teachers embarked on and strived for continuous improvement by furthering their studies. This indicated a quest for knowledge by teachers and showed an understanding that the contemporary classroom imperatives demand sophisticated and improved classroom practices. Whether this quest was motivated by a strong desire to see measurable improvements in learners' outcomes or by other factors such as financial rewards is another debate.

The National Policy Framework for Teacher Education and Development in South Africa (2007), among others, envisages ensuring that the current initiatives devoted to the professional development of teachers contribute more effectively and directly to the improvement of the quality of teaching. This poses a real challenge to teachers in guarding against what is termed "paper chase", referring to programmes that are not relevant to or do not effectively address and improve the teachers' subject and pedagogic content knowledge but which teachers pursue merely to gain further qualifications.

The perception that teachers' needs be developed by outside agencies while teachers are the passive recipients of such 'development' should be condemned in the strongest terms. We should envy the policies and practices in other knowledge professions that demand for continuous self improvement to earn credits to continue with your practice. The system for teachers to earn professional development points through SACE should be implemented and encouraged to acknowledge teachers' continuing professional development efforts. Teacher professional development should not be driven by coercion or policy imperatives but by their own desire and motivation to learn.

The challenge of professional development, which includes the upgrading of knowledge and skills of teachers, is to provide personal development which results in improved learner achievement. Of course, the simple logic dictates that if teachers know more, they should teach better.

The starting argument that motivates for the professional development of teachers is advanced by Bartell (2005: 61), that teachers should be viewed as highly competent and motivated individuals who are always willing to learn more and improve. They should be seen as active, knowledgeable and ready to learn rather than passive, deficient and resistant. They should take charge of their professional development as communities of thoughtful and reflective practitioners.

5.3 Internal accountability

5.3.1 Efficient use of data

	Efficient use of data
School A1: 3	There was evidence that teachers used analysed data to inform and improve teaching and learning.
School A2: 1	There was some evidence that teachers analyse data to design intervention and remedial programmes for underperforming learners, but this is a superficial process.
Key variable/s	• *Data analysis and improvement plans.* Data analysis in School A1 was comprehensive and allowed educators to reflect on their own practice as well. Data analysis in School A2 was shallow and incomplete that opportunities for teacher reflections were minimal.
School B1: 2	There was evidence that teachers analyse data to design intervention and remedial programmes for underperforming learners.
School B2: 2	There was evidence that teachers analyse data to design intervention and remedial programmes for underperforming learners.
Key variable/s	• *Data analysis and improvement plans.* Educators in both schools were satisfied to design intervention plans with little emphasis on reflection by teams. Learner' attitudes were viewed as sole contributors of underperformance.

In all school visited, participants unanimously agreed that data collected from all forms of assessments was analysed to assess the performance and achievement of learners. Again, this

could be attributed to policy imperatives of the NCS as prescribed in the Subject Assessment Guidelines. According to this policy, teachers are required to analyse the performance of learners, especially from formal assessment tasks that were coordinated by district or regional offices. These analyses should include school improvement plan (SIP) that outlined remedial interventions where learners did underperform. In some extreme cases, district official teams target worst performing schools and were visited on a regular basis.

The Department of Basic Education also provides an analysis of learner performance on each subject written in the National Senior Certificate. For example, qualitative analysis of learner performance in mathematics 2011 examinations results revealed that many errors have their origins in a poor understanding of the basics and foundational competencies taught in the earlier grades. This, according to the Department of Basic Education, was evident in concepts such as algebraic manipulation, factorisation, solution of equations and inequalities (DoE, Report on the NSC Examination. National Diagnostic Report on Learner Performance: 2011). *Unfortunately, these analyses, as in the case of schools, will not have desired impact on learner performance if well designed and meaningful intervention programmes are not implemented.*

Secondly, teachers should have a clear understanding of the philosophical background and purpose which inform assessment processes. While internal assessment plans that determine the frequency and type of assessments are an integral part of schooling, attempts should be made to improve teaching and learning based on data collated. This analysis should not focus on learners' attitudes only but should also involve reflections by teachers on their own classroom practices as well. Learners' misconceptions that are uncovered should be followed by correct and targeted feedback and remedial programmes.

Elmore (2008) perceives learner assessment as an integral part of teaching and learning that informs both teachers and learners about the progress and challenges during the learning process. Teachers use feedback from assessment activities to design remedial interventions for struggling learners. Formative assessment data should be very close to the instructional process and monitor the quality of instruction against some external standard of practice.

5.3.2 Collegial practice on assessment.

	Collegial practice on assessment.
School A1: 3	There were regular meetings that embraced collegial practices to discuss learner achievement and performance.
School A2: 1	Different opinions among participants regarding collegial practices and the frequency of meetings to discuss learner achievement and performance.
Key variable/s	• *Strong collegial practices for improved performance.* Teachers in School A1 collectively discussed the performance and achievement of learners, and collaboratively designed strategies for interventions. There was conflicting evidence of collegial practices on assessment in School A2.
School B1: 1	No agreement among participants on structured sessions to discuss learner achievement and performance.
School B2: 2	School had structured plan to conduct feedback sessions on internal assessment, however the plan was not consistently followed.
Key variable/s	• *Strong collegial practices for improved performance.* There was no evidence of collegial practices in meetings scheduled to discuss feedback on learner achievement and performance in School B1. School B2 had a structured session to discuss feedback on learner achievement and performance, unfortunately the plan did not included discussions on collegial practices

Even though there was evidence that data collected from various forms of assessments was analysed as discussed in the above section, collegial practices on assessment were still lacking except in School A1. The passive attitude of teachers to embrace collegial practices on assessment in particular could be traced back to the historical background within the profession. Previous education departments, especially in the homeland regimes did not foreground professional conduct and ethics as fundamental principles to the teaching profession.

Teachers should hold regular sessions to discuss learner achievement and performance, share assessment tools and strategies, and interrogate the merits of their remedial programmes. Collectively, they should generate common strategies to deal with student misconceptions and improve instruction to the next level. There should be deliberate and focused systems to assist educators to unlearn repertoires and habits that fostered individualism, and which can break silos in which most of them derive comfort and pleasure. Giving learners immediate feedback is also important for teachers to reflect on their own teaching practice.

Raudenbush (2009) notes that students display uniformly high levels of achievement when teachers collaboratively discuss performance of learners. In a collaborative situation, the teacher may summon the assistance of the expert or instructional leader to work closely with him/her. This means that the result of every learner is open to scrutiny and teachers will be motivated to promote high levels of learner achievement (Sammons: 2004).

5.3.3 Moderation of assessment

	Moderation of assessment
School A1: 3	There was evidence that the HoD moderated and gave feedback on all forms of assessment.
School A2: 3	There was evidence that the HoD moderated and gave feedback on all forms of assessment.
School B1: 2	There was evidence that the HoD moderated and gave feedback on all forms of assessment.
School B2: 3	Moderation was conducted by the senior teacher because the HoD was not appropriately qualified to moderate maths question papers.

The issue of moderation should be professionally managed because it is so sensitive and it can be clouded by elements of subjectivity as opposed to objectivity. In some cases, it can isolate the person responsible for moderation from the rest of the team because of clashes of personalities and issues of egos. Similarly to some promotions and appointments in education regional and district offices, some appointments to these positions (HoD) were not based on expertise and knowledge but on other questionable criteria such as gender equity. In School B2, the dominant union in that circuit pushed for the appointment of the female educator as HoD on grounds of gender equity against the will of the principal. That very same HoD could not moderate mathematics papers because she specialised in Physical Science and Life Science.

Management in functional schools is influenced more by expert power commanded by managers as opposed to legitimate power. Legitimate power refers to the authority associated with the post at which one is appointed. Managers who rely more on their legitimate power usually demand respect from their colleagues as compared to managers who earn respect because of their expertise and knowledge.

When differentiating schools with strong and weak accountability, Elmore (2004: 127) concludes as follows: Schools with weak internal accountability structures assign causality for their success or failure to forces outside their control: the learners, their families, the community, the "system". Schools with strong internal accountability assign causality for their success or failure to themselves: to the knowledge and skill they bring to their work, to the power of shared values, and to the capacities of their organisations. The very same criterion could be used to differentiate mathematics departments with strong accountability from those with weak accountability.

5.4 Conclusion

The findings of our 4 case studies support the work of Leithwood et al (2006), who articulate an informed and compelling conclusion on instructional leadership:

- Almost all successful leaders draw on the same repertoire of basic leadership practices.
- The ways in which leaders apply these basic leadership practices demonstrate responsiveness to, rather than dictation by, the contexts in which they work.
- School leaders improve teaching and learning indirectly and most powerfully through their influence on staff motivation, commitment and working conditions.
- School leadership has a greater influence on schools and students when it is widely distributed.
- Some patterns of distribution are more effective than others.

The table below helps to identify outstanding variables that set apart schools within a matched pair. I will use the table to speculate which of the eight school level practices were likely responsible for higher performance in School A1 relative to A2, and B1 relative to B2.

Rating Table

Factor		Indicator	School			
			High SES		Low SES	
			A1	A2	B1	B2
Performance		NSC results	High	Low	High	Low
School level activities	Instructional leadership	Management of curriculum	3	3	3	3
		Curriculum and pedagogy	3	1	1	1
	Continuing Professional Development	Networks and collaborations	3	2	2	2
		Induction, coaching and mentoring	3	2	2	1
		Teachers' sense of responsibility	3	3	3	1
	Internal accountability	Efficient use of data	3	2	2	1
		Collegial practice on assessment	3	1	1	1
		Moderation of assessment	3	3	1	2

Looking at School A1, which was able to increase the number of quality passes in mathematics and that had strong internal practices as evident in the ratings scored, I attribute higher performance in School A1 to two principal factors:

5.4.1 Curriculum and pedagogy

School A1 had regular meetings to discuss instructional practices and give feedback to staff members. Teachers in School A1 observed each other during lesson presentations and were not threatened by interclassroom partnership. Teachers assisted one another to teach challenging sections of the maths curriculum, thereby sharing both content and pedagogic knowledge. The maths department held meetings referred to as 'how to meetings' to discuss innovative methods of teaching, to discuss challenging topics and to provide teachers opportunities to present interesting topics or recent developments in mathematics. These practices were largely absent from A2, and we surmise that they are involved in the better performance of A1 compared to A2.

5.4.2 Collegial practice on assessment

The maths department in A1 discussed in depth the feedback of the data collated from formal assessment tasks. Teachers maintained that underperformance of learners could not be traced from learners' attitudes only, but from different variables including their own teaching practices. They embraced collegial practices on assessment whereby they sometimes conducted intervention programmes, designed remedial programmes together and even shared assessment tools and strategies. Such collegial practices on assessment were absent in A2.

Although the differences in rating for schools with low socio-economic status (B1 and B2) were generally not as strong compared to schools with high socio-economic status (A1 and A2), we infer that the following school level practices were implicated in the relatively better performance of B1 :

5.4.3 Induction, coaching and mentoring

In School B1, there was evidence that newly employed teachers were mentored by senior teachers. The evidence supplied by the junior teacher showed that something regarding the processes was happening. In School B2, newly qualified teachers where left on their own and this is reflected in the response supplied by the junior teacher.

5.4.4 Teachers' sense of responsibility

Teachers in School B1 were proactively taking charge for their own learning as witnessed in the number of educators furthering their studies and their motivation to attend cluster meetings. They are seen as active, knowledgeable and ready to learn. The opposite happened in School B2 where the expectation was that the department was supposed to train and develop them. These educators are seen to be passive, deficient and resistant.

5.4.5 Moderation of assessment

Something interesting emerged here. School B2 achieved a rating higher than School B1, even though the number of quality results declined in B2. We speculate that maths teachers in school

B2 might have been discouraged when they were not considered for promotion. As mentioned earlier the current incumbent was promoted on the grounds of gender equity against the will of the principal even though she did not have appropriate maths qualifications.

Even though we cannot generalise on the basis of four case studies, the value of this report is that we have developed:

- a scheme for describing and analysing school-level practices that facilitate and optimise teaching and learning, and
- a set of hypotheses for accounting for improved school performance.

In Chapter 6, we derive a set of tentative recommendations based on the above findings.

CHAPTER SIX

6. CONCLUSION

6.1 Framing the recommendations.

Four high schools matched in pairs, one pair of high socio-economic status and one pair of low socio-economic status, were selected from a total of 78 schools supported by the E & O Trusts. Within each pair, the schools differed by performance on the NSC examinations: one school was improving while the other was static or declining. The purpose of the research was to understand the school level factors for these performance patterns.

We started by identifying eight indicators, which according to the literature, are important in achieving highly effective processes of teaching and learning. These indicators are:

- Management of curriculum;
- Curriculum and pedagogy;
- Networks and collaborations;
- Induction, coaching and mentoring;
- Teachers' sense of responsibility;
- Efficient use of data;
- Collegial practice on assessment; and
- Moderation of assessment.

This chapter now pulls together a list of recommendations regarding school level activities (as distinct from the kind of pedagogical activities occurring in individual classrooms). In other words, we are looking at activities susceptible to improvement by school leadership. Schools that institutionalised some practices and systems as previously identified, were able to increase and maintain the number of quality passes in mathematics and as such, meeting the objectives of the donors. To some extent, the increase or decrease in the number of quality passes correlated with the degree to which these practices were internalised and embraced in the school. Hypotheses that developed from this study are presented as follows:

6.2 Instructional Leadership

6.2.1 Management of curriculum

The first thing to note about this indicator is that all four schools have strong curriculum management practices. This could mean that this is a key factor in ensuring that all four schools are relatively high performing, compared to other public schools in South Africa. It could also mean that we need to look at other factors to understand what is it that enables School A1 to outperform A2 and School B1 to outperform B2.

Principals are central to the management of curriculum in schools and if they dedicate more time and energy to ensure that there is effective teaching and learning, chances are that learner performance in their schools could be improved. However, understanding the complexity and the nature of schools will require more than the individual's endeavour to achieve this challenging leadership and management role. Fortunately, management structures in schools provide other levels of support to complement the principal i.e. the school management team. It will depend on the principal's capability and expertise to make sure that the team operates as a unit to realise and achieve the desired outcomes.

Distributing leadership and managerial roles to other members of the team is a powerful management strategy available to principals. It will be prudent of HoDs to ensure that there is effective planning, work allocation, curriculum coverage, monitoring of assessment and execution of other duties that support effective teaching and learning. If this happens, it becomes simple for principals to coordinate and monitor responsibilities delegated to HoDs, guarding against the risk of completely abdicating their responsibilities. In actual fact, they have to be closer to what is happening in classrooms.

6.2.2 Curriculum and pedagogy

It appeared across all four schools that teachers understand the importance of embracing collegial practices in addressing issues on curriculum implementation and improving teachers' subject and pedagogic content knowledge. However, teachers in three schools except in School

A1 still prefer to work in isolation. This may account for the reason why School A1 edges others in terms of learner achievement and performance.

Promoting these collegial practices will not happen accidentally or out of sheer coincidence but requires formal and structured programmes to drive them. HoDs will do more if they design programmes for lesson observations, team teaching and have feedback sessions for all teachers in their departments. Implementation of these programmes will assist teachers to internalise collegial practices, thereby reworking and reflecting on their classroom practices consistently. Schools could sometimes invite external experts for knowledge sharing and motivation.

6.3 Continuing professional development

6.3.1 Networks and collaborations

Most educators in all four schools participated in local clusters coordinated by district officials and some have affiliated to professional bodies such as AMESA. If teachers in the three schools that scored 2 could begin to discuss subject specific issues and issues on teachers' epistemic obligations in their clusters, they could be progressing towards creating professional learning communities. As with the case of School A1, discussions in clusters may include debates on teachers' professional conduct, their work ethics, content knowledge, etc., thereby elevating and transforming their clusters to the next level.

6.3.2 Induction, coaching and mentoring

Schools A2 and B1 seem to be making good progress towards strengthening induction, coaching and mentoring processes. Learners in these schools could perform better if their principals formalise these processes and make them effective like in School A1. The decline in learner achievement in School B2 could be attributed to the fact that the school employed two new and unqualified teachers who were allocated classes without proper induction and mentoring processes.

Mentoring is a formalised process that involves coaching and feedback sessions about the individual growth in the new career. It includes mutual setting of milestones and targets by both

parties that will enable them to assess and review the progress made. It has to be an explicit and transparent process that enables even the protégé to genuinely monitor and evaluate if the set targets are met or missed. We therefore recommend that schools design formal induction and mentoring processes that will promote collegial teaching practices to improve learner achievement and performance.

6.3.3 Teachers' sense of responsibility

If we agree that schools are complex and changing systems, and that employees are integral assets of any organisation, then there should be broader consensus that these assets should 'be developed' to keep pace with the changing environment. By implication, all employees, including teachers will benefit their organisations if they upgrade their qualifications in order to improve their knowledge and practice. For teachers however, it becomes a problem when the curricula for upgrading or furthering their qualifications make very little effort to address classroom practice.

Again, looking at the table in Chapter 5, teachers' sense of responsibility could be a key factor that ensured relatively high performance in the three schools compared to School B2. It will be ideal if teachers see themselves as competent and motivated individuals, who take their own initiatives instead of waiting for the department to develop them. We often hear teacher unions lamenting that the Department of Basic Education is failing to train teachers but we don't hear more on what teachers are doing to learn more and improve themselves.

6.4 Internal Accountability

6.4.1 Efficient use of data

It is encouraging to note that teachers in all schools use data collected from various forms of assessment to analyse the performance and achievement of learners. What differentiated School A1 from the rest, is encapsulated in the manner teachers in School A1 interact with the analysed data to improve their classroom practices. This could also provide an explanation why School A1 as compared to other schools, improved the quality of learner results in mathematics.

The design of intervention programmes and remedial strategies to assist underperforming learners is recommended but what remains crucial is whether teachers genuinely implement these programmes or just design them for submission to district offices. It is incomplete and unbalanced to always attribute poor performance solely on learners' attitudes or apportion blame to other variables that exclude self introspection. Sometimes, it could be the teachers' approach that impedes learners' abilities to practically comprehend certain concepts.

6.4.2 Collegial practice on assessment

In School A1, teachers collaboratively worked towards understanding the overall performance of the whole maths department after analysing and collating data from formal assessment tasks. The current levels of achievement in the other three schools might manifest learners' cumulative knowledge gaps which could be addressed properly by teachers' collegial practices on assessment. Fragmented and uncoordinated intervention strategies will not address the root causes of underperformance but superficially scratch the surface and address the prevalent symptoms of the problem.

Teachers may consider hosting parents evenings quarterly to update parents about their learners' progress and together, they may discover that learners need psychological support to cope with their school work. Of importance, teachers should start to think of proactive strategies that are integrated within their daily lesson plans to improve the performance of learners.

6.4.3 Moderation of assessment

According to participants in all schools, HoDs were responsible for moderation of all internal assessment tasks excluding common tasks which were set and moderated at district level. In most cases, HoDs were guided by taxonomies to allocate marks according to the nature and complexity of questions. In school B1, the appointment of the HoD who is not a maths specialist might have had an adverse impact on the morale of teachers, and consequently on learner performance as well.

Moderation of formal assessment tasks should be informed by transparent and objective tools and measures. As such, people appointed to this post level should be matured and refrain from using their legitimate positions to settle personal grudges. Secondly, appointment to this post level should be based on and informed by the knowledge and expertise the candidate command. Her/his major role is to make sure that teachers within the department are treated uniformly and work as team.

In conclusion, as earlier mentioned at the beginning of this chapter, schools that institutionalised some practices and systems were able to increase and maintain the number of quality passes in mathematics. We therefore, conclude that if teachers and principals internalise such school level practices could lead to improved learner performance and achievement. The factors which appear to hold the most potential for optimising performance in the two high SES former Model C schools are collegial practices on curriculum, pedagogy and assessment. In the two low SES former DET schools performance advantage seems to be enhanced by the systematic use of assessment data and by an increased sense of responsibility on the part of teachers.

References

1. Adler, J. and Reed, Y. (2002). *Challenges of teacher development: An investigation of take-up in South Africa*. Pretoria: Van Schaik Publishers.

2. Bassey, M. (1999). *Case Study in Educational Settings*. Philadelphia and Buckingham: Open University Press.

3. Berman, P. and McLaughlin, M. (1974). *Federal programs supporting educational change, Vol. 1: A model of educational change.* Santa Monica, CA: Rand Corporation.

4. Centre for Education Policy Development. (2008). *Teacher Education Research and Development Programme Conference*. Braamfontein: CEPD.

5. Chell, J. (2011). Introducing Principals to the role of Instructional *Leadership: A summary of a master's project*. SSTA Research Centre Report. http://www.saskschoolboards.ca/reseach/leadership/95-14.htm.

6. Christie, P. (2008). *Changing schools in South Africa: Opening the Doors of Learning. Johannesburg*: Heinemann.

7. Christie, P., Butler, D. And Potterton, M. (2007). *Schools that work*. Report to the Minister of Education of the Ministerial Committee. Pretoria: Department of Education.

8. Cohen, L., Manion, L. and Morrison, K. (2000). *Research methods in Education (5th ed.).* London: Routledge Falmer.

9. Department of Education. (2002b). *Grade 3 National Systemic Evaluation Report*. Pretoria: DoE.

10. Department of Education. (2006). *National Policy Framework for Teacher Education and Development in South Africa: "More teachers; Better Teachers".* Pretoria: DoE.

11. Department of Education. (2009). *Report on the National Senior Certificate Results*. Pretoria: DoE.

12. Department of Education. (2011). *Report on the 2011 National Senior Certificate Examination*. National Diagnostic Report on Learner Performance. Pretoria: DoE.

13. Education Labour Relations Council. (2009). Resource Documents: *Teacher Development Summit.* Centurion: ELRC.

14. Elmore, R. (2008). Leadership as the practice of improvement. In Pont, B.; Nusche, D. and Hopkins, D. (eds.): *Improving School Leadership: Case Studies on System Leadership*. OECD, Volume 2.

15. Fleisch, B. (2002). *Managing Educational Change: State and School Reform in South Africa.* Johannesburg: Heinemann. Chapter 5.

16. Fleisch, B. (2008). Primary Education in Crisis: *Why South African schoolchildren underachieve in reading and mathematics*. Cape Town: Juta.

17. Flyvbjerg, B. (2006). Qualitative Inquiry. *Five Misunderstandings about Case-Study Research.* SAGE: http://qix.sagepub.com/content/12/2/219.

18. Fullan, M. (1991). *New Meaning of Educational Change*. NY: Teachers College Press.

19. Gilgun, J. (2011). Coding in Deductive Qualitative Analysis. *Current Issues in Qualitative Research*, An Occasional Publication for Field Researchers from a Variety of Disciplines. Volume 2 (1). http://www.scribd.com/doc/47331325/Coding-in-Deductive-Qualitative-Analysis .Downloaded 27 Sept 2011.

20. Harding, J. (2006). *Structured Freedom: Successful Schools Through Collaborative Learning Communities*. In Stone, R. (ed): Best Practices for Teacher Leadership. California: Corwin Press.

21. Hargreaves, A. and Fullan M., (1992). *Understanding Teacher Development*. New York: Teachers College Press.

22. Hargreaves, A. and Shirley, D. (2007). The Coming Age of Post-Standardisation. *Education Week,* December 21.

23. Hoadley, U., Christie, P. And Ward, C. (2008). *Managing to learn: Instructional Leadership in South African Secondary Schools*. Pretoria: HSRC Press.

24. Hopkins, D. (2006). *Every School a Great School: Meeting the Change of Large Scale, Long Term Reform*. University of London.

25. Howie, S., Venter, E., van Staden, S., Zimmerman, L., Long, C., Scherman, C., and Archer, E. (2007). PIRLS 2006 Summary Report: *South African children's reading achievement*: Pretoria: University of Pretoria. Centre for Evaluation and Assessment.

26. Jansen, J. (1995). Effective schools? *Comparative Education,* 31: 181-200.

27. Kanjee, A. (2007). *Improving learner achievement in schools: Applications of national assessments in South Africa*. In Buhlungu, S., Daniel, J., Southall, R. And Lutchman, J. (Eds.). State of the Nation: South Africa 2007. Cape Town: HSRC Press.

28. Lee, V., Zuze, T. and Ross, K. (2005). School Effectiveness in 14 Sub-Saharan African Countries. *Studies in Educational Evaluation,* 31: 207-246.

29. Lim, Y. and Odom, W. (2009). *On the importance of framing questions for user research in the experience-centred design process.* Boston, MA, USA: ACM 978-1-60558-246-7/08/04.

30. Little, J. (1990). Teacher Professional Development in a Climate of Education Reform. *Educational Evaluation and Policy Analysis,* 15: 129-151.

31. McKinsey & Co. (2007). *How the world's best-performing school system come out on top*. http://www.mckinsey.com/clentservice/socialsector/resources/pdf/worlds school system final pdf.

32. McMillan, J. and Schumacher, S. (2010). *Research in Education: Evidence-Based Theory (7th ed.)*. New Jersey: Pearson Education, Inc.

33. Miles, M. (1964). Education Innovation: the nature of the problem in Miles, M. *Education Innovation in Education*. New York: Teachers College Press.

34. Miles, M and Huberman, A. (1994). *Qualitative Data Analysis. Thousand Oaks*, Ca: Sage Publications.

35. Opdenakker, R. (2006). Forum: Qualitative Social Research. *Advantages and Disadvantages of Four Interview Techniques in Qualitative Research.* Volume 7 (4). http://www.qualitative-research.net/index.php/fqs/article/view/175/391.

36. Patton, M. (2002). *Qualitative Research and Evaluation Methods*. Thousand Oaks, Ca: SAGE.

37. Raudenbush, S. (2009). The Brown Legacy and the O'Connor Challenge: Transforming Schools in the Images of Children's Potential. *Educational Researcher*, 38: 169.

38. Slavin, R. (2005). Sand, bricks and seeds: *school change strategies and readiness for reform.* In Hargreaves, A (ed): Extending Educational Change. Springer.

39. Sammons, P. (2004). School Effectiveness and Equity: Making the Connections. *A review of the school effectiveness and improvement research – its implications for practitioners and policy makers.* CfBT Education Trust.

40. Sarason, S. (1971). *The Culture of the School and the Problem of Change*. Allyn & Bacon. Chapter 4.

41. Shenton, A. (2004). *Strategies for ensuring trustworthiness in qualitative research projects*. Newcastle: Northumbria University, UK.

42. Spillane, J. (2006). *Distributed leadership.* Jossey-Bass: San Francisco

43. Taylor, N. (2006). Schools, skills and citizenship. *JET Bulletin no. 15: Focus on Challenges across the Education Spectrum*. Johannesburg: Joint Education Trust.

44. Taylor, N., Mabogoane, T. and Akoobhai, B. (2011). *The School Sector*. Service Delivery Research Project of the Office of the Presidency. Johannesburg: Joint Education Trust.

45. Taylor, N. and Vinjevold, P. (Eds) (1999). Getting Learning Right: *Report of the President's Education Initiative Research Report*. Johannesburg: Joint Education Trust.

46. Wildy, H. And Dimmock, C. (1993). *Instructional leadership in primary and secondary schools in Western Australia*. Journal of Educational Administration, 31(21), 43-61.

APPENDIX A

	INTERVIEW SCHEDULE Interview with the Principal			
1.1	Date	Day	Month	Year
1.2	Name of School			
1.3	Name of Principal	First Name	Surname	
1.4	Years of teaching experience			
1.5	Present teaching subjects			
1.6	Qualifications	Highest Academic Qualification	Name of institution	
1.7	Contact Details	Email address:	Cell no:	
CONFIDENTIALITY Please sign below to indicate your consent to the confidentiality agreement		I understand that this interview will be treated as confidential. I understand that neither my name nor the name of the school will be used in the written report.		
SIGNATURE				

2. Instructional leadership

2.1. What do you see as your main tasks as principal?
2.2. How do you understand the term ‘curriculum leader’ or instructional leader?
2.3. What are the main tasks of the school’s instructional leader?
2.4. Evaluate the management of your school curriculum.

…… …… ……		
2.5. Does the SMT support effective classroom teaching?		
2.6. If yes, how is this done?		
2.7. Who does it?		
2.8. Does your SMT promote interclassroom partnerships?	YES	NO
2.9. If yes, what form/forms does take? Tick as applicable below.		
Informal discussions on teaching matters in the staffroom.	Regular meeting on curriculum issues	Team teaching
2.10. Are teachers encouraged to experiment innovative practices?	YES	NO
2.11. Why/Why not? …… …… ……		
2.12. What kind of networks/collaborations are you involved in? …… …… ……		
2.13. What is your role in those networks/collaborations? ……..... …… ……		
2.14. What is the value of those networks/collaborations to your school? …… …… ……		

3. Continuing professional development

3.1. Define professional teacher development. …… …… ……....		
3.2. Does your school support professional development of teachers?	YES	NO
3.3. Explain how? …… …… ……		
3.4. Does the school have a structured programme for professional teacher development?	YES	NO
3.5. Why/Why not? ……... …… ……		

3.6. In which professional development activities are teachers involved? …… …… ……
3.7. How do they (activities) contribute to the core business of the school? …… …… …….....
3.8. How were you supported as a newly qualified educator/ How do you support other educators? ……... …… ……..
3.9. Rate your school teachers in terms of subject content knowledge.

Excellent	Good	Average	Poor

3.10. How can teachers be supported through professional development to deepen content and pedagogical knowledge? …… …… ……..
3.11. What does your school need to create conditions for a supportive environment for teacher development? …… …….....

4. Internal Accountability

4.1. Does your school have a focused programme for internal assessment?	YES	NO
4.2. If yes, describe the programme.		
4.3. Do teachers use data collected from different forms of assessment to improve their teaching practice?	YES	NO
4.4. Describe how it happens?		
4.5. Should learner performance be used to identify teacher development needs?	YES	NO
4.6. Why/why not? ……... …… ……..		
4.7. How often do you discuss feedback on learner assessment?		
4.8. What happens to the outcome of these discussions?		
4.9. How do you accommodate learners with different learning abilities in setting various forms of assessment?		

Thanks for your participation.

APPENDIX B

Participation Information Sheet

To: ……

I, Madisha Edwin Mohlopi, a registered student at the University of the Witwatersrand (Student no. 9908458T), cordially invite you to participate in the research study for my postgraduate studies (Master Degree in Education). As the current recipient (your school) of the Epoch and Optima Trusts funds that support maths initiatives in schools across South Africa, your participation in this study cannot be overemphasised. The study attempts to answer this question: What activities are principals and teachers in schools supported by the Epoch and Optima Trusts undertaking, which contribute to achieving the aims of the programme? It is envisaged that the outcomes of the study will assist schools to strengthen their systems on curriculum planning and management.

Standardised open-ended interviews will be used as a primary instrument to gather data (see attached interview schedule). As a participant, you should be assured that the research question will always remain secondary to your well-being and confidentiality/anonymity is guaranteed (refer to the attached interview schedule for relevant clause). While acknowledging that interviews inherently intrude into your life in terms of time, the researcher will consciously avoid circumstances that will perpetrate abuse or make mistakes of real consequences. After completion of the research study, data gathered through interview schedules will be completely destroyed.

Please, take note of the following statements with regard to your participation in the study:

(a) Your participation is voluntary, and refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled;
(b) You may discontinue participation at any time without penalty or loss of benefits;
(c) It is not in the interest of the researcher to directly or indirectly cause any harm, either physically, emotionally or psychologically; and
(d) A hard copy of a Research Report will be furnished to the school upon completion of the study if requested.

The interview will last for an hour and will be conducted after school hours or during breaks. You are encouraged to answer questions openly and honestly without fear or coercion.

Signature of participant: …….
Signature of researcher: …….
Date: ……
Telephone: 011 544 0336
Cellphone: 082 976 1797

APPENDIX C

Analysis of learners' performance

1

	Low	High	Total
2009	12	103	**115**
2010	35	80	**115**
Total	**47**	**183**	**230**

2

	Low	High	Total
2009	14	58	**72**
2010	42	79	**121**
Total	**56**	**137**	**193**

3

	Low	High	Total
2009	42	101	**143**
2010	66	109	**175**
Total	**108**	**210**	**318**

4

	Low	High	Total
2009	11	34	**45**
2010	5	40	**45**
Total	**16**	**74**	**90**

5

	Low	High	Total
2009	39	52	**91**
2010	46	54	**100**
Total	**85**	**106**	**191**

6

	Low	High	Total
2009	11	96	**107**
2010	15	77	**92**
Total	**26**	**173**	**199**

7

	Low	High	Total
2009	142	38	**180**
2010	148	43	**191**
Total	**290**	**81**	**371**

8

	Low	High	Total
2009	16	149	**165**
2010	15	136	**151**
Total	**31**	**285**	**316**

9

	Low	High	Total
2009	57	63	**120**
2010	26	49	**75**
Total	**83**	**112**	**195**

10

	Low	High	Total
2009	137	50	**187**
2010	106	33	**139**
Total	**243**	**83**	**326**

11

	Low	High	Total
2009	67	72	**139**
2010	84	50	**134**
Total	**151**	**122**	**273**

12

	Low	High	Total
2009	1	86	**87**
2010	2	96	**98**
Total	**3**	**182**	**185**

13

	Low	High	Total
2009	106	63	**169**
2010	147	33	**180**
Total	**253**	**96**	**349**

14

	Low	High	Total
2009	91	58	**149**
2010	90	63	**153**
Total	**181**	**121**	**302**

15

	Low	High	Total
2009	57	96	**153**
2010	23	89	**112**
Total	**80**	**185**	**265**

16

	Low	High	Total
2009	30	77	**107**
2010	12	81	**93**
Total	**42**	**158**	**200**

17

	Low	High	Total
2009	76	70	**146**
2010	27	38	**65**
Total	**103**	**108**	**211**

18

	Low	High	Total
2009	51	46	**97**
2010	113	59	**172**
Total	**164**	**105**	**269**

19

	Low	High	Total
2009	27	65	**92**
2010	26	70	**96**
Total	**53**	**135**	**188**

20

	Low	High	Total
2009	47	48	**95**
2010	21	37	**58**
Total	**68**	**85**	**153**

21

	Low	High	Total
2009	85	58	**143**
2010	35	56	**91**
Total	**120**	**114**	**234**

22

	Low	High	Total
2009	65	44	**109**
2010	60	47	**107**
Total	**125**	**91**	**216**

23

	Low	High	Total
2009	47	131	**178**
2010	57	111	**168**
Total	**104**	**242**	**346**

24

	Low	High	Total
2009	9	30	**39**
2010	10	35	**45**
Total	**19**	**65**	**84**

25

	Low	High	Total
2009	13	24	**37**
2010	15	28	**43**
Total	**28**	**52**	**80**

26

	Low	High	Total
2009	67	95	**162**
2010	71	98	**169**
Total	**138**	**193**	**331**

27

	Low	High	Total
2009	47	13	**60**
2010	65	15	**80**
Total	**112**	**28**	**140**

28

	Low	High	Total
2009	158	52	**210**
2010	212	65	**277**
Total	**370**	**117**	**487**

29

	Low	High	Total
2009	17	34	**51**
2010	60	42	**102**
Total	**77**	**76**	**153**

30

	Low	High	Total
2009	53	102	**155**
2010	68	62	**130**
Total	**121**	**164**	**285**

31

	Low	High	Total
2009	75	53	**128**
2010	80	56	**136**
Total	**155**	**109**	**264**

32

	Low	High	Total
2009	76	86	**162**
2010	114	79	**193**
Total	**190**	**165**	**355**

33

	Low	High	Total
2009	74	38	**112**
2010	125	29	**154**
Total	**199**	**67**	**266**

34

	Low	High	Total
2009	53	118	**171**
2010	50	134	**184**
Total	**103**	**252**	**355**

35

	Low	High	Total
2009	49	168	**217**
2010	115	212	**327**
Total	**164**	**380**	**544**

36

	Low	High	Total
2009	22	77	**99**
2010	32	62	**94**
Total	**54**	**139**	**193**

37

	Low	High	Total
2009	39	34	**73**
2010	89	57	**146**
Total	**128**	**91**	**219**

38

	Low	High	Total
2009	105	31	**136**
2010	0	32	**32**
Total	**105**	**63**	**168**

39

	Low	High	Total
2009	67	11	**78**
2010	61	26	**87**
Total	**128**	**37**	**165**

40

	Low	High	Total
2009	38	47	**85**
2010	31	34	**65**
Total	**69**	**81**	**150**

41

	Low	High	Total
2009	48	27	**75**
2010	52	36	**88**
Total	**100**	**63**	**163**

42

	Low	High	Total
2009	56	94	**150**
2010	93	58	**151**
Total	**149**	**152**	**301**

43

	Low	High	Total
2009	21	27	**48**
2010	26	31	**57**
Total	**47**	**58**	**105**

44

	Low	High	Total
2009	40	49	**89**
2010	26	74	**100**
Total	**66**	**123**	**189**

45

	Low	High	Total
2009	29	85	**114**
2010	30	78	**108**
Total	**59**	**163**	**222**

46

	Low	High	Total
2009	14	160	**174**
2010	31	119	**150**
Total	**45**	**279**	**324**

47

	Low	High	Total
2009	13	127	**140**
2010	23	120	**143**
Total	**36**	**247**	**283**

48

	Low	High	Total
2009	36	82	**118**
2010	22	70	**92**
Total	**58**	**152**	**210**

49

	Low	High	Total
2009	94	54	**148**
2010	81	34	**115**
Total	**175**	**88**	**263**

50

	Low	High	Total
2009	53	29	**82**
2010	39	26	**65**
Total	**92**	**55**	**147**

51

	Low	High	Total
2009	37	96	**133**
2010	43	99	**142**
Total	**80**	**195**	**275**

52

	Low	High	Total
2009	54	204	**258**
2010	35	210	**245**
Total	**89**	**414**	**503**

53

	Low	High	Total
2009	29	185	**214**
2010	45	164	**209**
Total	**74**	**349**	**423**

54

	Low	High	Total
2009	29	50	**79**
2010	35	79	**114**
Total	**64**	**129**	**193**

55

	Low	High	Total
2009	57	35	**92**
2010	62	45	**107**
Total	**119**	**80**	**99**

56

	Low	High	Total
2009	9	130	**139**
2010	15	113	**128**
Total	**24**	**243**	**267**

57

	Low	High	Total
2009	71	34	**105**
2010	77	28	**105**
Total	**148**	**62**	**210**

58

	Low	High	Total
2009	15	67	**82**
2010	11	63	**74**
Total	**26**	**130**	**156**

59

	Low	High	Total
2009	79	49	**128**
2010	152	42	**194**
Total	**231**	**91**	**322**

60

	Low	High	Total
2009	24	80	**104**
2010	83	69	**152**
Total	**107**	**149**	**256**

61

	Low	High	Total
2009	32	50	**82**
2010	11	68	**79**
Total	**43**	**118**	**161**

62

	Low	High	Total
2009	81	85	**166**
2010	0	69	**69**
Total	**81**	**154**	**235**

63

	Low	High	Total
2009	18	94	**112**
2010	32	77	**109**
Total	**50**	**171**	**221**

64

	Low	High	Total
2009	32	57	**89**
2010	16	41	**57**
Total	**48**	**98**	**146**

65

	Low	High	Total
2009	45	78	**123**
2010	48	72	**120**
Total	**93**	**150**	**243**

66

	Low	High	Total
2009	13	49	**62**
2010	25	34	**59**
Total	**38**	**83**	**121**

67

	Low	High	Total
2009	18	86	**104**
2010	39	66	**105**
Total	**57**	**152**	**209**

68

	Low	High	Total
2009	30	26	**56**
2010	72	21	**93**
Total	**102**	**47**	**149**

69	Low	High	Total
2009	86	153	**239**
2010	73	125	**198**
Total	**159**	**278**	**437**

70

	Low	High	Total
2009	53	84	**137**
2010	106	84	**190**
Total	**159**	**168**	**327**

71

	Low	High	Total
2009	72	39	**111**
2010	34	56	**90**
Total	**106**	**95**	**201**

72

	Low	High	Total
2009	27	36	**63**
2010	70	33	**103**
Total	**97**	**69**	**166**

73

	Low	High	Total
2009	41	36	**77**
2010	44	33	**77**
Total	**85**	**69**	**154**

74

	Low	High	Total
2009	0	126	**126**
2010	0	132	**132**
Total	**0**	**258**	**258**

75

	Low	High	Total
2009	26	125	**151**
2010	17	147	**164**
Total	**43**	**272**	**315**

76

	Low	High	Total
2009	39	80	**119**
2010	42	68	**110**
Total	**81**	**148**	**229**

77

	Low	High	Total
2009	40	73	**113**
2010	55	76	**131**
Total	**95**	**149**	**244**

78

	Low	High	Total
2009	14	103	**117**
2010	24	81	**105**
Total	**38**	**184**	**222**

APPENDIX D

Sampling table

Schools	Classification of performance (High and Low)	Former Department (HAI/HDI)	Selected
1	High	HAI	No
2	High	HDI	No
3	High	HAI	No
4	High	HDI	No
5	High	HAI	No
6	High	HAI	No
7	Low	HDI	No
8	High	HAI	No
9	High	HDI	No
10	Low	HDI	No
11	Low	HAI	No
12	High	HAI	No
13	Low	HAI	No
14	Low	HDI	No
15	High	HAI	No
16	High	HAI	No
17	Low	HDI	No
18	Low	HDI	No
19	High	HDI	No
20	High	HDI	No
21	Low	HAI	No
22	Low	HAI	No
23	High	HDI	No
24	High	HAI	No
25	High	HAI	No
26	High	HAI	No
27	Low	HDI	Yes
28	Low	HDI	No
29	Low	HDI	No
30	High	HAI	No
31	Low	HAI	Yes
32	Low	HDI	No
33	Low	HDI	No
34	High	HAI	No
35	High	HDI	No
36	High	HDI	No
37	Low	HDI	No

38	Low	HDI	No
39	Low	HDI	No
40	Low	HAI	No
41	Low	HDI	No
42	Low	HAI	No
43	High	HAI	No
44	High	HAI	No
45	High	HAI	No
46	High	HAI	Yes
47	High	HAI	No
48	High	HAI	No
49	Low	HAI	No
50	Low	HDI	No
51	High	HAI	No
52	High	HAI	No
53	High	HAI	No
54	High	HAI	No
55	Low	HAI	No
56	High	HAI	No
57	Low	HAI	No
58	High	HAI	No
59	Low	HDI	No
60	High	HDI	No
61	High	HDI	No
62	High	HDI	No
63	High	HDI	No
64	High	HAI	No
65	High	HDI	No
66	High	HDI	No
67	High	HAI	No
68	Low	HDI	No
69	High	HDI	Yes
70	Low	HAI	No
71	Low	HAI	No
72	Low	HDI	No
73	Low	HDI	No
74	High	HAI	No
75	High	HAI	No
76	High	HAI	No
77	High	HDI	No
78	High	HAI	No