Interpreting the effects of collegiality and collaboration on mathematics teachers' efficacy in a school based professional development programme: A case study

by
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Declaration

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Abstract

This study is a tale untold by quantitative data. The main role-players in this tale are two mathematics teachers at an urban high school situated in a low socio-economic area and involved in a professional development programme in the Western Cape, viz. the SPARK project. It is a case study of how their levels of collegiality and collaboration positively influenced their levels of efficacy, whilst being part of an in-service professional development programme. This interpretive qualitative case study is explored using two data sets: one being the classroom observation reports generated via participant observation during the first three years of the project; and the other is a focus group interview done three years later. The data sets were analysed to produce a rich, thick descriptive and interpretive account of the supportive environment of these two teachers and how it played a significant role in their professional growth and levels of efficacy. The findings of this study are then used to highlight the importance of establishing collaborative cultures within in-service professional development programmes and the positive influence it can have on the efficacy levels of teachers.

Opsomming

Hierdie studie vertel ‘n verhaal waaraan kwantitatiewe data alleen nie reg kan laat geskied nie. Die hoofrolspelers in die verhaal is twee wiskunde onderwysers by ’n stedelike hoërskool wat geleë is in ’n lae sosio-ekonomiese gebied en wat betrokke is by ’n professionele ontwikkelingsprogramme in die Wes-Kaap, die sogenaamde SPARK projek. Dit is ’n gevallestudie wat aantoon hoe hulle vlakke van kollegialiteit en samewerking, terwyl hulle deel was van hierdie professionele indiens-ontwikkelingsprojek, hulle vlakke van doeltreffendheid positief beïnvloed het. Hierdie interpretatiewe kwalitatiewe gevallestudie is ontleed aan die hand van twee datastelle: aan die een kant die klaskamer waarnemingsverslae gebaseer op klasobservasies van die deelnemers gedurende die eerste drie jaar van die projek en aan die ander kant ‘n fokusgroep onderhoud wat drie jaar later gedoen is. Die analise van hierdie datastelle het ’n ryklik gelaaide beskrywende en interpretatiewe weergawe daargestel van die ondersteunende omgewing van hierdie twee onderwysers en hoe dit ’n beduidende rol gespeel het in hulle professionele groei, onder meer hulle vlakke van werkseffektiwiteit. Die bevindings van hierdie studie word dan gebruik om die belangrikheid van die vestiging van kollaboratiewe kulture in professionele indiensopleidingsprogrammeme te beklemtoon. Die studie onderskryf ook die positiewe invloed wat ’n kultuur van samewerking kan hê op die doeltreffendheidsvlakke van onderwysers.

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I dedicate this thesis to my mother Ms K Jeram and late father Mr D Jeram.
Thanks for all your love, support and encouragement.
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CHAPTER 1

INTRODUCTION

Background and rationale for the study

I have worked as a facilitator for 9 years on various professional development programmes (PDP) focussing on in-service training for teachers. This exposed me to much of the curricula changes happening within teaching; some good but most of them perplexing to teachers. Most of the changes within the curriculum were based on sound teaching theories but the implementation, on the part of the National Education Department, was poor and the execution thereof became confusing for teachers. Many teachers were not prepared to embrace the changes while others, mostly the stalwarts, were disinterested. One reason was that teachers saw these changes as being foisted upon them with no consultation or consideration for the current challenges they were facing in the classroom. In 1995 the educational landscape was changing rapidly with the onset of curriculum 2005 and the National Curriculum Statement. Then two years later they saw the implementation of the Revised National Curriculum Statement; a moving away from a behaviourist teacher-centred approach to a more constructivist' learner-centred approach with which teachers were not fully au fait. The curriculum was changing at such a rapid pace that there was not enough time for teachers to adapt to these changes. Thus began the implementation of various PDP's within schools and funded by private donors and government education departments to assist teachers in dealing with these pedagogical changes. This thesis is based on a study done on one such project at one of the participating schools with a certain group of mathematics teachers.

The SPARK project was an in-service professional development programme (PDP). It started in January 2007 and the first phase of the project ended in December 2009. With additional funding it was extended by a further two years, ending finally in December 2011. The project took a holistic approach in that it provided funding to offer support to teachers teaching mathematics, physical science and English in the Further Education and Training (FET) band of the school system, i.e. offering support to teachers teaching these subjects in grades 10 to 12.

The focus of this study is concentrated over two phases. The first phase involved the author in the role of facilitator, whilst working on the project from 2007 to 2009 at one of five schools involved in the project and with two mathematics teachers. The second phase involved the author in the role of researcher, whilst conducting the study in 2012. Reasons for concentrating this study at one school with one group of mathematics teachers over the first three years are outlined further within this study.

My journey with this pair of mathematics teachers over the first three years is what motivated this study. This school produced the most consistent improvement in mathematics results of all five project schools during the duration of the project. Each school was exposed to the same number of content driven workshops, the same number of classroom visits and cluster meetings. The schools were also situated within a 5km radius of each other, situated within the same socio-economic area and are urban schools facing the same challenges, such as gangsterism, poverty, and poor housing.

The initial question was thus: What were these teachers doing differently and how did this impact on their teaching? One noticeable observation mentioned in the classroom observation reports generated by the facilitator(s) working on the project, was that these teachers had a very close working relationship. The intensity of the working relationship was noticeably more pronounced than the teachers at the other project schools. I decided to concentrate on the levels of collegiality and collaboration between these teachers to determine whether this was a contributing factor to their success. This study sets out to provide evidence of this whilst they participated on a PDP.

Gamoran et al (2000, pg.53) states that professional development has the ability to affect changes in teaching and learning at schools and serve as a stimulus to affect change throughout the school. Professional development can affect change in the organisational resources at schools in two ways; firstly it can add to the knowledge and skills of the teachers, i.e. the human resources and, secondly, it can contribute to the social resources, i.e. it can lead to the establishment of professional learning communities by encouraging the establishment of collaborative cultures at schools, promoting shared values and reflective discussions amongst teachers (Gamoran et al, 2000, pg.52).

Vukelich and Wrenn (cited in Bayrakci, 2009, pg.11) also state that in-service training for teachers should, inter alia, "help participants develop collaborative relationships and encourage participants to reflect on their teaching". Research is thus showing evidence of the importance of establishing collaborative cultures at schools via PDP's because it encourages reflective practices, shared values, shared or deprivatised practice (Gamoran et al, 2000) and helps to empower teachers and rationalise the workload of teaching by sharing resources (Abrahams, 1997). Research done on PDP's provides evidence that the establishment of collaborative cultures at schools can lead to the development of the teacher(s) and development, as opposed to training, focuses on the process of reflection, personal and professional growth of the teacher leading to positives changes in their teaching and learning, i.e. the efficacy levels of teachers (Bayrakci, 2009).

Purpose and research questions

As the idea is to describe and interpret the levels of collegiality amongst the mathematics teachers, this study will use a qualitative interpretivist research approach within a case study design. Further evidence of the qualitative nature of this research is provided by the methods of data collection and analysis. The data to be used was collected via participant observation and a focus group interview. Data analysis will be done using narrative inquiry, whereby the researcher will be reconstructing narratives from the stories of the participants involved in this study. These narrative reconstructions will serve as inquiry into the phenomenon being studied, viz. the levels of collegiality and collaboration amongst mathematics teachers and the influence it has on their levels of efficacy.

The research questions are:

1. How have the levels of collaboration influenced the classroom teaching and practices of the teachers whilst being part of an in-service professional development programme?

2. How have the levels of collegiality influenced the efficacy of the teachers whilst being part of an in-service professional development programme?

This study will unfold with a literature review chapter, highlighting the current research on the role that collaborative cultures can play on the efficacy levels of teachers within the professional development context. The next chapter focuses on the research design and methods that will be employed in this study to unearth the evidence needed to answer the research questions. The following chapter is the data analysis chapter, in which the researcher will analyse the data to provide the evidence to answer the research questions. This study will end with the conclusion which will summarize the main findings, discuss the implications of this study within the context of professional development and teacher efficacy and explore opportunities for further studies about the phenomenon under study.

CHAPTER 2

LITERATURE REVIEW

Introduction

This chapter introduces the literature on research conducted into teacher collaboration and collegiality and its links to teacher efficacy and professional development. The chapter starts off with defining what is meant by teacher efficacy, collaboration and collegiality. The links between collaboration, collegiality and teacher efficacy is explored as well as what teacher collegiality should not be. A brief overview of what a professional development programme is is outlined. Finally, the literature is explored to show the links between collaboration, collegiality, efficacy and professional development.

Defining teacher efficacy

According to Woolfolk (2007, pg.334), when teachers want to help learners learn better and see such potential in the most challenging learners, teachers are said to display a high level of efficacy. Peterson (1994) believes that teachers with a high level of efficacy develop the expertise and put in the efforts to positively impact on how learners learn. Teachers with high levels of efficacy tend to see past the challenges associated with socio-economic status, parental support, class size and learner interactions.

Woolfolk (2007, pg.334) states that efficacy is one of the few characteristics of teachers that can be correlated with student performance and achievements. Using self-efficacy theory, it can be predicted that teachers with a high level of efficacy, work harder and persist longer with their students. This is so because these teachers believe they can affect positive changes in learners' learning and their ability.

Efficacy is not a characteristic that teachers are taught during training. It is something which is experienced and developed through doubts whether, as a teacher, one can affect positive change in the learners' ability to learn. However, these doubts can be the catalyst to developing and/or improving a teacher's sense of efficacy. (Woolfolk, 2007, pp. 334-335). Doubts of a sense of efficacy can lead to:

- fostering reflection about one's own teaching ability
- motivation to learn and improve one's teaching practice
- greater awareness and appreciation of the diversity of how learners' learn
- positive collaboration with colleagues
- disequilibrium, as described by Piaget, which can motivate change

Developing and/or improving a teachers' level of efficacy can thus be achieved by teachers collaborating productively with colleagues. Motivation is thus intrinsic to improve one's teaching practice, so as to affect positive changes in learners' learning and performance.

In his monograph on building collaborative cultures in urban schools, Peterson (1994) argues that collegiality and efficacy can form a powerful combination to establish new collaborative cultures or reinforce existing collaborative cultures at schools; and reinforcing collegiality in these schools has been known to improve a teacher's sense of efficacy. This, in turn, supports collaborative work and contributes to making these schools more likely to be successful and build an on-going culture of renewal. Thus creating collaborative cultures at schools, which may manifest via collegial exchanges and see teachers working together to improve their learners' learning and performance. By sharing the same vision, collegial exchanges can improve teacher efficacy and this in turn may provide opportunities for improving classroom instruction, leading to improved learner performance.

Collaboration and collegiality: a definition

In his critique of research done by Hargreaves and Little, Fielding (cited in Jarzabkowski, 2002, pg. 2) points out that the terms “collaboration” and “collegiality” are often used interchangeably. This conflation is not done intentionally when one looks at the definitions of collaboration and collegiality provided by researchers over the years. Many see the terms as being subsets of each other i.e. the one being dependant on the other. (Jarzabkowski, 2002; Kelchtermans, 2006). As this study is about the effects of collaboration and collegiality on teachers’ efficacy, it is important that these terms be defined in the context of this study.

Kelchtermans (2006, pp.220-221) uses the term collaboration in a descriptive sense referring to the cooperative actions of teachers; how they do things together when performing their professional duties. Collegiality refers to the quality of the relationships between teachers in a school. Jarzabkowski (2002, pg.2) defines collaboration as the professional activities teachers conduct with their peers; and defines collegiality as the level of involvement of teachers with their peers, be it on an intellectual, moral, social and/or emotional level. It is clear that both researchers share a similar view of what collaboration and collegiality are. Therefore, when teachers collaborate they do so for professional reasons but when teachers are collegial with each other, it is for professional and social and/or emotional reasons. Collaboration is thus a subset of collegiality (Jarzabkowski, 2002, pg.2).

Kelchtermans (2006) argues that because the two are linked with professional and emotional or social activities, the two terms are used interchangeably. The two are reflections of each other because actions that allow teachers to work together professionally are determined by the quality of the relationship and vice versa. Jarzabkowski (2002, pg.3) concurs with Kelchtermans in saying that it is not easy to separate the two terms as it is difficult to separate the professional sphere from the social, given the myriad of interactions amongst teachers in the work place.

For the purpose of this study, the researcher will be defining collaboration and collegiality from research done by Jarzabkowski (2002, pg.2).

> Collaboration… takes its meaning from common English usage to denote teachers working in combination. It relates to the professional activities, the intellectual work conducted with peers, and in this regard is largely instrumental in function … collaboration is seen as a subset of collegiality, since the former relates only to the professional sphere of relationships while the latter encompasses both professional and social/emotional interaction in the workplace.

Collegiality and its influence on teacher efficacy

Much has been researched on the influence of social interactions, in particular collegiality, amongst teachers and its influence on teachers to develop effective strategies for teaching and learning in the classroom, i.e. teacher efficacy.

Fullan (1991, pg.117) states that if educational change is to occur in the classroom, teachers must first understand themselves and be understood by others. This alludes to the importance of teachers socialising with each other on a professional level, in order to increase efficacy in their teaching and learning.

Lortie, as cited in Fullan (1991, pg.119), conducted widespread research on what teachers do and think. A litany of issues was raised by Lortie's study with respect to teacher social interactions. He found that because of the cellular nature of schools, teachers struggle with their problems and anxieties about teaching and students' learning, spending most of their time isolated in their classrooms, physically apart from their colleagues; privatised as opposed to deprivatised practice. This physical isolation or privatised practice leads to a deficit in teaching culture as a result of not sharing, observing or discussing each other's work. This lack of sharing and not being able to reflect leads to teaching becoming an ambiguous ad hoc strategy; the most effective source of help are fellow teachers who are willing to share.

The above seems to indicate that collegiality, and not isolation, are important for teacher efficacy. The more teachers recognise the primacy of personal contact, the more they will do to bring about improvements in their teaching which they have identified as important. (Fullan, 1991, pg.132).

In support of the above, Peterson et al (1996, pg.120), states that the traditional structure of schools, where teachers are allocated a classroom of learners, tend to prevent the sharing of knowledge amongst teachers and contributes to teacher isolation and the fragmentation of knowledge at the classroom level. In their study, which involved gathering data on restructuring experiments in three elementary schools over a two year period, they came up with several hypotheses. Two of these hypotheses alluded to the importance of social interactions and their links to teacher efficacy.

The first hypothesis is as follows: “School structures can provide opportunities for the learning of new teaching practices and new strategies for student learning, but structures, by themselves, do not cause the learning to occur” (Peterson et al, 1996, pg.148). Their results indicated that when teachers were given the organisational space to meet and reflect collaboratively on their practices, a feeling of empowerment, pride and professionalism was experienced. They collectively felt a strong sense of moral responsibility towards their students. Fullan et al (2005) refers to this as engaging people’s moral purpose. This refers to the “why” for change. For most teachers it is about improving student achievement and closing the gap between those who find school meaningful and for those whom the school system has been less effective. It is about improving their performance so as to have access to opportunities to improve and create better citizens; the moral purpose of reform.

The other hypothesis forwarded by Peterson et al (1996, pg.149), states: “Successful relations occur among school structure, teaching practice, and student learning in schools where, because of recruitment and socialization, teachers share a common point of view about their purpose and principles of good practice. School structure follows from good practice and not vice versa”. On analysis of their data, they found that teachers who were committed to pedagogies associated with child-centred and constructivist approaches to learning, were the ones who created the most effective learning relationships with their learners. Where providing equal access to learners was important, teacher commitment to how they conducted their task was evident. Because of these socializations, teachers could connect “teaching practice and student learning to develop a deeply shared vision” (Peterson et al, 1996, pg.149).

A further indication of the importance of collegiality amongst teachers to increase their efficacy was indicated by research undertaken by Rowan (1990). In this research, the researcher focused on understanding how the organisational structures at schools support the professional decision making in classrooms, which have a bearing on how teachers work and thus on student outcomes.

Rowan (1990) proposed two models of school organisation that affect school processes to achieve school effectiveness. These models are called “control” and “commitment”. The control model or strategy refers to various systems of inputs, behaviour and output controls that regulate classroom teaching. The inputs are the policies from the school districts; the behaviours refer to the prescriptive nature, as outlined in the policies, of how teaching should be conducted so as to align teaching to the curriculum and the outputs are the expected increase in student achievements.

This, however, is a very mechanistic approach to teaching. An outcome of this way of teaching is that teaching becomes routinized and non-complex, making teachers' actions robotic in nature. This type of teaching is evident when teachers know that standardised tests will be conducted on learners and hence teachers teach to the content of the test to ensure that all learners pass. The result is high student achievement in basic skills but little ability in problem solving skills; teachers experience increased pressure as they are judged according to their learner pass rates. Teachers focused more on achieving the educational goals rather than on what these goals were and student needs were thought to be met whilst teaching the content of the tests. In this strategy, teaching becomes an autonomous and competitive practice; where there is little need to reflect on the moral purpose of teaching as outlined by Fullan et al (2005).

The commitment model or strategy, as outlined by Rowan (1990), is in contrast to the control strategy. This strategy looks to and supports innovative ways of supporting teachers and rejects the bureaucratic controls which constitute a technocratic way of teaching and learning, as prescribed by the control strategy. Rowan (1990, pg.354) states that "in this approach the collaborative and participative management practices will unleash the energy and expertise of committed teachers and thereby lead to improved student learning". In this strategy, teaching relies on the problem solving ability of the teacher.

When teaching is viewed as complex and non-routine, Rowan (1990, pg.357) points out that there is a need for greater support amongst teachers and what develops as a result is "organic patterns of school management" where teachers' commitment and motivation can be increased when teachers have more authority, variety and collegiality in their work. School improvement increases with an increase in collegiality and collaboration amongst teachers.

This links to what Lortie (Fullan, 1991) has found in his research on the effects of the cellular form of organising schools and what Peterson et al (1996) found on the traditional manner in which teaching is organised at schools. In his research, Rowan (1990, pg.374) states that the "commitment approach sees benefits to the development of collegial arrangements among teachers. Consistent with the literature on organic management, school reformers assume that collaborative arrangements will enhance teachers' capacity for learning and problem solving, build solidarity and cohesiveness within the school, and satisfy teachers' needs for affiliation".

Rowan (1990, pg.375) also draws on various findings, with regards to collegiality amongst teachers and its effectiveness on teaching in the classroom, undertaken by various researchers. Consistent with other research, he found that "teachers in schools with team arrangements gave more help than teachers in schools with traditional arrangements". This aligns also to the hypothesis put forward by Peterson et al (1996, pg.148) which states that "school structures can provide opportunities for the learning of new teaching practices and new strategies for student learning, but structures, by themselves, do not cause the learning to occur". Rowan's (1990) research into teacher collegiality confirms that teachers whose teaching is complex and non-routine were more likely to develop an organic approach to management and were thus more likely to look to colleagues for support and information.

Little (cited in Rowan, 1990), identified four practices that are associated with more successful schools: teachers engaged in frequent talk about teaching; teachers were observed and critiqued; teachers designed and planned teaching materials together; and teachers taught other teachers in various ways. Little concluded that teachers sought to improve their teaching via intensive forms of collegiality and collaboration.

To help conceptualise and evaluate the phenomenon of collegiality, Little (cited in Kelchtermans, 2006, pg.224) developed four levels of collegiality. These levels reflect the differences in the intensity of the relationship and form a continuum ranging from independence to interdependence. The four levels are:

1. Storytelling and scanning

At this level teachers merely talk to each other and gather information about their experiences with students. They do not engage in any form of deep discussion about their practices. At this level, friendships are nourished and reinforced. Teachers work independently from each other.

2. Aid and assistance

Aid and assistance are given to those who are in need. At this level help is asked not explicitly but implicitly and those who ask run the risk of being exposed professionally since self-esteem issues can be at play here, especially for those experienced teachers who tend to work independently and avoid having to deal with these implicit issues. The less experienced teachers are more prone to ask for assistance but at this level, assistance is merely the sharing of a resource, with no in-depth discussion on the use and development thereof.

3. Sharing ideas

This goes beyond the level of just exchanging resources for teaching. Some discussion around the sharing of ideas or resources can take place but not as in-depth so as to unpack the issues surrounding the usefulness and implementation thereof. The sharing of ideas is very much dependant on the teachers' norms and beliefs associated with sharing anything related to teaching and learning of learners. Some levels of socialisation are experienced but independence in the classroom is very much maintained.

4. Joint work

This level of collegiality exhibits true interdependence amongst teachers because the engagement of teachers at this level rests on the shared responsibility for their teaching practice. Teachers who collaborate at this level have a shared vision with regards to best practices so as to improve their efficacy. These encounters are conducted professionally, whether formally or informally initiated, to offer support for teacher's initiatives into best practices.

It is important to note that at this level, the need to collaborate arises with a need to address a collective challenge. The formal or informal manners in which these collaborations occur are not as important as the deep meaningful discussions that occur around the issues raised. Leonard and Leonard (cited in Kelchtermans, 2006, pg.225) states that although the value of the formal exchanges amongst teachers is appreciated, the value of the informal, voluntary collaboration is just as important because the voluntary, informal nature of collaboration is triggered by the need to address and solve a challenge related to improved teaching and better learner understanding.

Contrived versus true collaboration

Hargreaves (cited in Fullan, 1991, pg.136), warns against "contrived collegiality". He states that: "Contrived collegiality can lead to the proliferation of unwanted contacts among teachers, which consume already scarce time". Contrived collegiality, as stipulated by Hargreaves (cited in Kelchtermans, 2006, pg.226), is:

- administratively regulated and controlled
- compulsory
- implementation-orientated, i.e. putting other people's ideas into practice.
- fixed in time and space.

Contrived collegiality frequently happens when school administrators force teachers to work together in order to implement departmental policies. Often, schools also set aside time for teachers to conduct their departmental meetings, which is usually related to dealing with administrative issues rather than about issues relating to best practice or support/mentoring. These meetings are fixed and compulsory; thus making it the only time that teachers come into contact with each other. More often than not, teachers claim to work together but not realising that they are merely going through the motions associated with contrived collegiality.

True collaborative cultures…are deep, personal and enduring…Cultures of collaboration are constitutive of, absolutely central of, teachers' daily work." (Hargreaves cited in Fullan, 1991, pg.136). Hargreaves states that schools, at which a collaborative culture already exists, are schools where: (Kelchtermans, 2006, pg.231)

- teachers work voluntarily and spontaneously
- teachers have no external agenda, i.e. they are intrinsically motivated to solve the problem and not be judgemental of each other
- collaboration is development-orientated and not implementation-orientated
- collaboration is pervasive across time and space
- collaboration is unpredictable; teachers meet as the need to solve a challenge arises

Teacher professional development

Carlapio (cited in Credaro, 2006) states that change may be described as the adoption of an innovation where the ultimate goal is to improve the outcomes through an alteration of practice, but an alteration in teaching practices is not only what is required. Wood, as cited in Zevenbergen (2003, pg.2), states that change also requires a substantive change in a teacher's beliefs or ideologies.

> …when radical reforms in teacher practice are demanded, it is not sufficient enough to blame teachers for their inability to enact changes. The changes being demanded of teachers in recent times require a substantive ideological shift in their role in classrooms. …the changes being demanded of mathematics teachers in terms of new approaches often lack a "clear formulation (on how to enact reforms) but also requires a substantive change in teachers' beliefs.

Reform initiatives are constantly being implemented in schools when there are curricular changes in the education system or to fulfill the need for better classroom instruction. The belief is that better classroom instruction would translate into increased pass rates amongst learners. In any reform initiative in schools, teachers serve as the primary catalyst for change in student learning and performance (Brown and Benken, 2009, pg.55). In most cases it is improving student learning performance that is the reason for reform initiatives in schools. When this is used as the reason for implementing reforms in schools, the initiatives all fall under the label of professional development programmes (PDP) for teachers.

Researchers (Cook, 1997; Borko, 2004; Garet *et al,* 2001 and Brown and Benken, 2009) agree that an effective professional development programmed (PDP) for teachers can translate into increased student learning and an improvement in student pass rates. Defining what is meant by an effective professional development programme, Borko (2004, pp.5-6) lists three characteristics of an effective PDP:

- To help develop conceptual understanding, teachers must have rich and flexible knowledge of the subject they teach.
- The programme must help teachers to guide students' thinking by illustrating linkages between ideas and concepts thus showing how the subject develops.
- The programme should also focus on instructional practices that would improve classroom practices. This is crucial in developing teacher subject knowledge and students' thinking.

Brown and Benken (2009, pp.55-56) suggest that in any effective PDP:

- There should be collaboration between universities and schools.
- Teachers should meet to reflect as a community.
- Focus should be placed on improving curriculum understanding and instructional practices.
- Focus should be placed on modelling of practices to improve student learning.
- Emphasis must be placed on negotiating learning within a given context.

Collegiality and efficacy through teacher professional development

Thus, as proposed by many of the researchers' work discussed thus far, collegiality is paramount to developing teacher efficacy. But how does one develop these levels of collegiality and collaboration that are so essential to teachers' daily work? Gamoran et al (2000, pg.52) states that when "professional development is sustained, coherent, collaborative and reflective, it may lead to changes in teaching practice". Their research shows that professional development may influence the teachers' knowledge, skills and disposition, i.e. the human resources and may contribute to the social resources of the school, viz. collaboration, shared values, deprivatised practice or the non-cellular organisation of teaching, as suggested by Lortie (Fullan 1991) and Rowan (1990) and reflective discussions. The presence of social resources can enhance the human resources to improve teaching and learning in the organisational context of the classroom and the school.

Research conducted by Ashburn (cited in Harris and Anthony, 2001, pg.372), has teachers advocating for professional development to be more constructivist in nature and sustainable over long periods. Teachers are requesting that training be more collaborative in its approach so as to solve problems in practice together. This alludes to what was earlier stated by Rowan (1990), that when teaching is non-routine and complex, teachers tend to collaborate more often and form organic patterns of managing their teaching; moving away from environments associated with isolationism and presentism; environments in which teachers work alone and are not willing to change or experiment with new teaching approaches. Research indicates that collaboration and collegiality should play a central underlying theme in any teacher professional development programme.

However, the development of human and social resources can only manifest itself if the professional development has “sufficient funds to sustain it over time”. (Gamoran et al, 2000, pg.52). This development requires collaboration amongst teachers and sufficient resources available for the implementation of new ideas and practices, which would then impact on their ability to engage with non-routine and complex teaching practices. It also requires space for teachers to work together. If these criteria are fulfilled, then professional development has the ability to serve as a stimulus for change, via human and social resources, in classroom practice and subsequently in student performance.

Hargreaves (1994) highlights the idea that teachers must be aware of the reason for teacher professional development. When teacher professional development programmes are focused solely on the development of knowledge and skills, teachers either reject them or resist them by selecting only what is important in their teaching. Professional development, focussing on skills and knowledge, is not enough to get teachers to think about the moral purpose of teaching, as stated by Fullan (2005). When teachers know what learning is for and its intended purpose, teacher professional development becomes meaningful to them; which is why the social context of learning fulfils a critical and central role in teacher professional development.

Thus, Harris and Anthony (2001, pg.384) highlight two types of collegial interactions that are crucial to any professional development programme:

1. Collegial interactions that can produce an emotionally sustainable environment.
2. Collegial interactions that engender significant professional development.

Incorporating these two levels of collegial interactions into any professional development programme can foster increased levels of efficacy within teachers.

Thus teacher professional development must not only be about acquiring knowledge and skills, it must also adapt to the social contexts to allow teachers to reflect on their practice, observe and analyse best practices in other teachers, so that they may try and solve the dilemmas teachers face with respect to their classroom practices. Teacher professional development can help "to create the conditions of work and cultures of collaboration in which teachers can develop, clarify, review, reflect on and redefine their purposes, missions and visions" (Hargreaves,1994, pg.14). Hargreaves (1994) also suggests that reflection and dilemma resolution by teachers can be done by discussing practical approaches to problems together, either formally or informally.

Conclusion

Teachers with high levels of efficacy tend to see the potential in even the weakest learners. They work harder and persist longer with their learners in order for them to succeed. Research shows that collegiality and efficacy can form a powerful force in encouraging the creation of collaborative cultures at schools to improve teacher efficacy.

Research indicates that in schools that do not have a collaborative culture, teaching is viewed as a cellular and autonomous process and teaching becomes routine and non-complex. The goal of teaching is lost because what are aspired to are targets which become an indicator of teacher quality. However, when teachers adopt a more moral approach to teaching, teachers realise that it is important to offer the best teaching available to their learners, so that they may realise their potential. Teachers who are faced with these moral dilemmas in teaching, start to develop "organic patterns of school management" in order to solve these dilemmas. This is where teacher collaboration and collegiality start to play a crucial role. It is through collaboration and collegiality that teachers start reflecting together on issues of best practice, so as to improve their classroom practices and efficacy.

Teacher professional development is one way of developing collaborative cultures amongst teachers by making the social context of learning a critical and crucial part of teacher professional development. Only when teacher professional development has meaning for teachers, does it translate into improved efficacy and the learning becomes meaningful for the learners. When this occurs, teachers start to reflect, with other teachers, on their practice to try and solve the challenges they face in their classroom practices and these teachers start to create collaborative cultures at their schools, formally or informally.

This study is about describing and interpreting the effects of collegiality and collaboration on teacher efficacy, with a specific group of mathematics teachers. This implies that a qualitative interpretivist research approach within a case study design would be best suited to explore this phenomenon.

CHAPTER 3

RESEARCH DESIGN AND METHODS

The chapter outlines the research design and methods. A rationale for the study is provided followed by an overview of the project in which this study took place. Justification for the case under study is stated and the research questions are restated within this context. The case is constructed by describing the components of the case. Data collection strategies are then described followed by how the data for this study is to be analysed and presented. Finally, an outline of the strengths and weaknesses of this type of research design will be provided.

Background and rationale

It is easy to quantify increased understanding of content because the measurable indicator would be increased pass rates amongst learners or doing a pre- and post-test with teachers. However measuring improved teaching and learning is governed by many affective aspects such as behaviour, attitude, motivation, etc. which influence the social interactions and cultural exchanges between teachers. There are also the social factors, inside and outside the classroom, which influence the social and cultural interactions between teachers. These affective aspects and social factors are difficult to quantify and rely heavily on qualitative data, such as narratives, to indicate some sort of progress on how teaching and learning have improved in the classroom.

As a facilitator working with teachers, my job is mainly descriptive, interpretive and prescriptive. I identify, describe and interpret current instructional factors and processes and then design and prescribe treatments to achieve better results. But the social and cultural interactions occurring in the classroom, and the social contexts under which teaching and learning are happening in the classroom, tend to be ignored.

The rationale for doing this study is to describe the social interactions, i.e. the levels of collegiality and collaboration amongst a pair of mathematics teachers at an urban high school involved in an in-service professional development project, and interpret the effects it had on their efficacy levels. For the sake of this study, the school will be known by its pseudonym Dunbar High school. This thesis is thus a description and an interpretation of the social interactions, viz. levels of collaboration and collegiality amongst a pair of mathematicsMathematics teachers at Dunbar High school and the effect it had on their efficacy levels.

An overview of the in-service professional development programme: The SPARK project

This study is placed within the context of an in-service professional development programme called the SPARK project. Whilst working on the project my role was that of a facilitator, which has since switched to researcher whilst undertaking this study.

The SPARK project was a school based in-service professional development programme for teachers, with the following core outcomes: (SPARK proposal for the Zenex Foundation 2007-2009)

- to empower, inform and motivate teachers, and
- establish effective teaching methodology and improved classroom practice.

To ensure that these outcomes are reached, the service provider would: (SPARK proposal for the Zenex Foundation 2007-2009)

- Elevate the subject expertise of teachers via workshops to improve the teachers' subject knowledge for successful teaching and learning;
- Mentor and offer individual support to teachers through frequent visits by facilitators to their classrooms ensuring that new skills are implemented;
- Improve didactic skills of teachers, classroom practice, create networking opportunities amongst teachers and establishing support groups.

The project was initiated in 2007 and the purpose was to improve the mathematics teaching at five high schools in the Mitchell's Plain area. These schools are situated in low socio-economic areas, with gangsterism and poverty rife within the suburbs in which the schools are situated. Learners at these schools have low motivational levels and teachers were pushed emotionally to breaking point in order to deal with the social challenges experienced by learners. Teachers often fulfill the roles of the parent, social worker, psychologist, etc. in order to understand and deal with the disciplinary challenges they face.

The approach of the SPARK project was to concentrate on mathematics, physical science and English in the Further Education and Training (FET) phase viz. grades 10 to 12. Management and leadership programmes were also introduced to address the leadership and management challenges of the school. The project funder made use of service providers, whose brief was to develop a programme with various intervention strategies to improve teaching and learning in the classroom and ultimately learner performance in mathematics, English and physical science improve the school leadership and management. The focus of this study will be to interpret and describe the levels of collaboration and collegiality between the mathematics teachers at one of the five high schools, viz. Dunbar High School.

Many of the key features of a PDP as described by Brown and Benken (2009) are entrenched in the SPARK project. The project initially focused on working with mathematics teachers in five high schools on the Cape Flats, then four high schools in the last two years of the five year programme. The broad-based objective of this school-based PDP programme for teachers is to ensure successful teaching and learning so as to improve learner performance in mathematics, resulting in learners excelling in higher education programmes and thus being exposed to better career opportunities.

Intervention strategies used in SPARK project

The theory of change of the programme was based on the idea that change can occur in their teaching and classroom practices, if the teachers are prepared to strengthen and apply their content knowledge with confidence and experiment with the new teaching strategies. This also implied a change in their belief system. The intended result would be improvements in the teaching and learning of mathematics, which would lead to improved learner performance in mathematics. The programme activities, as defined in terms of the objectives in the SPARK project, are as follows: content based workshops, classroom on-site support visits and teacher cluster meetings. These intervention strategies link up to some of the characteristics of an effective PDP as listed by Borko (2004), Brown and Benken (2009) and Garet *et al* (2001).

Workshops

A workshop is defined by Garet *et al* (2001, pg.920) as "…a structured approach to professional development that occurs outside the teachers' own classroom. It generally involves a leader or leaders with special expertise and participants who attend sessions at scheduled times." This definition falls in line with how the workshops were conducted on the project with the outcomes being that, through workshops, teachers developed expert knowledge and improved skills in didactics. Borko (2004, pg.5) states:

> …to foster student's conceptual understanding, teachers must have rich and flexible knowledge of subjects they teach. …professional development programmes that include an explicit focus on subject matter can help teachers develop these powerful understandings.

The workshops for the SPARK project were designed to increase the content knowledge and didactic skills of the teachers. It was also decided to focus on the content of one grade per year, i.e. in 2007 grade 10 content, in 2008 grade 11 content and in 2009 grade 12 content would be covered. It was designed in this manner so that at the end of the project, the entire Mathematics curriculum for the Further Education and Training (FET) phase would have been dealt with. During 2010 and 2011 the workshops focused more on didactical skills than content.

There were eight workshops of eight hours each during each year of the three year duration of the project, viz. 2007 to 2009. Two workshops were offered per school term. During the last two years of the project, 2010 to 2011, the number of workshops were reduced to one per school term. Attendance ranged from 60% to 100%. Workshops were held during a school day from 8:00 am to 4:00 pm. Mathematics subject expertise was provided by university trained facilitators. This aligns with Brown and Benken (2009) listing collaboration between university and schools as an important aspect of an effective PDP.

Classroom support visits

Classroom on-site support visits were an opportunity to observe the educator in the classroom. Classroom support visits were seen as an "…opportunity for teachers to observe expert teachers and be observed teaching in their own classroom" (Garet *et al,* 2001, pg.925). During these support visits, facilitators would perform demonstration lessons or co-teach with teachers so as to model effective instructional practices. Brown and Benken (2009, pg.55) also lists classroom support visits as an important aspect of an effective PDP because it allows for "…modelling of practices that promote effective student learning".

Classroom support visits were an important part of the programme. There were three facilitators, of which the researcher was one of them, that conducted the classroom support visits. The facilitator(s) would visit each teacher at each school seven times a year for a minimum of 4 hours per teacher. These visits were equally spaced across the year and the function of these visits was to observe teachers in their classroom and/or model lessons and/or co-teach at the request of the educator.

At the end of the day's visit, a discussion would take place to focus on what was observed by the facilitator(s) and to discuss any issues, positive or negative, related to the lessons observed. Facilitator(s) completed an observation schedule per teacher after each visit, noting aspects such as context, teaching strategies, reflections and general progress of the teacher. The ultimate aim of these on-site support visits were to see whether teachers had started using the material and implementing the teaching strategies modelled in the workshops. The facilitator(s) saw their role as change facilitators; assisting teachers when they were ready to experiment with the material and new teaching strategies, via co-teaching, demonstration lessons and lesson plan discussions.

Cluster Meetings

The third type of intervention is the teacher cluster meeting. This was an opportunity for teachers to network and reflect collaboratively on their practices as a community. It was a forum for teachers to share ideas about improving classroom practices. The purpose of the cluster meetings was to create a strong professional learning community that could contribute to improving teachers' instructional practices. (Borko, 2004, pg.6). This forum also provided teachers with an opportunity to share material, discuss challenges and find solutions to common challenges. (Garet *et al,* 2001, pg.922). Cluster meetings were also held after school. All the teachers from each of the project schools attended these sessions for two to three hours after school, to discuss issues relating to classroom management, assessment and general teaching practices. This was also a networking opportunity for teachers to develop, share and discuss new and/or existing teaching resources.

Although facilitated by the facilitator(s), the teachers took full responsibility for running these sessions. It was at these sessions that relationships between the teachers started to develop and grow. These relationships played a pivotal role in establishing a professional learning community; albeit only during the project. It must be noted that during the last two years of the project, the cluster meeting component was removed from the project. Networking opportunities thus took place during the workshops.

Selecting the School

There were five project schools which participated in the project from 2007 to 2009. In 2010, the funder provided additional funding and, at the discretion of the funder, the project was restructured. Due to financial constraints, two schools viz. School C and School D were removed from the project and School E was added to the restructured project. There were thus four schools on the restructured project from 2010 to 2011, viz. School A, School B, Dunbar High and School E. Focusing on Dunbar High and not on any of the other project schools can be justified on three levels. Firstly, Dunbar high was the most successful school in terms of producing the most consistent results in grade 12 for mathematics. This is verified by the grade 12 learner results in mathematics, indicated in table 1 below.

Table 1: Spark project schools' results for grade 12 mathematics

SCHOOL	PASS %					
ACADEMIC YEAR	2007*** (SPARK project year 1)		2008* (SPARK project year 2)	2009 (SPARK project year 3)	2010** (SPARK project restructured year 1)	2011 (SPARK project restructured year 2)
	Higher Grade	Standard Grade				
SCHOOL A	100	52.9	47.7	15.1	16.7	88.2
SCHOOL B	/	50.5	34.3	43.4	37.3	64.9
SCHOOL C	40	15.9	43.7	36.2	NA****	NA
SCHOOL D	/	23.7	35	53.9	NA	NA
SCHOOL E	NA	NA	NA	NA	44.4	45.4
DUNBAR HIGH	/	37.2	54.7	59.2	72.4	68

Source: Provincial Project Manager for SPARK project, Schools results data base
*First examination based on new curriculum and grades were abolished.
**At funders' discretion, project was restructured, school C and school D was removed from project at funder's request; school E was added.
***Learners had a choice of writing the mathematics examination on either Higher Grade or Standard Grade.
****NA = Data **not available** because school E was not part of project from 2007 to 2009 and school C and school D removed from project after 2009.

However, it must be noted that despite School A achieving the highest pass percentage in grade 12 mathematics in 2011, Dunbar High was the only school that achieved one of the objectives of the SPARK project from 2008 to 2011, viz. consistent improvement in learner pass rates for grade 12 mathematics.

Despite the removal of School C and School D and the addition of School E, Dunbar High still showed the most consistent results in the grade 12 performance of learners in mathematics. Dunbar High was the only school to record a pass percentage of more than 50% from 2008 to 2011 and from 2008 to 2010 it was the best performing school. Schell (1992) argues that a rationale for doing a case study is that the case may represent an extreme or deviant case, which may well be worth documenting and analysing. Judging from their grade 12 learner performance in mathematics, I considered Dunbar High to be a deviant case in comparison to the other schools; an outlier worth documenting and analysing.

Yin (cited in Zainal, 2007, pg.2) states that “a case study is a unique way of observing any natural phenomenon which exists in a set of data. By unique it is meant that only a very small geographical area or number of subjects of interest is examined in detail”. This brings me to my second reason for using Dunbar High in this study. This case study is thus a unique way of observing the levels of collegiality and collaboration over a particular time frame which exists in a set of data. It is unique in that it will only concentrate on a very small geographical location, i.e. Dunbar High school, and focus on a certain number of individuals, i.e. the two mathematics teachers at the aforementioned school.

Thirdly, my justification for using Dunbar High is also intrinsic. I had a genuine interest in the school because it was at Dunbar High that the levels of collegiality and collaboration were more pronounced than at any of the other project schools, whilst observing these teachers.

My justification for using Dunbar High in this study, as opposed to the other project schools, is that I consider Dunbar High to be an outlier or deviant case, it is unique in terms of Yin’s description above and my motivation for using this school is intrinsic.

Research statement and questions

My rationale for this research is to describe and interpret the levels of social interaction, viz. collaboration and collegiality, between the teachers on an in-service professional development programme; and how it has influenced their changes in their beliefs and classroom practice during this professional development programme. The research questions are:

1. How have the levels of collaboration influenced the classroom teaching and practices of the teachers whilst being part of an in-service professional development programme?

2. How have the levels of collegiality influenced the efficacy of the teachers whilst being part of an in-service professional development programme?

The interpretive qualitative approach

Merriam (2002, pg.4) defines an interpretive qualitative approach as

> Learning how individuals experience and interact with their social world and the meaning it has for them.

This meaning is thus constructed socially when individuals start to interact. According to Merriam (2002, pp.4-6), there are key characteristics of any interpretive qualitative research approach.

Firstly, the intention of the research is to understand how people make sense of their experiences. This study is about how two mathematics teachers experience the levels of collegiality and collaboration between them, and the impact it had on their levels of efficacy. These teachers were engaged in a level of social interaction which impacted on their levels of efficacy, viz. classroom teaching and practice. The aim of this research falls in line with this characteristic of an interpretive qualitative research approach because it aims to understand and interpret the meaning of their collaborative and collegial experiences.

Secondly, in any interpretive qualitative research approach, the researcher is the primary instrument for collecting data. There were three facilitators on the project and each was solely responsible for collecting information and generating the classroom observation reports for their specific classroom support visits. The classroom observation reports were thus generated with a “facilitator hat” and not with a “researcher hat”, although these reports did allow us to sketch a holistic view of what was happening in the classroom and the context associated with it. As a researcher, it becomes easier for me to process, clarify and summarise these reports, which was to be used as data, as I fully understood the context in which the data were collected. The accuracy of the contents of the classroom observation reports, and thus the data, were also verified via discussions with each teacher participating in this study.

A third characteristic of an interpretive qualitative approach is that the end product is richly descriptive. The aim of this dissertation is to provide a rich, thick in-depth description and interpretation of a social phenomenon, viz. the levels of collegiality and collaboration between two mathematics teachers at Dunbar High school. Data from the classroom observation reports and the focus group interview will be used to describe the contexts, the participants and the social interactions of the participants, to support the findings of this study. The end product will thus be a rich, thick description of the social phenomenon being investigated.

As outlined above, this study has all the characteristics of an interpretive qualitative research approach. It is a study of the levels of collegiality and collaboration and how it impacts on their efficacy levels (the phenomenon). This understanding is mediated through the facilitator turned researcher as an instrument of data collection and the outcome of this study is a rich, thick description of the levels of collegiality and collaboration between the two teachers involved in this study. Since this study is linked to a specific project, containing a specific group of mathematics teachers, this study falls within a case study design, using the interpretive qualitative research approach.

The case study design

According to Yin (2009) a case study is used when the "how" and "why" questions are being asked about a contemporary set of events over which the researcher or investigator has little or no control. As this study focused on how the levels of collegiality and collaboration influenced the mathematics teacher classroom practices, this covered the one criteria as outlined by Yin. It must also be stated that the researcher, who fulfilled the role of a facilitator whilst on the project, by observing the teachers in their classrooms via participant-observation, had very little control over the contextual events governing the levels of collegiality and collaboration. As classrooms are dynamic and ever changing environments, decisions made by the teachers regarding their classroom practices, were entirely based on what transpired at that time.

Case studies can also be an in-depth longitudinal examination of a single case or event. The longitudinal examination provides a systematic way of observing the events, collecting data, analysing information and reporting over a long period of time (Zainal, 2007). Merriam (1988, pg.10) states the following:

> The decision to focus on qualitative case studies stems from the fact that this design is chosen precisely because researchers are interested in insight, discovery, and interpretation rather than hypothesis testing…By concentrating on a single phenomenon or entity ("the case") this approach aims to uncover the interaction of significant factors characteristic of the phenomenon.

A further reason for the researcher doing a case study is entrenched within the statement above. This is a study of one component of the case, viz. the mathematics teachers at Dunbar High school.

Describing the components of the case

The case, the SPARK project, can be described as a layered case consisting of the following components; the school context or geographic location of the school, the teacher participants and the site. These components make up the project or the case. This study is an investigation into one component of the case, namely the mathematics teachers at Dunbar High.

School context

The school is situated in Mitchell's Plain on the Cape Flats, within a low socio-economic area, where gangsterism and poverty are major problems. The school building is in fair condition but extra classrooms were built, which double as a school hall, and is used solely for examination purposes. The school grounds are well kept but litter tends to be a problem. Some classrooms appear bare and untidy with graffiti on the walls and insufficient desks. Some educators try their best to clean up their classrooms and make their rooms conducive to learning. The mathematics classrooms have some mathematics posters on the walls and are generally well kept with sufficient desks in the classes. There are approximately a thousand learners at the school of which approximately 250 are mathematics learners in grades 10, 11 and 12. The discipline is generally good. The majority of the learners are from English or Afrikaans speaking homes. This is a dual medium school offering instruction in both English and Afrikaans. There are some Xhosa speaking learners who are mostly in the English classes.

Teacher participants

For the purpose of this study the teachers have be given the pseudonyms "Jenny" and "Tara". Jenny and Tara have been teaching mathematics grade 10-12 for the last 15 to 20 years at the school. Due to the training on the SPARK project since 2007, their content knowledge and teaching skills have steadily improved. Their attitude towards the project has always been positive. Jenny has been serving as the Head of Department (HoD) for mathematics since the inception of the project.

As HoD for mathematics, Jenny has steadily taken control of her department and has developed a very stable and functioning mathematics department. In the beginning of the project, teacher motivation was low and levels of disillusionment and frustration were high. Effective team work was also lacking. However, as the project progressed, the HoD displayed excellent leadership qualities which motivated her team to succeed and produce steady improvements, in not only their teaching, but also in their learner results. Teachers were beginning to work together whilst the HoD ran an efficient and effective department. The hands-on approach by the teachers, inspired by the HoD, started to reap benefits in terms of learner results and improved teaching. The HoD offered excellent support and guidance to any new educators in the department. As a result of this support and guidance, teacher motivation levels increased and this resulted in high levels of effective team work. Friendly cooperation from teachers and HoD, during facilitation visits, created a positive rapport between the facilitator and the teacher.

Site selection

As a service provider, we had no input in terms of how the schools were chosen for the SPARK project. The project schools, which include Dunbar High school, were chosen according to a set of criteria, decided upon by the education district official(s) and the funder. For the SPARK project the following criteria were used: (SPARK proposal for the Zenex Foundation 2007-2009)

- The school is in a disadvantaged community.
- The school has a large black African learner population.
- The school is not a WCED Learner Achievement School (LAS) school.
- The school is not a Dinaledi (mathematics and science focus school) school.
- The school is not a Focus School.
- The school is situated in a 15 km radius of the EMDC (Education Management District Council) South.
- The school has a reasonable level of learning and teaching culture.
- The school offers physical science.

Initial contact with the school was made by the education district officials, the funder and the provincial project manager. This group was thus responsible for specifying:

- The site (school)
- The participants, namely the mathematics teachers at the school, and more specifically, the mathematics teachers in the Further Education and Training (FET) band.
- The duration of the project

Authorisation to enter the school was via a memorandum of understanding (MoU) which stipulated that the school was committed to the project for the next three years and the school would give its full cooperation to those delivering the intervention strategies, viz. the service provider. This document was signed by the principal of the school, the education district official(s) and the provincial project manager.

Once the MoU was signed, we were given the approval by the provincial project manager to enter the school and start delivering the planned intervention strategies to achieve the objectives of the project. I entered the school as a facilitator and not as a researcher, but my initial approach was not dissimilar to what a researcher would have done. My initial visits were to obtain information regarding the teachers, the school and the facilities. Researchers refer to this as mapping the field by acquiring data of the social, spatial and temporal relationships in the site to gain a sense of the total context of the school (McMillan and Schumacher, 2006). Social mapping notes the numbers and kinds of people, the organisational structure, and the activities the people in the school engage in. A spatial map notes the locations, the facilities and the services provided by the organisation or school. The temporal map is a description of the rhythms of the organisational life, the schedules and the unwritten routines.

Firstly, I noted the number of mathematics teachers and obtained information from them regarding their years of teaching experience and professional qualifications. Also noted was the number of learners that were being taught and how the school was organised in terms of the structure and functioning of its management. This was the social map.

Secondly, a description of the school's facilities was developed to get a sense of what was available for the teaching of mathematics and how they were used. Classes, computer rooms or specialised rooms were noted and described. Also noted was whether teachers had their own rooms for teaching or whether they shared classrooms with other teachers. In this case all mathematics teachers had their own classrooms, so there was this aspect of ownership which teachers could use to make their classrooms conducive to learning by arranging desks appropriately for teaching and learning, putting up posters and general maintenance to keep the room clean. This was the spatial map.

Thirdly, I obtained copies of the teachers' time tables and school time tables in order to get a sense of the organisational rhythms of the school. The school day was fairly fixed on most days but on particular days, the school was dismissed early so that teachers could involve themselves with extra-mural activities and also where subject heads could meet with their departments to discuss issues related to administration and the curriculum. Obtaining these schedules from the teachers was important in that it allowed me to plan my visits to the teachers. Dates for the visits were agreed upon by all parties and this made it easier for me to visit them. By being part of the discussion that decided on visit dates, the teachers were made to feel part of the project.

Site entry was scheduled for mid-January 2007, the start of the project. However, not all the monitoring instruments required for classroom observations had been completed. Documents from the school agreeing that they would be part of the project and which would grant me permission to enter the school, were not signed and site entry was delayed until April 2007. Only once these acceptance documents were signed by the school, the education district and the funder was access to the school granted.

It was important that a trusting relationship be established between myself and the teachers. The first year of the project was thus spent mostly on relationship building. I was cautious but firm in my approach. Excuses abounded from the teachers for not allowing me into their class initially because it was difficult for them to relinquish the control they had in their classrooms and to allow someone to observe them in their classrooms. The fear of exposing weaknesses in their teaching was always the greatest obstacle in allowing me to observe them. But once my role was understood and they started seeing me as a peer, those walls soon disappeared and I was able to get on with what I was tasked to do. It took a year for a trusting relationship to be established, but once it was there it became sacrosanct to both parties.

This is thus a case study within the boundaries of the project and sampling is thus purposeful. This study is a description and interpretation of the uniqueness of these individuals within a bounded system. Evidence for the portrayal, description and interpretation of this social phenomenon are provided by the data to represent and present reality (Qi 2009).

However, a drawback of using a case study design is its inability to provide generalizing conclusions (Zainal, 2007). This study will be triangulated with other pieces of data viz. a semi-structured focus group interview with the teachers. This will further validate the data from the classroom observation reports for this study.

The design of this research is thus a case study because:

- Dunbar High school produced the most consistent mathematics results in grade 12 learner results over the initial three year period and restructured two year period; and the school is an outlier or deviant case in comparison to the other project schools.
- The focus is on a detailed study of a single phenomenon within a specific context, which also focuses on a holistic in-depth a study of best practices.
- Time and financial constraints limited the scope of this study.

Types of data used in this study

Merriam (2002, pg.13) notes that:

> Whether pre-existing or researcher generated, documents often contain insights and clues into the phenomenon, and most researchers find them well worth the effort to locate and examine.

This research made use of the following types of data:

- Naturalistic and descriptive classroom observation reports; (pre-existing)
- Transcript of a semi-structured focus group interview. (researcher generated)

Generation of classroom observation reports via participant observation

The first type of data to be used will be the classroom observation reports. These were generated whilst the researcher served as a facilitator on the SPARK project. These reports were generated in a similar manner to participant observation.

As a facilitator, I played more of an observer role than that of a participant role during the project. I participated when the need arose to co-teach or do demonstration lessons but I did spend the entire school day with the teachers observing different classrooms and observing their daily rituals and teaching activities.

Emerson et al (2001, pg.353) defines the core function of participant observation as producing written accounts and descriptions of any social interactions within a particular situation. As a facilitator(s) I wrote down what was observed or experienced. Discussions were conducted afterwards with the teachers individually, which served as a reflection session. Thus, the data for this research was obtained via participant observation, which is verified by (a) discussion session(s) with the teacher(s) afterwards. The data was then used to produce narratives for my reports to the funder.

To do participant observation in a school, especially in classrooms, it pays to understand the social, political and economic constraints of the environment in which the school is situated. Although the constraints of the environment are important to note, it does beg the question of the extent of my immersion, since my focus was on observing a specific activity over a period of time. In my case, observing teaching and learning in the classroom. Spradley (cited in Dewalt et al, 1998, pg.262) identifies four degrees of participation:

- Non-participation:
  Acquiring information via no active participation
- Moderate participation:
  Ethnographer present but rarely interacts
- Active participation:
  Engages in all the rituals of what people are doing to learn about cultural behavior
- Complete participation:
  Becoming a member of the group being studied, going native

Since the facilitator's role is to observe, report and study the social interactions between teachers and to assist teachers in improving teaching and learning, my role was very rarely or never non-participatory or complete participation. Non-participation was not an option as I needed to cooperate with teachers in co-orientated social activity. Similarly, complete participation is not an option, despite the fact that I co-taught with teachers or did demonstrations lessons.

As a facilitator I was still perceived as an outsider and not a complete member of the school community. This might have had links to teachers and the school community viewing a facilitator as an education official, despite my independence from any government organisation. Another factor might also be linked to the sinister way in which educational officials conducted their activities during the apartheid era.

My roles were thus to involve myself in both more moderate and active participation. Moderate because on some days I merely observed, that is, being present at the scene; active participation because I was requested on some days to co-teach or give demonstration lessons. This is when I became part of the classroom and the closest I got to interacting with learners and taking part in the culture of teaching and learning in the classroom. It must be noted that because the level of immersion was not continuous or total, the levels of collegiality and collaboration were observed and reported within a specific context and time frame; which is a limitation on the classroom observation data and this study.

The focus group interview

The second type of data will be the transcript of a semi-structured focus group interview with these two teachers. The purpose of the interview is to triangulate the data within the classroom observation reports. Since the classroom observation reports were generated over a three year period, i.e. from 2007 to 2009, three years have elapsed since the last classroom observation report was generated by the facilitator(s). The aim of conducting the interview was to put on my "researcher hat" and compare the levels of collegiality and collaboration during and after the project. The data from the interview would thus provide further evidence in order to answer the research questions.

It was not a difficult task to arrange the interview. As the school was part of the project and having worked as a facilitator on the project at this school, I was already familiar with the setting and the interviewees. Contact was made with the Head of the mathematics Department at Dunbar High. This was made at least one month prior to the interview taking place. I requested an interview with both teachers but used the Head of the Department as a conduit to obtain permission to interview both. As Head of the mathematics Department, she approached the other teacher to be part of the focus group.

The Head of the Department had no problem with the interview and neither did the other teacher. Having worked with the interviewees, accessibility was made much easier. The final arrangements for the interview were made a week prior to the day of the interview. Contact was made via short message service and e-mail.

There were several reasons for conducting a semi-structured focus group interview. After analysing the classroom observation reports and consulting the literature review, my study already had a fairly clear focus. I thus only needed to address the specific themes generated by the classroom observation reports and the literature review. The questions used in the interview served as a guide so as to provide the interviewees with enough leeway to produce rich, thick narratives of their levels of collegiality and collaboration, and the impact it had on their levels of efficacy.

The second reason was based on the fact that they were the only two teachers I worked with during the first three years of the project, which is also the time frame of this study. As a pair, they taught all the mathematics classes from grades 10 to 12, and they were the most suitable candidates to provide me with the evidence I needed to answer my research questions.

Another reason for doing a semi-structured focus group interview was that both teachers could only avail themselves at that specific time and it would not have been possible to conduct two separate interviews. But this augured well because the final reason for conducting a focus group interview is that

- I wanted to observe their levels of interaction during the interview.
- It was important that they recount events, which were not clear from the classroom observation reports.
- There were certain covert observations made, pertaining to the school management, which attributed to the context of the observed actions and clarity was thus required.
- I wanted to counter any reactive effects, especially during the first year of the project which would have seen these teachers behave less “naturally” as compared to the subsequent years.

Data analysis method

Narrative inquiry is the process of studying the ways in which people experience the world. According to Connelly and Clandinin (1990, pg.2) “…education is the construction and reconstruction of personal and social stories; teachers and learners are storytellers…” Teachers construct stories of a phenomenon and researchers reconstruct these stories, via narratives, to interpret the meaning of the phenomenon. The phenomenon is thus the stories and the inquiry is thus the narrative.

Conle (2000) stipulates that narrative inquiry began to be used by researchers as a way of studying teachers in participant observation and also giving teachers a voice. Conle (2000, pg.53) further states the importance of the collaborative relationship between researcher and participant within narrative inquiry:

> Since the collaborative relationships involved often stretched over many months or even years, the shared meaning making could be seen as professional development for the teacher involved in a project, the researcher being in a role of secretary and facilitator…the voices of …facilitators featured quite largely in the resulting narrative texts.

Since this research uses a qualitative interpretivist approach, the idea is to reconstruct narratives interpreting the phenomenon, based on the stories of the participants. Using narrative inquiry as a data analysis strategy seems appropriate as this research is based on a collaborative relationship, on a PDP, that lasted for three years between facilitator and participants and now researcher and participants.

In their research article outlining the possibilities of using narrative analysis as a data analysis strategy, Connelly and Clandinin (1990, pg.3), stated the following:

> The educational importance of this line of work is that it brings theoretical ideas about the nature of human life as lived to bear on the educational experience as lived.

Two sets of textual data are to be analysed in this study. Stories about the phenomenon are told from two different perspectives, viz. the stories told from the facilitator(s) perspective in the classroom observation reports and the stories from the teachers themselves in the interview transcripts. Stories from the facilitator's perspective are told in terms of what was observed whilst conducting the on-site support visits. These are snapshots of the social interactions of the teachers, observed inside and outside the classroom. They provide a context in which the observations took place and are stories about how the facilitators perceived the teachers levels of collegiality and collaboration.

The interview transcripts provide stories from the perspective of the teachers; elaborating and corroborating the observations made by the facilitators. These are first-hand accounts of how the teachers perceive their levels of collegiality and collaboration and how their experiences attributed to increasing their levels of efficacy.

Stories providing evidence relating to answering the research questions will be extracted from the data and analysed. Both sets of texts will be read several times to look for stories providing evidence on the phenomenon, viz. teachers' levels of collegiality and collaboration. Stories providing evidence of the classroom practices will also be sought from both sets of data, providing evidence of their levels of efficacy. The stories from the classroom observation data will be analysed first to look for evidence on the teachers' levels of collegiality and collaboration and the impact on their levels of efficacy. The stories from the interview transcripts will be used to elaborate and corroborate what was observed by the facilitators and also to provide first-hand accounts of how they perceived and experienced their levels of collegiality and collaboration; an understanding of this phenomenon is sought from the teachers' perspective.

These stories will be used by the researcher to do an inquiry into the phenomenon under study by reconstructing the researchers own narrative about the levels of collegiality and collaboration as experienced by the two teachers in this study. The narratives constructed by the researcher will be done either through "broadening" or "burrowing" (Connelly and Clandinin, 1990, pg.11). "Broadening" refers to character and social descriptions within the phenomenon being studied; and "burrowing" refers to reconstructing the event from the point of view of the person at the time of the event. In this study, the researcher will be constructing his narratives via broadening and burrowing.

Confirmation of bias within this study

As stated before, one of the reasons for conducting this study is intrinsic. The close personal association of the researcher with the data and with the teachers involved in this study introduces bias. There is sample bias as I make no claim regarding the representivity of the mathematics teachers partaking in this study, to the larger population of mathematics teachers involved on the project. The sampling for this study was purposeful as they provided me with the evidence I needed to conduct this study. During the project, as a facilitator, I developed a close personal relationship with the two teachers involved in this study, thus biasing my objectivity in reporting the case. This is thus an open declaration of the bias inherent within this study due to the reflexive nature of the narratives developed whilst analysing the data.

Strengths and weaknesses of this type of research design

The strengths and weaknesses of this research design will be discussed from the framework proposed by Zainal (2007). She highlights three advantages and three disadvantages of using an interpretive qualitative case study design, which are similar to those referred to by Yin (cited in Zainal, 2007, pg.4).

Strengths

- Firstly, in case study research, the researcher becomes the primary instrument for data collection. The researcher thus has firsthand knowledge of the context under which the phenomenon being studied is observed. This was clearly the case in this study. The researcher initially fulfilled the role as a facilitator and observed the teachers within their own environment, data were collected within a specific context and the facilitator was not isolated from the context. The data were examined within the situation in which the activity took place.

- Secondly, case studies allow for both quantitative and qualitative data to be used, irrespective the type of case study being used. Since these observations took place during the initial phase of this study, i.e. over a three year period of the SPARK project, it generated part of the data used in this study. The second phase of this study generated the transcript of the focus group interview. This study relies mostly on qualitative data from observation reports, generated over the duration of the project and the focus group interview.

- Thirdly, the detail entrenched in narratives produced by case studies not only helps to interpret the data in a real life environment, but also helps to explain the complexities of real life situations. This study investigated the contemporary phenomenon of the levels of collegiality and collaboration within a real life context, viz. the classroom. This thesis provides a rich, thick description of the complexities of the levels of collegiality and collaboration within the realities of the classroom environment.

Weaknesses

Zainal (2007) bases her weaknesses of case studies on Yin's critique of case studies.

- Firstly, case studies have been accused of not having enough rigor because it is viewed as a less desirable form of inquiry, unlike experiments or surveys (Yin, 2009). The researcher in this case will be referring and consulting only the reports and interview transcript to ensure that all evidence in support of the research questions are detailed and reported. The approach is thus to be as transparent as possible.

- Secondly, case studies provide little basis for scientific generalisation. With the bias inherent in this research, no attempt is made to generalise to populations in this research. As Yin (2009) states, the goal is to generalise to theoretical propositions and not to populations.

- Thirdly, case studies have been accused of being too lengthy. The researcher, in this study, has explored methods to provide the reader with a succinct account of this study, whilst providing the reader with a thick, rich and detailed account of the phenomenon under investigation.

Finally, despite this study investigating a phenomenon within one component of the case, viz. the SPARK project; this study is not an attempt at programme evaluation. This study is an interpretative qualitative investigation built around one component of the case, viz. the mathematics teachers.

CHAPTER 4

DATA ANALYSIS

This chapter will provide a description of how the data were formatted for analysis. An analysis of the formatted data will be provided in the light of the research questions. The research questions are:

1. How have the levels of collaboration influenced the classroom teaching and practices of the teachers whilst being part of an in-service professional development programme?

2. How have the levels of collegiality influenced the efficacy of the teachers whilst being part of an in-service professional development programme?

Data used for analysis

Two types of data are used for analysis. The first is the classroom observation reports which were generated over the initial period of the project from 2007 to 2009, by the facilitator(s) on the project. Due to the qualitative and reflexive nature of these reports, the researcher found these reports best suited to answer the research questions. Since it is important to place the social interactions of the teachers into a specific context, and to see the links between these social interactions and their teaching, only certain sections of the classroom observation reports were used as data for this study. The classroom observation reports to be analysed for this study were thus condensed to highlight the teacher interactions and their behaviour as these sections were best suited to answer the research questions. The data is thus made up of observations and reflective comments by the facilitator(s) about the teachers involved in this study. The researcher used these reflective comments to interpret the levels of collegiality and collaboration amongst the teachers involved in this study, by reconstructing a narrative using narrative inquiry as a means of data analysis.

The second type of data used in this study is a transcript of a semi-structured focus group interview done with the two teachers at Dunbar High. This interview was done in June 2012, three years after the initial phase of the project. The reason for the interview was to triangulate the data in the classroom observation reports. The interview was conducted by the researcher, who also transcribed the interview for data analysis. The duration of the interview was approximately thirty eight minutes and was conducted at the school where the participants are currently teaching. The researcher used the stories of the teachers to interpret the levels of collegiality and collaboration amongst the teachers involved in this study, by reconstructing a narrative using narrative inquiry as a means of data analysis.

Data Analysis: The classroom observation reports 2007 to 2009

An analysis of the classroom observation reports is presented below describing the levels of collaboration and collegiality between the two teachers and the role it had on their levels of efficacy. This analysis also highlights the experiences of the teachers whilst being part of a PDP. It also describes the role a professional development programme, viz. the SPARK project, had on their levels of collaboration, collegiality and efficacy. The two teachers, as stated previously, will be known by the pseudonyms Tara and Jenny.

Year 2007: First year of SPARK project

The first observations made about Tara and Jenny indicated that there was an existing level of collegiality and collaboration between Tara and Jenny.

> They are well organised in their teaching approach and display an excellent working relationship. My observation was that these educators are very competent, experienced, dedicated and well organised, but they experience a lot of work pressure.[1]

[1] Classroom observation report, SPARK project, 19 April 2007, appendix 6

In terms of lesson preparation, they were organised and had a very business-like approach to planning and teaching. However, two major challenges existed, namely, they were finding it increasingly difficult to cope with the workload of teaching grades 10, 11 and 12 simultaneously. The pressure to improve the learners' results in mathematics was also increasing. Reasons for these challenges were the fact that a new curriculum was introduced, of which they had very little knowledge and the expectations of the school from Tara and Jenny to increase the pass rate of learners doing mathematics in grades 10, 11 and 12.

This was basically the trend in 2007, but probably the biggest challenge was the absence of Jenny, due to the death of her husband and the ability of Tara to cope with Jenny's absence. The facilitator observed the following:

> Jenny is currently off on sick leave for the term and could possibly not return. Currently looking for a replacement as she has grades 10, 11 and 12. Concern for grade 12's but Tara is currently sharing this load. Grade 11's results were fair, highest symbol a B. [2]

Half way through the year, Tara was finding it increasingly difficult to cope due to the absence of Jenny. She had to take over the leadership of the mathematics department, but most importantly, she took over the teaching of Jenny's matric mathematics classes. She now had to cope with her own and Jenny's matric classes. Despite these challenges, Tara still managed to produce good results in grade 11. This was the first indication of the levels of shared responsibility between Tara and Jenny; an indication of the levels of collaboration and collegiality between Tara and Jenny.

[2] Classroom observation report, SPARK project, 30 July 2007, appendix 6

Jenny did return to her teaching post in the fourth term of 2007. Tara was assisting her and keeping her informed of what had transpired in her absence.

> Jenny has returned and is currently catching up the work with Tara. Being able to adapt after such long leave is a major challenge for Jenny. Substitute educator has covered certain sections of the work. But I have no doubt that using the excellent support base of the other educators, she will adapt.[3]

What was interesting to note is that, despite Tara taking on the additional workload of Jenny during her absence, there was a sense of camaraderie and eagerness on Tara's part to get Jenny back on track. The support shown from Tara to assist Jenny on her return was testament to the deep levels of collegiality which already existed between Jenny and Tara. There were high levels of emotional and professional support between Tara and Jenny.

Year one was about the facilitators building a relationship with Tara and Jenny. It was difficult for the facilitator(s) to do so as Tara and Jenny were faced with professional and emotional challenges, which hampered their initial commitment to the project. Despite these challenges, Tara showed resilience in the face of adversity and was prepared to show emotional and professional support to Jenny, instead of resentment on Jenny's return from an almost year long absence from the classroom. This was the first indication of the deep levels collegiality that existed between Tara and Jenny.

Year 2008: Second year of SPARK project

Year two seemed a much better year for Tara and Jenny, not just emotionally but also professionally. Jenny was working through her personal challenges and Tara was offering her emotional and professional support. There was also a renewed sense of urgency, from both Tara and Jenny, to become more actively involved in the project activities. Dealing with all the challenges in year one was distracting Tara and Jenny from becoming involved in the project activities during the first year.

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[3] Classroom observation report, SPARK project, 02 October 2007, appendix 6

The trust levels between the facilitator(s) and the teachers were also firmly established and entrenched. They allowed me more access to their classrooms facilitating for more in-depth observations and discussions between teacher and facilitator(s) and between teacher and teacher. There was also a reinforcing of their levels of collegiality and collaboration as evidenced by the following observations made by the facilitator.

> There is a close working relationship between the mathematics educators at the school. They meet regularly and are always willing to assist each other. They plan well together and they are always prepared to tackle new challenges.[4]

Although this was first observed at the beginning of year one, this close working relationship was definitely one of their strong characteristics. What is important to note is that they planned their lessons together and are always prepared to take on new challenges, as noted by the facilitator. This alludes to the efficacy levels of Tara and Jenny being developed. After one year on the project, Tara and Jenny showed increased confidence in delivering the curriculum, although this is not explicitly stated for Jenny in the reports above as she already had a good sense of what to teach and when to do so.

Their willingness to improve their teaching, i.e. efficacy levels, was also driven by their relationship with their learners, as illustrated in the facilitator observations below.

> Tara has a good relationship with her class. The work ethic and homework issue must be worked on and sorted out with the support of the SMT (school management team). Tara has a positive influence on her learners and they regard her classroom as a clean safe place where they can work and focus. I am very positive about the influence Jenny has on the children that she teaches but am very worried about the pace at which she teaches.[5]

[4] Classroom observation report, SPARK project, 6 February 2008, appendix 6
[5] Classroom observation report, SPARK project, 12 March 2008, appendix 6

Two challenges, that of homework and the pace at which teaching takes place are highlighted here. To get learners to complete homework assignments was always a challenge for Tara and Jenny. This was one of the reasons for slowing the pace of teaching as Tara and Jenny were not allowing the learners to get away with not doing homework. They forced the learners to complete their homework in class, before moving onto the next section of work. Tara and Jenny were not prepared to continue with their teaching unless the learners understood the previous work. They entrenched discipline into their learners in this way because no support was forthcoming from the school management to help them deal with this issue.

As Tara and Jenny persevered with their learners, there were positives developing in terms of their teaching, as observed by the facilitators below.

> Tara is doing the right thing by testing prior knowledge and making sure that it is understood. The learners were very willing to stay in during break to go on with the work. This shows eagerness and a willingness to work. The relaxed atmosphere does lend itself to reflective thought, but the pace must be picked up. The pace remains slow, but a big positive is that the homework was taken seriously by the learners and it was done! [6]

These observations indicate that Tara and Jenny's levels of efficacy were starting to increase. Tara was beginning to test the prior knowledge of learners before starting the next section of work. She wanted to make sure that the learners had a proper understanding of the concept(s) being taught, despite slowing down the pace at which she was teaching. Jenny started to develop a reflective atmosphere in her classroom because she was encouraging her learners to think about what they were doing. The learners were critically analysing what they were being taught. There seemed a gradual shift in their teaching strategies to offer their learners the best possible way of teaching for understanding.

[6] Classroom observation reports, SPARK project, 6 May 2008, 23 May 2008, appendix 6

These observations also indicate a positive for Jenny in that her learners also started to do their homework and take their work seriously. Tara and Jenny started offering up their breaks to assist their learners who were struggling with the work and preparing them for the upcoming examinations. This willingness and eagerness on the part of the learners motivated Tara and Jenny to work even closer together to explore new ways of teaching using the resources they received during the workshops whilst being on the SPARK project. As a result, their levels of collaboration and collegiality intensified as they began to discuss and incorporate the resources from the project to explore new teaching strategies; which positively affected their levels of efficacy.

Year two was thus a year in which Tara and Jenny were determined to make their teaching more meaningful for themselves and thus improve learners' understanding of the mathematical concepts. Using their knowledge gained whilst attending project workshops to improve their content knowledge, they intensified their collaborative efforts to devise new approaches to teaching; thus improving their efficacy levels.

Year 2009: Third year of SPARK project

The confidence levels of Tara and Jenny were steadily increasing because their content knowledge was steadily improving. With this new found confidence, they were starting to further explore new teaching strategies to improve their teaching and learners' understanding of the mathematical concepts. The same observation was made about both educators.

> Educator is an experienced one and she is always open to new ideas. There seems a lot more confidence in her teaching.[7]

[7] Classroom observation report, SPARK project, 11 March 2009, appendix 6

However, new challenges constantly arose which caused concern for Tara and Jenny.

> There is grave concern, from both educators, about completing the term's work for this grade. Learners are struggling to adapt to new teaching methods and assessment methods. The low levels of literacy and numeracy of the learners at this level, is making it harder to work at a faster pace.[8]

Despite their levels of despondency, Tara and Jenny rose to the challenge. Due to their deep levels of collegiality, which was already entrenched in their practice, they had the confidence to deal with these types of challengers. They were not afraid to ask for advice and used it to solve the issues at hand. They tackled everything collectively and their levels of motivation were always intrinsically motivated by offering learners the best possible opportunities to learn. To help tackle this challenge, they began to monitor learner's progress and offer individual attention to learners who needed it the most. They did not see this as an additional burden, but they saw it as an obligation towards the learners. They began to intensify their support to the struggling learners by decreasing the number of learners in the class and making their classes more manageable. It was also during this time that the pressure was becoming too much for Jenny, but due to the support offered by Tara, once again, Jenny managed to overcome her personal challenges.

> Excellent educator but does have bouts of depression from time to time. Feeling the pressure of completing syllabus…[9]

[8] Classroom observation report, SPARK project, 1 June 2009, appendix 6
[9] Classroom observation report, SPARK project, 12 May 2009, appendix 6

As the initial phase of the project came to an end towards 2009, the comments made below by the facilitator, in this case the researcher as well, during his final support visits, summed up the progress made by these two educators.

> The levels of pace and efficiency at which these educators work is a testament to the excellent working relationship and experience they have. Making much greater progress with syllabus than in 2008. Confidence levels in teaching problematic areas has increased and more organised administratively.[10]

During the three year period of the project, Tara and Jenny, via their collaborative efforts, began to improve their levels of efficacy. The increase in their content knowledge and pedagogical skills, as a result of being on the SPARK project, saw them collectively increasing their confidence levels to deliver the curriculum effectively and address any challenges. Those deep levels of collaboration and collegiality were sustained several years after the project, as evidenced by the focus group interview done with Tara and Jenny, three years after initial phase of the project. A semi-structured focus group interview was conducted to triangulate the data found and interpreted by the researcher using the classroom observation reports during the first three years of the project.

[10] Classroom observation report, SPARK project, 4 August 2009, 25 August 2009, appendix 6

Data Analysis: The focus group interview

An analysis of the semi-structured focus group interview is presented below describing the role the levels of collaboration and collegiality had on their levels of efficacy. It also describes the role a professional development programme, viz. the SPARK project, had on their levels of collaboration, collegiality and their efficacy. The two teachers, as previously stated, are called Tara and Jenny. The interviewer, who is also the researcher, is coded as RJ.

As this was initially planned as a semi-structured interview, the interview soon generated into an unstructured one as the researcher allowed participants to freely express their thoughts and opinions. Allowing for the interview to organically unfold, the participants soon answered the questions after the initial question. The interviewer thus found himself referring less frequently to the interview guide.

The interview was initiated by the researcher posing the following question to both educators. The question related to describing their working relationship. This question aimed to establish how their levels of collegiality and collaboration developed.

> Tara: okay, No the relationship between me and Jenny at uhh let me put it to you this way, I've been trained to teach at a primary school, right up to grade 7, but when I came here I had to teach higher grades so every year it was like climbing a ladder...so I started in grade 8, had about five/six classes of grade 9's and then I moved to grade 10 and then I said to Jenny, no I don't want to go higher, I don't think I will be capable to do that and she (Jenny) said no Tara, I will take you by the hand and we will come and sit here in my class in the afternoons and she will start with a chapter and and she would say…she (Jenny) would teach it to me and she would say, this is what you do here and I will write it down {softly said but very dramatically}… I will write it down and then I will go home and I will go sit with it and I will come and ask her "is this what I am suppose to do"? and "that is what I am suppose to do"?

Tara clearly describes how the collegial relationship started. She could have easily said no to teaching in the higher grades but she trusted Jenny and allowed herself to be taught by Jenny. Tara clearly showed an interest in developing her efficacy by wanting to improve her instructional practice. Having Jenny with her indicated that not only was there professional support but also emotional support. Jenny showed great leadership and patience to train and mentor Tara in becoming a better teacher.

This clearly illustrates how Tara's doubts about her teaching practice can lead to increasing her efficacy. By having these doubts regarding her efficacy, Tara reflected on her own teaching ability, she was motivated to improve her practice, and because of the disequilibrium experienced by Tara (Woolfolk 2007), Tara collaborated positively with Jenny. Jenny also felt a sense of responsibility to help Tara become a better teacher because, in her response to the question, Jenny clearly saw potential in Tara.

> Jenny: Of course! Of course! There is a potential in her...there is a potential in everybody and she is a very strong teacher, a very strong, very firm teacher and she is eager to learn…and my side I like to give whatever I have.. I like to give and she was eager to get … we not only have a professional relationship, we have a personal relationship also …

This clearly illustrates how their levels of collaboration and collegiality influenced their levels of efficacy. This powerful combination was the catalyst in establishing a collaborative culture in their workplace. The motivation by Tara was intrinsic to improve her efficacy and Jenny displayed strong leadership qualities by helping Tara. Jenny and Tara not only collaborated but developed a collegial relationship as well, encompassing both professional and social/emotional interaction in the workplace.

> Jenny: Okay, since my husband passed away, I would like pop in and will tell her how I feel and she's always there, she'll always listen and we will give advice for each other … and because we don't only have a professional relationship, we do understand each other personally also.

It is thus through Tara's doubts about her efficacy that this collegial relationship started. Tara also found the emotional and professional support in Jenny and levels of trust were also established. Jenny too began to find emotional and professional support in Tara.

A further piece of evidence indicating the depth of their collegial relationship was during the first year of the project. In 2007, Jenny was absent quite frequently due to the death of her husband the previous year. It would have been quite easy for Tara to not take any responsibility, but due to the nature of their relationship, Tara assumed the leadership role and was totally committed to taking on the responsibilities of Jenny. This is also highlighted in year one of the classroom observation analysis.

> Tara: … So for me it was a tough year but I knew what she was going through, so I didn't have a choice and I just had to be strong and just get the job done. So I was doing that but nobody in front {pointing to administration block, referring to principal and management team} came to thank me personally.

> Tara: … At the matric ball at the end of the year, the maths matriculants they stood on the stage and they said we are thanking Tara for her sacrifice. They thanked me.

Tara was clearly committed to helping out with Jenny's classes in her absence. She knew what was expected of her and she found innovative ways of dealing with teaching and managing the department in Jenny's absence. Tara automatically assumed responsibility because she was driven by the need to help Jenny, but most importantly, Tara's first priority were the learners who thanked her for her efforts. She felt that she had a moral obligation to assume Jenny's duty and help the learners.

It is interesting to note that the school management or “school structures” was not very supportive of her efforts, but that did not deter her because she created opportunities for Jenny’s learners to be exposed to teaching and learning. When she succeeded, a feeling of empowerment, pride and professionalism was experienced. Tara felt empowered to conduct herself professionally in her duties and prided herself in that she could assist Jenny.

Another question asked to the participants related to the manner in which they met, viz. was it formal or informal. It was explained that the school set aside Wednesday afternoons to meet formally as a mathematics department, but when the extra classes for the students were introduced, this fixed meeting period fell away and Tara and Jenny started meeting informally to discuss teaching strategies. But this did not bother Tara and Jenny as they started to meet or voluntarily collaborate to address any challenges related to improving teaching and learning.

> Jenny: Very informal…very informal. We would like the afternoon sit and I would like say we first discuss how far we are with the work? Are we on par? I would say like “Tara I’m here, are you there, are we going to be finished with that next week? Yes? What test are we going to be writing because we wrote a test every Friday. Now I will tell Tara, I will set up the test, this is the test, and every Friday I’ll have the test ready for her and then we’ll meet very informally but very…uhm…speaking about the work also, almost all the time speaking about the work. And then we’ll also meet when Tara says or I says “how can I explain this in another way, I just can’t remember this work again. The we’ll sit together and discuss it, and then I will tell her that I’m not satisfied with the way we going to teach it or whatever, and I’ll sleep over it a day or two then I’ll just get something…{laughter/giggle}.

What is evident from the above is that these meetings had all the attributes of a collaborative culture. These teachers worked voluntarily and spontaneously, their collaboration was development orientated, the meeting times were not fixed and unpredictable; they would meet to address and solve a challenge. This story also highlights Little's (cited in Rowan, 1990) fourth level of collegiality, viz. joint work. At this level, true interdependence is exhibited amongst Tara and Jenny. They have a shared vision regarding best practices so as to improve their efficacy; deep, meaningful discussions occurred about their practice. It is also evident that Tara and Jenny engaged in frequent talks about their teaching, they designed and planned teaching materials together as they taught each other. They began to display attributes considered to be practices associated with successful schools. This could explain the gradual increase in the learners' results over the initial project period of the PDP.

Another important aspect highlighted was how they termed the period on the project as being the most productive time in their teaching career. This ties in with what was stated when asked about how the project influenced their levels of collaboration.

Tara: Yes!

Jenny: the most productive time

Tara: Definitely, definitely

Hargreaves (1994) noted that teacher professional development can help "to create the conditions of work and cultures of collaboration in which teachers can develop, clarify, review, reflect on and redefine their purposes, missions and visions". This is clearly what took place because having more teaching materials to use, Tara and Jenny could develop more materials for teaching but also engage in more meaningful discussions regarding best practice.

> Jenny: We had a lot more of extra things to talk about. Say for instance we had our textbooks, our textbooks that we had and then we had the SPARK notes and the SPARK uh things that you gave us. And then we will look at it and say okay I can use this for an investigation. Then I will sit with it and say Tara, are we going to do this or what? Okay let us sort something out here, then we do that. So uhm, yes our relationship, we were much closer after that.
>
> Tara: Mmm…mmm…{affirming what Jenny said}

Being on a PDP has not just intensified their levels of collaboration; it has also increased their content knowledge, which in turn made learning and teaching more meaningful for Tara and Jenny, as outlined below. When Tara and Jenny knew and understood what they were being taught in the workshops, teacher professional development became meaningful to them. This is why their collegiality levels intensified, fulfilling an important aspect of PDP.

> Jenny: Yes it came at worst time of my life…It doesn't matter for that, I needed to do that. Not because I was the HoD, not because I was the HoD, because it was something new…something new that we're part of. I think it's the first project that we, as a school, was part of and we were also starting the new syllabus I think, I really needed guidance in there…I needed guidance and I felt that I need guidance so that I can guide my…my team afterwards…uhm and…

> Tara: Huh…RJ! {exclaiming breathlessly } for me it was just amazing, just amazing. The amount of knowledge that I had, to the amount of knowledge after the project or during the project, it's such a major difference Ramesh. I learnt things I never thought of before, you know. Logs and exponents and things I have never been exposed to it, never. When you are being trained to teach at a primary school it's just up to certain level and that's it. You know, even your examinations at the college, and now it's like a different world opening, now I see things and people are explaining things that I never thought of. The angle that they explain it, I never thought of that. It excited me {excitedly said}.

Tara and Jenny's confidence levels in delivering the curriculum also intensified, as outlined below. They stated that because of their confidence levels in teaching increasing, their learners' results also improved.

> Tara: Ramesh...uhmm...when we became part of the project it was a confidence{clicked fingers in air} boost man, honestly. I was standing in front of the class and I know exactly what I wanted to teach and I think the pupils could pick that up, you know. That change, the easier ways to teach it.

> Jenny: Yes I agree with that. If the teacher don't show confidence in front, the learners will never be confident in themselves also. I always tell my teachers be prepared in your class and show the learners you know your work.

This latches onto how important it was for Tara and Jenny to change their teaching strategies; converting to the commitment strategy. By exploring best practices within their teaching, whilst being on a PDP, Tara and Jenny's collaboration intensified and their teaching became non-routine and complex, i.e. their levels of efficacy increased. They started committing themselves to pedagogies associated with offering the best possible teaching and learning opportunities for the learner. Tara and Jenny, as a result of their collaboration, developed a deeply shared vision of their teaching practice and student learning. The extract below illustrates, not just how they experimented with new teaching strategies, but it also indicates how their learners responded.

> Jenny: Usually when I try something new, I don't tell them it's something new. I try it and they will just catch it just like that. Then I will tell them how I use to do it before. Then I will do whatever explanation, I will do it after that and then they said, Miss no but the first one is better. Then I will say you know I discussed this with Tara, we discussed it and we decided to do that. … Yes…because of our relationship, the learners are not scared to tell her or me but uhm..you know Miss I went to Tara and Tara explained this to me, I understand. Or her (Tara's) learners come to her and say they came to me.

Clearly their collaborative culture had a positive impact on how their learners saw and treated them. But when one considers how important the learners were to Tara and Jenny, one cannot help but understand why Tara and Jenny developed this collegial relationship. This refers to the reason for the change. Why Tara and Jenny changed is that they felt morally obligated to do so, as outlined below.

> Jenny: We always felt a sense of responsibility towards the learners. But because like I said previously because it was new syllabus the responsibility was much (stronger??) … doesn't matter what we have to go through but they are the persons that must benefit here, they are the persons that must learn. And we as teachers we must try our best so that they can understand what we saying, so they can understand all the steps and whatever. And so they can enjoy of course, they can enjoy it of course…{Laughter, satisfied}. Because the learner must enjoy the class.

Because they had a moral obligation to their learners, Tara and Jenny started to collaborate and intensify their levels of collegiality and efficacy. They committed themselves to the commitment strategy of teaching in which their collaborative and participative management practices unleashed the energy and expertise leading to improved student learning.

This interview was conducted three years after the initial phase of the SPARK project was concluded. But it is clear from the evidence in the stories that they still value their collaborative inputs and still use it to improve their efficacy levels. The final question asked to the participants verified this but it also points to the value they place on their levels of collegiality and collaboration and how important it was to establish these emotional and professional environments. The question was posed as a response to a quote: "True collaboration is deep, personal and enduring" (Hargreaves cited in Fullan, 1991). How would you respond to this statement?

> Jenny: Yes, I agree fully, I agree fully with that statement. Deep, personal and enduring…we've been through a lot. We've been through a whole lot; deep things and I'm talking about on a personal level, on a personal level and because we knew we could trust one another, then the relationship just grew stronger. Uhm… because of the persons, and she had to endure a lot {slight giggle}. I would like , I would come if I had a problem with the learners or if …do you remember {to Tara} that grade 10 class I had, they will like say such funny stuff … I think it depends on the type of person you are. Should be a type of person with a lot of patience. Both of us we have a lot of patience and it depends also what your relationship…what do you think about the next human being, not just the next teacher, what is your feelings about the next human being, what respect do you have for that teacher. And uhm … that's it. We have mutual respect, we working together very nicely, very nicely.

What has resulted from Tara and Jenny's collaborative efforts is an increase in their levels of efficacy. By collaborating and being part of a PDP, they have developed collegial interactions which have produced an emotionally sustainable environment by feeding off each other's level of efficacy and, in the process, it has also engendered professional development.

Conclusion

The analyses of the classroom observation reports indicate the levels of collaboration and collegiality, from the perspective of the facilitators, between the teachers involved in this study. As the analysis progresses, a clear indication is given by the facilitators of how the levels of collaboration and collegiality and their levels of efficacy increased whilst being part of a PDP. The challenges the teachers faced are also highlighted to provide a contextual background for their personal growth and development.

The analysis of the interview transcript confirms the findings in the analysis of the classroom observation reports. The analysis of the interview transcripts correlates quite strongly to what the facilitators were observing in the classroom observation reports, regarding the levels of collaboration and collegiality and its effect on their levels of efficacy. There is also a strong correlation to the research within the literature review and the analysis of the interview transcripts. The data in the interview transcripts triangulates strongly with the data in the classroom observation reports.

CHAPTER 5

CONCLUSION

The purpose of this study was to describe and interpret the levels of collegiality and collaboration between two teachers at a school, during a PDP. The focus was on describing and interpreting the levels of collegiality and collaboration between the teachers before and whilst being on a PDP and the effects it had on their efficacy levels. The research questions are:

1. How have the levels of collaboration influenced the classroom teaching and practices of the teachers whilst being part of an in-service professional development programme?

2. How have the levels of collegiality influenced the efficacy of the teachers whilst being part of an in-service professional development programme?

This study followed a qualitative interpretive approach as the aim was to describe and interpret a social phenomenon within teaching, viz. the levels of collegiality and collaboration. Two mathematics teachers from an urban high school voluntarily participated in this study, after the purpose of the study was explained by the researcher. This school and the teachers were part of a PDP, the SPARK project, on which this study is based. The SPARK project was conducted over two phases. The first phase of the project took place from 2007 to 2009. After additional funding was provided by the funder at the end of 2009, a realigned or restructured project was conceptualised. The focus of this study is concentrated over the first phase of the project. During the project the researcher fulfilled the role as a facilitator, whilst working on the project from 2007 to 2009 at one of five schools involved in the project and with one pair of mathematics teachers. Whilst conducting this study, the author fulfilled the role as researcher. This study focused on a single group of teachers within a bounded system, viz. the project, making it a case study design.

There were two types of data used in this study. The first type of data used was the classroom observation reports, generated by the researcher whilst working as a facilitator on the PDP, from 2007 to 2009. Consent was requested by the researcher and granted by the funder for the use of the classroom observation reports as data for this study. The second type of data was a transcript of a semi-structured focus group interview done by the researcher in 2012, three years after the completion of the initial phase of the project. Both participants were contacted for the interview and consent forms for being part of this study and the interview were explained by the researcher and signed by the participants and copies were given to the participants for their records.

Levels of collegiality and collaboration

On analysing the data it was clear that there was an existing collaborative relationship between the two teachers, prior to the start of the project. This relationship evolved out of a need to improve the instructional practices of a colleague. As a facilitator who worked on various in-service projects within various schools, I do not often get to experience this deep level of collaboration amongst teachers. In most cases it is always contrived or forced upon teachers, rather than being deep and enduring; allowing it to evolve organically. This is what was observed with the mathematics teachers at Dunbar High. Establishing a deep and enduring collaborative culture does not come with a set of rules. The teachers at Dunbar High identified a problem and acted upon a solution without being forced to do so.

These teachers exhibited all the characteristics in which a collaborative culture existed. They did not see working together as a burden. They voluntarily offered up their time to work together after school and as the need arose. They were intrinsically motivated to solve the problem and not be judgemental of each other despite the professional pressures and personal challenges experienced during the first year of the project.

Their collaboration was not forced upon them by any policy; it was unpredictable and it was based purely on a personal and professional developmental level. They created their own space to collaborate and solve the challenges within their teaching. Initially, they met formally but most of the collaborative sessions were informal and, after three years on the project, they testified to the strength of their levels of collegiality and collaboration by agreeing that their relationship was still deep, personal and enduring.

By describing how their collaboration started and by explaining the dynamics of this relationship, it became more apparent that they were determined to change so that their learners can succeed and create better opportunities for themselves. They felt morally obligated towards the learners. Their collaboration was thus driven by the moral purpose of teaching, i.e. creating better opportunities of success for their learners. By focussing on the moral purpose of teaching, the nature of the relationship went beyond the collaborative to become more collegial, i.e. the relationship encompassed the professional, social and emotional dimensions.

Influence of a professional development programme

Both teachers indicated that being on the SPARK project was the catalyst needed to intensify their collaboration and explore new ideas in their teaching. In my experience as a facilitator on various PDP's, teachers found any PDP meaningful when it catered to their needs. Achieving this feat can be quite challenging but it is the only way for teachers to see the value of the programme. In-service programmes inevitably fail when it does not take into account the needs of the teachers. Professional development becomes meaningful when teachers know what the learning is for and its intended purpose. It was quite a challenge for the mathematics teachers at Dunbar High to see the intended purpose, but by taking small steps towards experimenting with the new content and teaching strategies learnt on the SPARK project, they soon realised the potential of this new found knowledge. This increased their confidence levels, which saw them collaborate more intensely to improve their levels of teaching. As a result of their increased confidence levels, their teaching became "non-routine and complex" which led to increased support for each other.

Efficacy

For the mathematics teachers at Dunbar High, being on a PDP did not establish their collaborative relationship. This was already established before the project was initiated. What it did do was intensify their levels of collaboration. They were exposed to new mathematics content, new pedagogies and a wealth of teaching resources. Because they found the PDP a meaningful experience, they felt a moral obligation towards their learners to implement these pedagogies, using the teaching resources of the project. But to do this, they intensified the frequency of their planning sessions, reflected on what would work and how best to implement them. They became reflexive practitioners. They shared a vision of what was best for their teaching and their learners. Being morally obligated to expose their learners to best practices and hence improvement in their understanding of mathematics, caused these teachers to constantly reflect on their own practice. In the classroom they tested prior knowledge of the learners before starting a new section, they allowed learners to ask questions, creating a reflective atmosphere and they always had the learners' interest at heart by voluntarily offering their help to learners during their breaks. These were all done to help the learners learn better because they saw potential in their learners.

According to Woolfolk (2007), these are traits in teachers displaying a high level of efficacy; so whilst displaying these traits these mathematics teachers were increasing their levels of efficacy. There was an improvement in grade 12 learner results, which Woolfolk (2007) claims that that efficacy is one of the few characteristics of teachers that can be correlated with learner results because teachers tend to work harder and persist longer with improving their learners understanding. They persisted and worked harder with their students, their results improved (see table 1) and so did their levels of efficacy. Whilst on the PDP, the teachers used their levels of collegiality to reinforce their existing collaborative culture, hence improving their levels of efficacy, which in turn provided opportunities for improved classroom instruction, leading to improved learner performance.

Implications of study

I can draw a number of implications from this study.

- The mathematics teachers at Dunbar High used their collaborative relationship to reflect on their teaching and refine their teaching strategies. They had a shared vision of their professional goals. Collaborative relationships amongst teachers could help teachers define a clear set of goals in terms of improving their teaching.

- It is important that teachers find ways to meet, whether formally or informally, so as to share and discuss best practice. Meeting formally or informally and staying focused is all that is needed to solve a challenge. Collaborative relationships can play an important role in improving teacher efficacy.

- Professional development programmes can be used as a catalyst in establishing collaborative cultures at schools or reinforce them by offering teachers the organisational space to collaboratively discuss, refine and reflect upon best practices in the classroom. But this can only happen if the support is sustained, coherent and meaningful to them.

Considerations for future research

This study recommends some additional considerations for future research.

- This study was undertaken with two mathematics teachers at one particular high school. The social dynamics were easy to analyse and interpret. However, having more than two teachers in a similar study would add a different dimension in terms of looking at the relationship between each teacher.

- An extended study could have been done with the other project schools and a comparison could have been made in terms of their levels of collegiality and collaboration and teacher efficacy levels. It would have allowed for some level of generalisation.

- This study was a broad study into the levels of collegiality and collaboration and its effects on teacher efficacy. Research could also be undertaken into the specific attributes of a collaborative relationship and what effect each attribute has on teacher efficacy.

- The role a collaborative culture can play in the establishment of professional learning communities of teachers. This is a crucial attribute in any professional learning community as this is where teachers collectively deal with complex problems and appropriate solutions.

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APPENDIX 1: Consent from funder of SPARK project

ZENEX FOUNDATION

Guidelines for accessing and using Zenex's research and evaluation products and processes

The Foundation is a trust which makes funds available to non-government and non-profit organisations and institutions for the benefit of disadvantaged communities, with particular reference to their educational and training needs.

The Foundation's strategy is underpinned by an evidence based approach to education development. As such it promotes knowledge sharing and partnerships when engaging with the complex and difficult terrain of education transformation. Zenex is therefore willing to share its research and evaluation reports and documents under the following guidelines:

1. Zenex will provide access to confidential information of the Foundation, service providers, schools related to the delivery of the interventions. As such, it requires that all confidential information emanating from these documents are protected and safeguarded. This confidential information should at no time be directly or indirectly disclosed without prior written consent of the Zenex Foundation. .
2. The research and evaluation products and processes should be used to enhance knowledge and cannot be used for profit making purposes.
3. Permission must be sought from Zenex for any articles, publications or presentations that use or is informed by this data.
4. Zenex must be acknowledged in all documents or presentations that utilise any of its research and evaluation products and processes.

Authorisation of use is hereby granted on the strict understanding that the reports will be used in accordance with the aforementioned guidelines.

Signed by **Place** **Stellenbosch** **Date2 March 2012**

Signed by **Place** Jhb **Date** 28 March 2012

(On behalf of the Zenex Foundation)

APPENDIX 2: Consent from Western Cape Education Department

Directorate: Research

Audrey.wyngaard2@pgwc.gov.za
tel: +27 021 476 9272
Fax: 0865902282
Private Bag x9114, Cape Town, 8000
wced.wcape.gov.za

REFERENCE: 20120411-0016
ENQUIRIES: Dr A T Wyngaard

Mr Ramesh Jeram
IMSTUS
Stellenbosch University

Dear Mr Ramesh Jeram

RESEARCH PROPOSAL: INFLUENCE OF SOCIAL INTERACTIONS AMONGST MATHEMATICS TEACHERS ON A PROFESSIONAL DEVELOPMENT PROJECT AND ITS EFFECTS ON CLASSROOM TEACHING AND LEARNING

Your application to conduct the above-mentioned research in schools in the Western Cape has been approved subject to the following conditions:

1. Principals, educators and learners are under no obligation to assist you in your investigation.
2. Principals, educators, learners and schools should not be identifiable in any way from the results of the investigation.
3. You make all the arrangements concerning your investigation.
4. Approval for projects should be confirmed by the District Director of the schools where the project will be conducted.
5. Educators' programmemes are not to be interrupted.
6. The Study is to be conducted from **01 May 2012 till 31 August 2012**
7. No research can be conducted during the fourth term as schools are preparing and finalizing syllabi for examinations (October to December).
8. Should you wish to extend the period of your survey, please contact Dr A.T Wyngaard at the contact numbers above quoting the reference number?
9. A photocopy of this letter is submitted to the principal where the intended research is to be conducted.
10. Your research will be limited to the list of schools as forwarded to the Western Cape Education Department.
11. A brief summary of the content, findings and recommendations is provided to the Director: Research Services.
12. The Department receives a copy of the completed report/dissertation/thesis addressed to:

    The Director: Research Services
    Western Cape Education Department
    Private Bag X9114
    CAPE TOWN
    8000

We wish you success in your research.

Kind regards.
Signed: Dr Audrey T Wyngaard
for: **HEAD: EDUCATION**
DATE: 17 April 2012

Lower Parliament Street, Cape Town, 8001
tel: +27 21 467 2000 fax: +27 21 467 2996
33 22
Safe Schools: 0800 45 46 47

Private Bag X9114, Cape Town, 8000
Employment and salary enquiries: 0861 92

www.westerncape.gov.za

APPENDIX 3: Consent form for participants in study

Title of Study:

Effects of collaboration and cooperation on mathematics teachers' efficacy on a school based professional development programme: A case study.

I understand that:

1. My anonymity and that of the institution I work for will be maintained.
2. I agree to be videotaped and/or audio-taped for the sole purpose of this research.
3. The purpose of this research is too primarily inform others of best practice within the teacher professional development field.
4. I realise that I may withdraw from the research at any time, without giving a reason and without any effect on my education.
5. This research will in no way be used negatively against me or the institution where I work.
6. Participation or non-participation will not be a disadvantage to me or the institution where I work.

Name: _____

Signed:_____Date:_____

SIGNATURE OF RESEARCHER

I declare that I explained the information given in this document to …….. . He/she was encouraged and given ample time to ask me any questions. This conversation was conducted in English by Ramesh Jeram and no translator was used.

_____ _____

Name and Signature of Researcher **Date**

APPENDIX 4: Interview guide for focus group interview

INTERVIEW GUIDE

1. How long have you been teaching together?
2. Describe your working relationship?
3. How has your working relationship influenced your teaching?
4. Do you meet regularly as a team?
5. How important are these meetings?
6. Does the school management allow you the space to do so?
7. What was your motivation for being part of the SPARK project?
8. How has the project influenced your levels of teaching?
9. What effect has the project had on your working relationship?
10. “True collaboration is deep, personal and enduring” How would you respond to this statement.

APPENDIX 5: Interview transcript of focus group interview with teacher participants

RJ: Interview with teachers at Dunbar High School, Jenny (J) and Tara (T) are present at this interview and they are going to be the respondents during this interview. Firstly I want to thank you for offering up your time I know it's difficult now during the examinations but I thought also this is the best time to do it because the kids won't be around you may have opportunity..{???} ...sorry if you missing out on a 50th birthday party down stairs…
T: No, they will contact us... (laughter)
RJ: Oh they will contact… no that's fine, ok. The first thing I want to ask you individually just to state your name uhh...what teaching qualifications you have and how many years you have been teaching at Dunbar High School, Tara…
T: Must I say my name as well,
RJ: Yes
T: Oh, I'm Tara I've been teaching for…this is my 22nd year here at Dunbar High School and I have four years Higher education diploma.
RJ: okay, thank you
J: okay, I'm Jenny I'm here at Dunbar, this is my 25th year and I have a three year diploma in teaching,
RJ: Now how long have you been teaching together at this school?
T & J: 22 years
RJ: 22 years
T: When I came here...
RJ: And you always taught Mathematics?
T: No, I started off with uhm Natural Science, Biology

RJ: Okay

J: and yes I started off with Maths Afr, geogs, (laughter). Can you believe it?

RJ: But when did you first start working together in the maths?

T: We had an HOD, do you remember Ms F, we had her and after she left, hey

J: after she left yes

T: hey...then how many years ago was that…quite some time ago

J: about ….more than 10 years

RJ: did you became HOD when she left

T & J: No, there was another guy after that, ja…another guy after that

RJ: Okay

T: then after that, you...

J: yes after that

RJ: But you have been working together for 22 years, but you have been teaching maths for about, I mean working in the same maths department.

T & J: yes...

RJ: for the same time?

T & J: yes…, for the same time yes...yes...

RJ: okay, can you describe your working relationship, and together...how would you describe your working relationship? I am going to ask you Tara.

T: okay, No the relationship between me and Jenny at uhh let me put it to you this way, I've been trained to teach at a primary school, right up to grade 7, but when I came here I had to teach higher grades so every year it was like climbing a ladder..so I started in grade 8, had about five/six classes of grade 9's and then I moved to grade 10 and then I said to Jenny, no I don't want to go higher, I don't think I will be capable to do that and she (Jenny) said no Tara, I will take by the hand and we will come and sit here in my class in the afternoons and she will start with a chapter and … and she would say…she would teach it to me and she would say, this is what you do here and I will write it down (softly said but very dramatically)
RJ: okay can I just ask you to speak a bit louder..
T: I will write it down and then I will go home and I will go sit with it and I will come and ask her "is this what I am supposed to do"? and "that is what I am suppose to do"? And she took me up to matric with never saying no, always available. If I was busy teaching and there was something that I just can't get to it, I will just go next door...Jenny just explain to me...always there to help, always there and that is where the bond started.
RJ: Is it..
T: yes
RJ: and yours…
J: My relationship with Tara..(laughter, shy embarrassed)…Uhm..sjoe Tara… (pause)
RJ: Did you see the potential in her?

J: Of course! Of course! There is a potential in her...there is a potential in everybody and she is a very strong teacher, a very strong, very firm teacher and she is eager to learn…and my side I like to give whatever I have.. I like to give and she was eager to get …she just needed a bit of motivation and a bit of "hulp stootjie" so that she can …just to tell she can, she can do it. She...my relationship with her … we not only have a professional relationship, we have a personal relationship also …can I bring personal stuff in here?

RJ: Ja,

J: Okay, since my husband passed away, I would like pop in and will tell her how I feel and she's always there , she's always listen and we will give advice for each other. She will like say something about her health and we will talk and will say, Tara will say I missed you because this and that and this happened …and because we don't only have a professional relationship, we do understand each other personally also. We are quite different from one another, totally different

T: Even though our birthdays in the same month...(giggle)

J: personalities, yes, even though our birthdays in the same month…So we have a heavy cheque to carry this month ... (laughter)… So, that's off the record...okay Ramesh?

RJ: Fine… (laughter all round)

J: So yes, so uhm we are totally different. The thing about Tara, she's very prim and proper, and I tell her I wish I can be like that but I can't be like that. But I learnt a lot by her asking me questions and they I say okay I will find out I will see if there is a different way to teach it. So if she doesn't come to me and if I have a problem, I wouldn't know if she needs help…and by helping her I learnt quite, quite a lot, quite a lot.

RJ: So this relationship how, how…I mean you (Tara) have been saying that she (Jenny) took you by the hand and she guided you through the process..you (Tara) got something from her and Jenny got something from you in return. I just remember 2007 was quite a watershed year for you (Jenny)…in the sense that that was the first year of the project...

J: Mmm…yes first year of the project

RJ: You were off for the entire year…and your husband passed away...

J: No I was not off for the year...

RJ: yes, but in the reports…

T: yes but you popped in …

J: yes, yes, yes

RJ: yes but if you look at the reports and you look at the first term and then you only came back in the fourth term, I think after that Mr. M, remember he still came in 2007, that time… How was that year for you (Tara) when she wasn't around?

(7:31)T: When she wasn't around...okay uhm… you know, I, I if I think back now, in the beginning I thought ...man…what am I going to do? She had matriculants and they never had a teacher. At a certain stage they didn't have a teacher and I thought to myself now you need to do two peoples work, right, the principal was struggling to get a teacher to come, so what I did was I allowed the matriculants to go and sit next door in the classroom and I would teach my group of pupils…they didn't get at the same time the maths at the same time so I will come and teach my class, whether it was a grade 9 class whatever, then I will give them an exercise to do and then I will go next door to teach the matriculants.

And I was running like this from one class to the other class and my responsibilities became a lot more because where we shared of question paper setting and stuff and all those things, it became my responsibility. So for me it was a tough year but I knew what she was going through, so I didn't have a choice and I just had to be strong and just get the job done. So I was doing that but nobody in front {pointing to administration block, referring to principal and management team) came to thank me personally. At the matric ball at the end of the year, the maths matriculants they stood on the stage and they said we are thanking Tara for her sacrifice. They thanked me.

RJ: I'm glad you picked up on that point uhmm… so you saying the school management just left you on your own devices basically…

T: Yes, there wasn't any teacher so what must be done must be done. We are going to leave it up to and so see what you going to do. So I was constantly, I think I lost a lot of weight that year, so I was constantly, I can almost say, running from one class to the other. And when I had a free period I would go and ask the matriculants group…uhmm…is your teacher absent? (in a period other than maths period) Can you afford to come to me? And then I will sit here and I will teach them. And they had to adapt to my way of teaching as well, because they were… {???}.

RJ: I want to ask you Jenny what was going through your mind at that time in 2007. I know you had a lot to deal with.

J: Absolutely nothing, to tell you the truth. That was not a very good…I don't know what happened in 2007. I actually have to …when the year passed I had to think did this year pass actually. I wasn't thinking about school work…of course I was…Tara knew I was worried about them. But I'm now listening to Tara and I knew she was doing that. But because we also had this relationship with each other she was glad to do it. She wanted to do it out of her own; the principal did not ask her to do it. She...it wasn't her job to do it. They had to get another teacher. But I knew that…that… things would come right here in my place but I knew also personally I needed that time.

And I must tell you Ramesh that I 2007 was…I couldn't believe I came back to school with all… a week after…two weeks after I came back to school, uhmm …even coming to the ZENEX (SPARK) project I was asked…I went to the principal and said I don't know if I must go to the principal because of my period that I must go through. Then he said its part of your work, you must go, you can go. Because of my mourning period that I had to go through and uhmm I said okay I will go…that I will go. It was difficult in the beginning but the rest of the year I was like not there…I was emotionally somewhere…spiritually somewhere…somewhere else…somewhere battling with my feelings and getting over…trying to deal with it.

(11:56)RJ: I'm picking up on…the next question I wanted to ask was how has your working relationship influenced your teaching?... but I think you brought that up already by Jenny taking you by the hand but you also helping her out during that period of time so…it was because of that relationship that you had with each other that you sort of knew that you could depend on each other?

T: Yes, most definitely yes

J: most definitely yes, we can depend on each other. I remember that was the same year I left just before the exams, so I had such a lot of marking to do. That was when I came to yous… was it? And I came back to them and I had a meeting …I was off sick…and I had a meeting with the team and I told them I cannot concentrate on my marking …I can't do my marking. And I asked them for their help…and they like distributed to all the papers amongst them and uhm the marking got done and I did not do anything because I couldn't …I really couldn't.

(13:06) RJ: That first period of the SPARK project from 2007 to 2009, the two of you were basically the mathematics department.

T & J: yes, yes

RJ: for 10, 11 and 12, if we look at it that way. How often did you meet and how did you meet? Was it formally, informally or did you have special time that you met as a mathematics department? Tell me about those meetings.

T: The two of us?

RJ: yes…

T: oh, it was different ways hey!

J: Just the two of us, not the team?

RJ: Ja..

T: It was very informal

J: Very informal…very informal. We would like the afternoon sit and I would like say we first discuss how far we are with the work? Are we on par? I would say like "Tara I'm here, are you there, are we going to be finished with that next week? Yes? What test are we going to be writing because we wrote a test every Friday. Now I will tell Tara, I will set up the test, this is the test, and every Friday I'll have the test ready for her and then we'll meet very informally but very..uhmm…speaking about the work also, almost all the time speaking about the work. And then we'll also meet when Tara says or I says "how can I explain this in another way, I just can't remember this work again. The we'll sit together and discuss it, and then I will tell her that I'm not satisfied with the way we going to teach it or whatever, and I'll sleep over it a day or two then I'll just get something…(laughter/giggle).

T: She will go through books and she will find the easiest way to get to explain the work to them.

J: Yes then I will get back to her and explain to her what I found out. And I must say that this past three…four…five years were …we learnt quite a lot, quite a lot. This was the most productive time in our teaching career.

T: Yes!

J: the most productive time

T: Defintely, definitely

RJ: So you met more informally but it turned out to be formal, in a way…

J: It turned out to be formal, yes

RJ: because you would talk about teaching strategies .

J: Yes it wasn't like making…keeping uhmm…wat is die woord wat ek soek…

RJ: Record?

J: Keeping record…

T: Notes ja…

J: It's not on record, not keeping records, well that is one of my very weak points there…not keeping records {laughter}

(15:34)RJ: I mentioned about the school management, so it wasn't that…and you can say whether I'm right or wrong…it wasn't that the …do you have a special…does the school have a special time for faculties to meet or departments to meet?

T: We used to have it on a Wednesday afternoon hey.

(15:54) J: We used to have it yes.

T: But now we have the extra classes with the matriculants and now we can't have it anymore.

RJ: Would you say that's the reason why you meet more informally than formally?

T & J: Yes

T: Because we use to have that meaning every Wednesday afternoon.

RJ: Ja…and that was for the whole faculty…the whole department

T: Yes

J: The whole department…faculty

RJ: and you would do the same thing you just spoke about now…talks about at what point you are...

T: Yes

J: At what point you are...

T: for each grade

J: yes

RJ: I want to ask you individually…Tara… what was your motivation for being part of the SPARK project?

T: My motivation….Ramesh because I was trained for primary school hey…I needed, I really needed to know more, to be able to teach up to grade 12. It was just that gap, it was a major gap and then SPARKS (sic) project came and that was it that I was waiting for. Because besides Jenny, I didn't have any plans to go and further my studies, not at that point in time. So when the SPARK project was there this is what I needed, at the right time… at the right time.

RJ: and you Jenny?

J: Jenny …okay…uhmm..

RJ: I know it came at possibly the worst time in your life… (laughter)

J: Yes it came at worst time of my life…It doesn't matter for that, I needed to do that. Not because I was the HOD, not because I was the HOD, because it was something new…something new that we part of. I think it's the first project that we as a school was part of and we were also starting the new syllabus I think, I really needed guidance in there…I needed guidance and I felt that I need guidance so that I can guide my…my team afterwards…uhmm and
RJ: Has that worked?
J: Yes…gom jirre Ramesh it worked {laughter/sigh of relief}…you will never believe how it worked.
T: Yo! Oh
RJ: I weant also ask and I think you sort of mentioned that now…how…you did mention about the fact it has helped you a lot…but give me some sort of idea to what level has it taken your teaching to… the SPARK project?
J: The SPARK project okay. Firstly …gosh there is such a lot…okay firstly the content okay. We have more knowledge of the content…and not just the content…just the content as it is but where it comes from…the basic things where does the formula come from. Then the different methods in teaching a certain topic which was quite uhmm…you were letting my thoughts run around. I was still looking at how you explain things thinking okay…okay he can do that. I'm going to try something like that but I'm going to do it a bit different, so that it can for the learners. And we've never had something like that. We had to find different ways of teaching a topic…uhmm…personally Ramesh, We, I learnt quite, quite, quite a lot, quite a lot. And with that I also met different teachers from other schools and I knew what problems they had and so my problems were not problems at all because of uhmm…the resources that they had at that schools before the SPARK project was quite, quite less than what I had. I could exchange, I could help them with books and uhmm I actually know more teachers…mathematics teachers than before.

(19:55)RJ: The question I asked uh…I just need to get a sense …and you mentioned that you learnt a lot from the SPARK project…but to what level has it taken your teaching to?

T: Huh…Ramesh! (exclaiming breathlessly)… for me it was just amazing, just amazing. The amount of knowledge that I had, to the amount of knowledge after the project or during the project; it's such a major difference Ramesh. I learnt things I never thought of before, you know. Logs and exponents and things I have never been exposed to it, never. When you are being trained to teach at a primary school it's just up to certain level and that's it. You know, even your examinations at the college, and now it's like a different world opening, now I see things and people are explaining things that I never thought of. The angle that they explain it, I never thought of that. It excited me (excitedly said).

RJ: I...I also want to ask you that ….has it…you spoke about your working relationship before. What has it done…what has the SPARK project done to your working relationship? Has it intensified it, is it still the same or do you do things differently now … what has it done to your working relationship?

J: Working relationship…the two of us?

RJ: Ja

J: No we are working… ("don't understand question" laughter)... we are, I think…

T: It intensified…

J: Yes, yes…intensified

T: we could talk about it even more, you know…

J: Yes...

T: Talk about ways of …okay we will take this little bit and put our own things to it, and make it work for us and the pupils. So it definitely (voice raises) intensified.

J: We had a lot more of extra things to talk about. Say for instance we had our textbooks, our textbooks that we had and then we had the SPARK notes and the SPARK uh things that you gave us. And then we will look at it and say okay I can use this for an investigation. Then I will sit with it and say Tara, are we going to do this or what? Okay let us sort something out here, then we do that. So uhm, yes our relationship, we were much closer after that.
T: Mmm…mmm…{affirming what Jenny said}
RJ: And the rest of the members in your faculty, how did you begin to share information with them?
T: No, we started sharing right from the start hey, but not to that extent hey.
LL: Not to that extent, because we were busy with grade 10, 11 and 12, we were busy with the FET and the two of us are alone in the FET. The others were a bit scary to get into the FET. I think what happen during the first year of the project we had all the teachers in the project and I was so disappointed when the project decided just to take the FET teachers. Because I actually wanted all my teachers to be at that; to know the grade 8 teachers to know what is being done in grade 10, 11 and 12. So the teachers were a bit scary to get to grade 10, until I asked them to get to grade 10 and like with Tara, we coached them, we helped them through the year and uhm we shared yes, we shared yes…uhm…uhm…the thing there also is we could see that… we could go back to the grade 8 and 9 before the project also and tell them listen here concentrate on this, we need this because of the new syllabus, because of the new syllabus we could cut out the work in the grade 8, cause through the project we had more knowledge of the new syllabus. We started with grade 10, I think, 11 and 12, because we had more knowledge of it, we knew what must be done in grade 8 and grade 9. So there we guided, we guided them uhm in that part.

(24:10)RJ: Did it…did your …you sat together, you developed teaching strategies you decided okay we're going to do this. What effect did it have on the learners? Did you…could you see a change in the learners' behaviour? Were they more interested in what you were doing? Tell me about how the learners reacted when you tried something new.

J: Usually when I try something new, I don't tell them it's something new. I try it and they will just catch it just like that. Then I will tell them how I use to do it before. Then I will do whatever explanation, I will do it after that and then they said, Miss no but the first one is better. Then I will say you know I discussed this with Tara, we discussed it and we decided to do that. So then I do it again with you. So whatever we discuss, the way in which we teach, the learners {raising voice} could see our relationship, they could definitely see. I would like come to her class and I would ask how are you today…are you listening…you have a good teacher so I wanted to see work, I'm looking at your marks, I would come to her. And if I have a problem I would tell them just come speak { request to Tara} a little bit with them about their work and that that. They {learners} know the relationship that we have…they know.

T: And you know they have the…they feel free…

J: Mmm…{affirming}

T: If Jenny is not there they will come to me…if they want to know something, and even my

J: Yes…because of our relationship, the learners are not scared to tell her or me but uhm...you know Miss I went to Tara and Tara explained this to me, I understand. Or her (Tara) learners come to her and say they came to me.

T: Mmm…ja…

J: They would really feel free to say that.

(25:57) RJ: Your school has shown the greatest improvement in results, matric results. I want to ask you and answer as honestly as possible. What do you think attributed to that gradual increase in results? I mean when I started working with you people your results were like 30 odd % pass rate.

T: Ja

RJ: Uhmm…at the end of 2009, you already shot up to about a 50 odd % pass rate then, and of course at the end of 2010, you got this 72% pass rate. But there's definitely this gradual increase. What do you attribute that to? I want to ask you Tara, in your opinion, what made the difference?

T: Ramesh..uhmm..when we became part of the project it was a confidence(clicked fingers in air) boost man, honestly. I was standing in front of the class and I know exactly what I wanted to teach and I think the pupils could pick that up, you know. That change, the easier ways to teach it. Uhmm…letting them enjoy maths more because you enjoying it more because you know more. And you feel good about that.

RJ: So you are saying that when you never really had the confidence, the learners could pick it up?

T: I think so, I think they do pick it up.

J: Learners can definitely pick it up

T: Aah they do

J: definitely

T: they pick it up. They will come and tell you but that teacher is not sure of him or herself because of this that and that…they pick it up.

RJ: And what does that do to their levels of confidence?

T: No, the way they feel about the teacher, that changes.
RJ: Do you agree with that Ms (Jenny)?
J: Yes I agree with that. If the teacher doesn't show confidence in front, the learners will never be confident in themselves also. I always tell my teachers be prepared in your class and show the learners you know your work. Of course you can make mistakes but you must be so confident there in front. And with the project Ramesh, we were more than confident because we knew what's waiting, we knew what's lying ahead. We knew exactly where the pitfalls are going to be. So if a question is gonna come we know you can throw a question and give you an answer you'll be satisfied with. Uhm…like Tara said that it was a confidence booster , really, and the learners could see that.
RJ: But that would not have happened if it wasn't for your relationship. I mean that levels of teaching, that new confidence levels, the…
T & J: No…
RJ: So that played a major role
J: A major, major (exclaiming!) role. Like I said we not just on a professional basis, we are personally also talking about our lives and how are you today.
RJ: I want to ask you…it may sound like a rhetorical question or maybe you answered it before but I want to ask you why? Why did you sit together…it was so easy for you just to carry on what you were doing with, going through the motions, you know doing the same thing year in and year out. Why did you feel that you needed to change like that?
J: What do you mean needed to change like that?
T: What is it the relationship?

RJ: No, no, no … what was…maybe I should rephrase that…Did you feel a sense of responsibility towards the learners? Let me put it that way.
J: We always felt a sense of responsibility towards the learners. But because like I said previously because it was new syllabus the responsibility was much (stronger??)
RJ: Which is what I'm saying to you, you could have just carried on…
J: yes, yes, we could have just…
RJ: doing the same thing, doing that over and over again and hoping for the best
T: Ja…
J: I understand what you mean
RJ: So what was it in you that said you know what we can't go on like this anymore? What was that one moment?
T: Jenny … do you remember when we started with that new syllabus, the grade 12 pupils that we had, that Joe them … those pupils. How did we feel about teaching then...Huh!
J: (laughing embarrassingly)
T: We were like blind people, hey! Didn't know what to concentrate on where to touch! We felt totally lost. And we talked about it hey, and when we started with the project and we looked back, what did we say: Huh, what did we do to the pupils (totally embarrassed, shocked and remorseful), what did we do to them!!
J: Oh how we wished we knew that last year!
T: What did we do to them!
J: Yes we said that…

T: We talked about that and we said: The financial maths, do you remember? What was it uh…uh…effective….
J: rates…
T: and that and We would just …(shock and embarrassment)
J: we would say…we would say …(embarrassed laughter at what was done) now we'd get together, now we would explain this…It's so easy, jissie Tara (voice raised)…Huh! (exclaiming loudly) what did we do last year with the kids?
T: Huh…(hand over face, still embarrassed about what they did together)
J: They can't remember what we did with them. But like you said every year there was something new that we learnt and it was for the benefit of the kids. I think it's because we are…we are teachers, we are persons that see the kids as the main role player here and
T: Mmmm…(affirming)
J: doesn't matter what we have to go through but they are the persons that must benefit here, they are the persons that must learn. And we as teachers we must try our best so that they can understand what we saying, so they can understand all the steps and whatever. And so they can enjoy of course, they can enjoy it of course…(Laughter, satisfied). Because the learner must enjoy the class.
T: Ja
RJ: I want to ask you a final question. In fact it's a statement and I just want you to comment on it. It's a quote from an article that I read and it says here that : True collaboration is a deep… is deep, it is personal and it is enduring. True collaboration is deep, personal and enduring. What do you…how would you respond to that statement? Tara…
T: Come back to me Ramesh

RJ: Okay…Jenny? Is it…okay do you agree with this statement?
J: Yes, I agree fully, I agree fully with that statement. Deep, personal and enduring…we've been through a lot. We've been through a whole lot; deep things and I'm talking about on a personal level, on a personal level and because we knew we could trust one another, then the relationship just grew stronger. Uhmm because of the persons, and she had to endure a lot (slight giggle). I would like , I would come if I had a problem with the learners or if …do you remember (to Tara) that grade 10 class I had, they will like say such funny stuff…
T: Mm..Mm..
J: And I would say, Tara I must tell you this…It was just to keep my sanity going. Like a learner saying, you saying theta and that is adjacent and then he would say: Miss every used his name Peter and Jason's name, when is Miss using my name…
T: (laughing uncontrollably)
J: And I would come just to keep my sanity, and that boy was serious, he was so serious about that, he was so serious. Just to keep my sanity I had to come and tell her about everything that is happening in my class, just get a laugh {both teachers laughing uncontrollably}. And she had to...well she did not have a choice, she had to listen.
T: No but I did not have a problem listening, honestly. It comes naturally hey, from both sides, it comes naturally.
T: comes naturally yes
RJ: But you also agree with that statement?
T: Yes
RJ: Collaboration is a deep, personal, enduring thing.
J: Mm..
T: Enduring as well…ja definitely

J: Mmm..
RJ: And I mean at this point, it still works for you guys?
T: It does... (excitedly)
J: I think it depends on the type of person you are. Should be a type of persons with a lot of patience. Both of us we have a lot of patience and it depends also what your relationship…what do you think about the next human being, not just the next teacher, what is your feelings about the next human being, what respect do you have for that teacher. And uhm … that's it. We have mutual respect, we working together very nicely, very nicely.
RJ: Are people envious of your relationship?
T: I wouldn't know that, I wouldn't know that …(hesitance)
RJ: Okay you don't have to answer that question if you don't want to.
T: Ja..(loudly and approving)
J: (hesitant) … I would think so, I would think so and there I'm a bit disappointed in myself that I don't have the same relationship with some other teachers. I thought about this, thought about this already and I would think…uhm… Jenny you need to have …you can't have the same relationship but you need to work towards that. But then again what I mentioned just now is the type of person you are man, the personality you have.,
T: Some people make it very easy for you, you know. Others will go out of their way to make it difficult for you. So it's…(laughter)… different personalities. But you know Ramesh, we are very, very open and Jenny she knows she can come to me with anything. Whether it's problems in the department and she knows it will not be discussed with anyone else and it's nice to know that that person has that …you know.

RJ: And management, how do they deal with your working relationship. How do they view it?

T: You know when Jenny wasn't here, the principal called all maths teachers together and he said to me he would like me to take charge. Now there's guys, there's older guys, you know, and you would think that okay he would ask them to do it. So I had to attend meetings, so when it was the HOD meetings I had to attend the meetings and come back to the team. And I think many of them started accepting that for the time that Jenny wasn't there. Up to a point that they will sometimes still come and ask me certain things right. But I could feel that there were some of them that were not happy with that, they thought why not me, why not me (expressing what the others thought). So..ja

J: No I told the principal he can ask you to …because I knew you could it, I knew you could do it.

RJ: Ladies I want to say thank you very much for firstly being…giving up your time, but also being very open, honest and frank. I am sure that I have got more than enough information here. Rest assured that I will be sharing the results of my research with you as such and also the outcome of it so maak maar DUaa (laughter). Thank you very much ladies.

T & J: It's a pleasure Ramesh, it's a pleasure. We've worked together very hard. Ek kan nie anderste but om ja te sê Ramesh

APPENDIX 6: Sample of SPARK project classroom observation reports used in data analysis. For ethical reasons, these reports have been modified by using pseudonyms for the name of the school and the names of the teachers and facilitators, other than the researcher.

CLASSROOM REPORT

SUBJECT	Mathematics
DATE	19 April 2007
FACILITATOR/S	Ramesh Jeram

Planned outcomes for project

1. **Empowered, equipped and motivated teachers**
2. **Effective teaching methodology and improved classroom practice**
3. **Lessons that are more structured, resulting in a significant increase in learners that are adequately prepared for higher education in Science and Engineering**
4. **A significant increase in learner numbers in Mathematics and Physical Sciences at the target schools**

Facilitator report to the coordinator: SPARK Project

School	**Visit** **1st**	**Date** **19April 2007**	**Teachers** **Jenny (gr.10 & 11)** **Tara (gr.10 & 11)**	**Principal**
Contextualisation	Arrived at the school at approximately 8:30. As this was my first visit, I introduced myself to the principal and discussed the following: • Aim of the classroom support visits for the SPARK project • Visit roster for the rest of quarter • Progress of educators attending workshops • Common examinations for grade 10 and 11 Mathematics • Strong possibility of strike disrupting schooling. Need to put structures in place to counter effects of strike.			
Format (nature) of visit	1st The format of this visit was to create a baseline assessment of the educators on the project. This included : • Observing the educators in their classroom with emphasis on didactical approaches of each educator • Establishing what existing structures are in place and what are their needs and requirements for effective teaching and learning in 2007 I observed only both educators. The following is noted: • Grade 10 educator was busy with factorisation. Excellent approach by doing revision of products. Grade 11 was busy simultaneous equations. Grade 11 has low learner numbers and therefore the educator could concentrate on each learner comfortably. Excellent discipline displayed in both classrooms.			

	• Teacher's portfolios are very well organised. Both display excellent management of their teaching and classroom. • Learner portfolios also well organised. Completed three activities for assessment thus far. Dutifully recorded also. • Planning complete for 2nd term • Have not used any material from SPARK workshops.
Planned outcomes for the SPARK project for 2007	• **To broaden the knowledge base of teachers focusing on selected content areas.** • **To develop an understanding of selected (basic) concepts in mathematics.** • **Able to effectively use mathematics resources** • **Demonstrate an understanding of assessment** • **Be able to manage different forms of assessment** • **Be able to develop CASS items** • **Be able to manage portfolios** • **Development of a mathematics culture at school** • **Development of mathematical language usage by learners** • **Demonstrate innovative work of both learners and teachers** • **To meet with principal and mathematics teachers** • **To get some background of the school and specific problems** • **To offer classroom support to mathematics teachers** • **To do classroom visits at each teacher for grades 10-12, in order to observe didactic methodologies**
Real outcomes	• Met with educators to establish their needs • Met with principal and HoD to outline any challenges the school may be experiencing.
Measuring of actual outcomes.	• Classroom visits • Discussions with educators
Nature of assessment	N/A
Conclusion	A fruitful visit which gave me an idea of how to structure and plan future visits. These educators are competent, confident and display a passion for their subject. They are well organised in their teaching approach and display an excellent working relationship. In am looking forward to working with them.
What are the challenges?	• Large classes (gr.10) • Motivating educators to excel in their teaching.
Recommendations/ Needs	Need assistance with : • Approaching certain sections of the work via demonstration lessons • Activities that will stimulate learner interest

CLASSROOM REPORT

Planned outcomes for project
1.1 to empower, equip, support and motivate teachers
1.2 to improve classroom practice by implementing effective teaching methodologies and formative assessment
1.3 to structure classroom teaching and lessons for effective learning, resulting in a significant increase in learners that are adequately prepared for higher education in Science and Engineering
1.4 to significantly increase the learner numbers and performance of learners in Mathematics and Physical Sciences at the target schools

SUBJECT	**MATHEMATICS**
DATE	30 July 2007
VISIT	3rd
FACILITATOR/S	Ramesh Jeram

<table>
<tr><td>Contextualisation</td><td colspan="3">Arrived at the school at 8:30 am. School had an assembly. First period started at 8:45 am. School was functioning normally.</td></tr>
<tr><td>Format (nature) of visit to principal</td><td colspan="3">Met with principal and gave him a copy of the visit roster for the third term. First period started at 8:45 am. Outlined focus of visits for the term Following was discussed:
Jenny is currently off on sick leave for the term and could possibly not return. Currently looking for a replacement as she has grades 10, 11 and 12. Concern for grade 12’s but Tara is currently sharing this load. Only educator that was visited by facilitator.
Examinations took place, despite the strike. School was operating normally during this period.
Suggested that part of the focus of the third term s get portfolios of learners completed. Facilitators will make every effort to assist.
Suggested the principal contact facilitator when new educator is appointed, so that the facilitator can offer assistance with planning and developing teaching resources to cover backlog of work.</td></tr>
<tr><td rowspan="5">Format (nature) of visit to teacher/s</td><td>Name of teacher</td><td colspan="2">Tara</td></tr>
<tr><td>Grade</td><td>Expected no of learners:20</td><td>Actual no of learners:20</td></tr>
<tr><td>Topic</td><td colspan="2">Graphs</td></tr>
<tr><td>Contextualisation</td><td colspan="2">No behavioural problems but intellect of learners is varied. Small class. There are sufficient desks for learners and the classroom is neat and tidy. Few posters on wall but the atmosphere is comfortable and conducive to learning.</td></tr>
<tr><td>Planning</td><td colspan="2">Educator is currently checking learner portfolios for moderation. She has taken on the responsibility of doing Jenny’s classes portfolios. Prep work is very</td></tr>
</table>

		well structured and organised in files and readily shares resources with other educators.
	Teaching methodology	Required assistance with teaching functions. Assisted the educator in drawing up a worksheet to cover the content. Discussed methodologies and demonstrated a suggested teaching approach to the grade 11 class. Lesson was interactive and learners responded well to questions. Drew up a similar worksheet for grade 10 class.
	Implementing resources	Will be using the IMSTUS material in future lessons on functions. Encouraged educator to use resources as part of her planning.
	What did they learn? Method/technique/ assessment tool	No formal assessment was done during the lesson but the work was constantly checked during the lesson. Learners were also actively engaged in discussion which facilitated learning of concepts and processes
	Challenges	Currently having to cope with additional workload due to absence of other educator. Need to find replacement as soon as possible.
	Recommendations and planning for next visit	Focus on : • Completion of learner activities, development of CASS items. • Assistance with completion of content according to pace setter. Helping educator to create time frames. • Give demonstration lessons or co-teach with educator. • Focus on preparing learners for grade 11 external examination.
	Reflection, stories, comments	Moderated a few scripts of learners who wrote common June examinations. All in order. Disappointed in grade 10 results for common examinations but was pleased learners went through the process. Grade 11';s results were fair, highest symbol a B.
	Teacher's professional development plan	No assignments submitted thus far as evidence of professional development.

CLASSROOM REPORT

Planned outcomes for project	
1.5	to empower, equip, support and motivate teachers
1.6	to improve classroom practice by implementing effective teaching methodologies and formative assessment
1.7	to structure classroom teaching and lessons for effective learning, resulting in a significant increase in learners that are adequately prepared for higher education in Science and Engineering
1.8	to significantly increase the learner numbers and performance of learners in Mathematics and Physical Sciences at the target schools

SUBJECT	**MATHEMATICS**
DATE	2 October 2007
VISIT	6th
FACILITATOR/S	Ramesh Jeram

Contextualisation	Arrived at approximately 8:30 am. School was functioning normally.		
Format (nature) of visit to principal	Informed principal that the focus of my visit was to continue my classroom support and discussions with educator. Jenny has returned and is currently catching up with the work. Tara is assisting her. Informed principal of progress of educator and was pleased by the assistance offered by the facilitator thus far. The focus for this visit was on planning and no lessons were observed. Spent the day with educators assisting with planning for 4th term and moderation.		
Format (nature) of visit to teacher/s	**Name of teacher**	**Jenny and Tara**	
	Grade 10 & 11	Expected no of learners N/A	Actual no of learners N/A
	Topic	N/A	
	Contextualisation	N/A	
	Planning	• Educators are struggling to complete syllabus due to time lost during strike. • Linked exercises in the workshop modules with content to be completed. • Prepared activities to cover content and complete assessment for learner portfolios. • Set time frames for completion of content.	
	Teaching methodology	N/A	
	Implementing resources	Shared resources with educator to cover certain sections of the work.	
	What did they learn? Method/technique/ assessment tool	N/A	
	Challenges	• Being able to adapt after such long leave is a	

		major challenge for Jenny. Substitute educator has covered certain sections of the work. But I have no doubt that using the excellent support base of the other educators, she will adapt. • Currently catching up on the backlog of assessment activities for learner portfolios. • Being able to complete the content in one month.
	Recommendations and planning for next visit	Facilitator to monitor progress of educators in covering content and completing syllabus.
	Reflection, stories, comments	Thanked the principal for allowing me onto school premises. Expressed his appreciation by thanking me.
	Teacher's professional development plan	No assignments submitted thus far as evidence of professional development

CLASSROOM REPORT

SUBJECT	**MATHEMATICS**
DATE	6 February 2008
VISIT	1st
FACILITATOR/S	Ramesh Jeram

<table>
<tr><td>Contextualisation</td><td colspan="3">Arrived at the school at 8:30 am. Staff had staff meeting and first period started at 8:45. School was functioning normally, i.e. had all the periods albeit shortened.</td></tr>
<tr><td>Format (nature) of visit to principal</td><td colspan="3">Met with principal and the HoD, Jenny, and held brief discussions with them. The following is noted:
Appreciated the project inputs thus far and noted the positive changes especially amongst the attitudes of the educators.
I suggested they allow educators to move up with their classes, as research has shown that this formula is one of the ways of ensuring successful Mathematics results.
Commended the principal on the excellent discipline at the school.
All educators have a certain amount of textbooks, which learners have to share due to insufficient amounts of book.
Mathematics results for matric 2008 were disappointing. Only 29% of learners passed SG mathematics in matric The overall pass rate for matric also dropped from 80+% to 69%
Mathematics classes are dwindling due to learners not choosing mathematics as a subject.
Despite the many challengers, teachers are in their classrooms teaching and the learners are working.</td></tr>
<tr><td rowspan="4">Format (nature) of visit to teacher/s</td><td>Name of teacher</td><td colspan="2">Jenny</td></tr>
<tr><td>Grade 11D & F</td><td>Expected no of learners 33</td><td>Actual no of learners 28</td></tr>
<tr><td>Topic</td><td colspan="2">Surds</td></tr>
<tr><td>Contextualisation</td><td colspan="2">Jenny has 2 grade 11 classes and one grade 12 class for mathematics. Numbers in each class are approximately 38. Some classes are a combination of two different classes. No behavioural problems but intellect of learners is varied. There are sufficient desks for learners. Classroom is neat and tidy. Few posters on wall and the environment is comfortable and conducive to learning. Shares grade 12’s with Tara.</td></tr>
<tr><td>Planning</td><td colspan="2">All Learning Programmes and Work Schedules were done in the cluster meetings. Educator has a definite idea of what and when to teach. Lesson planning will be done at workshops, in conjunction with content. The educator and learners are currently working from a textbook.
Educator is progressing well with her teaching and content.
Suggested learners were issued a copy of the</td></tr>
</table>

		year plan, which they should paste in their books, setting out time frames for completion of content and assessment activities.
	Teaching methodology	The lesson was very much "talk and chalk". Activity was done with educator and learners together. Showed excellent questioning skills which created a discussion with learners, who responded well to questions. Despite using an activity from the textbook, approach was more of a facilitator than educator.
	Implementing resources	Text book activity. Have IMSTUS resources as part of their teaching resources for 2008.
	What did they learn? Method/technique/ assessment tool	No formal assessment took place during the lesson but an exercise containing problems were given to apply what they learnt. Learner's books were marked/checked whilst doing the activity and exercises.
	Challenges	❖ Low levels of literacy amongst learners had learners struggling to understand the terminology in the activity. Educator showed the patience and understanding by slowly going through the activity. ❖ Limited amount of textbooks. Learners are currently sharing a textbook. ❖ Unsuccessful learners, from a previous grade, that have been promoted to the mathematics class, under the instruction of the WCED curriculum advisors.
	Recommendations and planning for next visit	Jenny has been teaching mathematics for approximately 10 years at the school. She is confident and competent to teach Mathematics and very organised in terms of knowing how to do what and when. Will be checking on progress of work and work schedules during next visit.
	Reflection, stories, comments	There is a close working relationship between the mathematics educators at the school. They meet regularly and are always willing to assist each other. They plan well together and they are always prepared to tackle new challenges.
	Teacher's professional development plan	The educator's confidence levels have grown in leaps and bounds. Everything must be done to support these levels of enthusiasm and motivation.

Format (nature) of visit to teacher/s	**Name of teacher**	**Tara**	
	Grade 11A Grade 10I & F	Expected no of learners 17 Expected no of learners 27	Actual no of learners 17 Actual no of learners 27
	Topic	Gr.11 - Surds Gr.10 – Interval Notation	
	Contextualisation	Tara has three grade 10, one grade 11 and one grade 12 class for mathematics. Numbers in each class vary from approximately 17 to 40. Some classes are a combination of two different classes. No behavioural problems but intellect of learners is varied. There are sufficient desks for learners. Classroom is neat and tidy. Few posters on wall and the environment is comfortable and conducive to learning. Shares grade 11's & 12's with Jenny.	
	Planning	All Learning Programmes and Work Schedules were done in the cluster meetings. Educator has a definite idea of what and when to teach. Lesson planning will be done at workshops, in conjunction with content. The educator and learners are currently working from a textbook. • Educator is progressing well with her teaching and content. • Suggested learners were issued a copy of the year plan, which they should paste in their books, setting out time frames for completion of content and assessment activities.	
	Teaching methodology	The lesson was very much "talk and chalk". Activity was done with educator and learners together. Showed excellent questioning skills which created a discussion with learners, who responded well to questions. Despite using an activity from the textbook, approach was more of a facilitator than educator.	
	Implementing resources	Text book activity. Have IMSTUS resources as part of their teaching resources for 2008.	
	What did they learn? Method/technique/ assessment tool	No formal assessment took place during the lesson but an exercise containing problems were given to apply what they learnt. Learner's books were marked/checked whilst doing the activity and exercises.	
	Challenges	❖ Low levels of literacy amongst learners had learners struggling to understand the terminology in the activity. Educator showed the patience and understanding by slowly going through the activity. ❖ Limited amount of textbooks. Learners are currently sharing a textbook. ❖ Unsuccessful learners, from a previous grade,	

		that have been promoted to the mathematics class, under the instruction of the WCED curriculum advisors.
	Recommendations and planning for next visit	Tara has been teaching mathematics for approximately 10 years at the school. She is confident and competent to teach Mathematics and very organised in terms of knowing how to do what and when. Will be checking on progress of work and work schedules during next visit..
	Reflection, stories, comments	There is a close working relationship between the mathematics educators at the school. They meet regularly and are always willing to assist each other. They plan well together and they are always prepared to tackle new challenges. Set mathematical challenge to learners which educator will monitor.
	Teacher's professional development plan	The educator's confidence levels have grown in leaps and bounds. Everything must be done to support these levels of enthusiasm and motivation.

CLASSROOM REPORT

SUBJECT	**MATHEMATICS**
DATE	12 March 2008
VISIT	2nd
FACILITATOR/S	X

Contextualisation	Arrived at the school at 0815 am. School was functioning normally.		
Format (nature) of visit to principal	The principal was busy and could not meet with me, as was his deputy. There seemed to be many learners outside of their classrooms		
Format (nature) of visit to teacher/s	**Name of teacher**	**Jenny**	
	Grade 12 C&D	Expected no of learners 38	Actual no of learners 38
	Topic	Arithmetic series	
	Contextualisation	Classroom is neat with some graffiti. Few posters on wall and the environment is comfortable and conducive to learning.	
	Planning	Jenny had planned to finish off arithmetic series today and move onto geometric series.	
	Teaching methodology	Talk and chalk was the methodology. Learners were also asked to write their answers on the board in succession. Three did so unsuccessfully. Jenny patience is to be commended but at the same time she is about a month behind the pacesetters.	
	Implementing resources	Text book activity.	
	What did they learn? Method/technique/ assessment tool	No formal assessment took place during the lesson but an exercise containing problems was given to apply what they had learnt.	
	Challenges	❖ Low levels of literacy amongst learners had learners struggling to understand the terminology in the activity. Educator showed the patience and understanding by slowly going through the activity. ❖ Very far behind in the syllabus	
	Recommendations and planning for next visit	The pace must be picked up and extra classes will have to be implemented if any catching up is to take place.	
	Reflection, stories, comments	I am very positive about the influence Jenny has on the children that she teaches but am very worried about the pace at which she teaches.	

Format (nature) of visit to teacher/s	**Name of teacher**	**Tara**	
	Grade 12 A &B	Expected no of learners 19	Actual no of learners 18
	Topic	Trigonometric identities	
	Contextualisation	Tara has one grade 12 class for mathematics with 19 Afrikaans learners in it. Classroom is very neat and tidy. Few posters on wall and the environment is comfortable and conducive to learning. She shares grade 12's with Jenny.	
	Planning	Working according to the pacesetter but is about two weeks behind.	
	Teaching methodology	The learners were given a worksheet to complete from an alternative text book. Tara was actively involved and facilitated constantly on an individual basis as well as with the whole group .	
	Implementing resources	Work sheet from alternative text book	
	What did they learn? Method/technique/ assessment tool	No formal assessment took place during the lesson but an exercise containing problems were given to apply what they learnt. Learner's books were marked/checked whilst doing the activity and exercises.	
	Challenges	❖ Unsuccessful learners, from a previous grade, that have been promoted to the mathematics class, under the instruction of the WCED curriculum advisors. ❖ Pace at which learners are capable of working is varied and overall slow ❖ Class does not bring text books to school ❖ Homework rarely gets done ❖ Upon enquiry Tara said that there are no discipline structures at the school that support teachers in the form of detention classes. She feels that her hands are tied as far as discipline regarding homework and text books are concerned.	
	Recommendations and planning for next visit	Tara has a good relationship with her class but must push them more to get them thinking and grappling with the concepts. The work ethic and homework issue must be worked on and sorted out with the support of the SMT.	
	Reflection, stories, comments	Tara has a positive influence on her learners and they regard her classroom as a clean safe place where they can work and focus	
	Teacher's professional development plan	The new grade 12 syllabus may prove to be a challenge and issues must be made known before it is too late.	

CLASSROOM REPORT

DATE	6 May 2008
VISIT	3rd visit
FACILITATOR	X

CONTEXTUALISATION FORMAT OF VISIT TO PRINCIPAL	This visit was meant to take place on the 9th of May, but the other school could not accommodate me and I was therefore very grateful to Dunbar High for receiving me at such short notice. The principal said that he had no applicants for a post level one Maths position and that he is struggling to keep teachers. The contract positions are receiving 37% extra to cover housing, medical aid and pension. Although this money should be kept for those purposes teachers are battling to make ends meet and thus the contract positions look more attractive because they receive the money immediately. The problem with employing contract teachers is that they can give very short notice which puts more pressure on the school when they resign or move. At Dunbar High there are two Mathematics teachers that take on the whole of the FET phase. The teachers that are currently teaching grade 8 and grade 9 do not want the challenge of the FET phase or the pressures associated with teaching grade 12. The principal said that it was time that the grade 8 and 9 teachers take responsibility for producing a quality product for the FET phase. Discipline in the school was handled by firstly giving a verbal warning, secondly a letter was sent to the parents and then thirdly an interview was had with the parents. The principal acknowledges that discipline and motivation are big challenges and continually need to be addressed.	
FORMAT (NATURE) OF VISIT TO TEACHER	**Name of teacher**	**Jenny**
	Contextualisation	The class is big enough with enough desks for everyone. Some graffiti in the class. There is a relaxed quiet atmosphere in the class in which learners are given the space to think.
	Grade:11 (English)	No. of learners present: 26 No. of learners absent: 3
	Topic	Completing the square.
	Planning	Worksheet exercises that had been developed for Spark training had been photocopied beforehand and distributed in the class.
	Teaching methodology	The problem was written on the board and then the learners were asked to complete the square. They worked in groups of two or singly and Jenny walked around facilitating where needed.
	Implementing resources	Worksheets developed for the spark training was used as well as a textbook.
	Assessment Method/technique/ tool	Jenny asked leading questions to guide the learners and what I liked was that she explored the sometimes incorrect route to see where it would lead. The learners would convince themselves of the correct reasoning. Homework was given and would be checked the next day.

	Challenges	The learners work at a very slow pace. The relaxed atmosphere does lend itself to reflective thought , but the pace must be picked up.
	Recommendations / planning for next visit	The learners must be given more responsibility by letting them know that they have to work harder and faster in order to finish the work with understanding.
	Reflection and discussions	I think that the expectations for this class are low because they work at such a slow pace. These expectations then exacerbate the situation further.
FORMAT (NATURE) OF VISIT TO TEACHER	**Name of teacher**	**Tara**
	Contextualisation	The class is clean and neat as a pin. The class is organised and the learners are well disciplined.
	Grade:10 (English)	No. of learners present: 22 No. of learners absent: 5
	Topic	Polygons and Properties of triangles
	Planning	The work for the lesson was already written down on the board with space left for the development of the concepts. This indicates that thought and planning had gone into the lesson.
	Teaching methodology	Learners had to assign certain properties to various triangles (isosceles, Equilateral and scalene) and then the concepts related to regular polygons were developed from the properties of the triangles. The prior knowledge was tested and found lacking. The learners did not know that the angles of a triangle add up to 180^{o}. Tara made sure that the prior knowledge necessary was understood before going on.
	Implementing resources	Text book and blackboard as well as own notes developed by Tara.
	Assessment Method/technique/ tool	The class were constantly questioned in order to check understanding. The level of the questions were varied and apt.
	Challenges	The class is far behind and they work very slowly. The prior knowledge that should be understood is lacking.
	Recommendations / planning for next visit	The pace must be picked up but not at the expense of understanding.
	Reflection and discussions	Tara is doing the right thing by testing prior knowledge and making sure that it understood. Although this slows down the pace at which the work is done one has to make sure that everyone grasps the prior knowledge.

CLASSROOM REPORT

DATE	23 May 2008
VISIT	4th visit
FACILITATOR	X

CONTEXTUALISATION FORMAT OF VISIT TO PRINCIPAL	The principal said that the pressure on his staff at this time of the year was huge and he looked forward to getting the exams underway to change the focus. Otherwise the school was functioning well.	
FORMAT (NATURE) OF VISIT TO TEACHER	**Name of teacher**	**Jenny**
	Contextualisation	The class was full with enough desks for all
	Grade:12	No. of learners present: 32
	Topic	Roots of equations
	Planning	Some planning was presented
	Teaching methodology	Jenny worked through the homework and the learners made their corrections. After that the learners had to work on another problem while Jenny facilitated as needed.
	Implementing resources	Textbooks and Spark material
	Assessment Method/technique/ tool	The learners books were checked while they worked on their own.
	Challenges	The pace at which these learners work is very slow and the basic concepts are still lacking. Jenny is trying to address the backlog and catch up which is an impossible task at this stage.
	Reflection and discussions	The pace remains slow, but a big positive is that the homework was taken seriously by the learners and it was done! When I left this classroom I inadvertently left my cell phone on the desk. When I returned almost an hour later Jenny handed the phone to me and said that some of the learners had handed it in after break. I was relieved to have my phone back but was more impressed at the level of integrity displayed by those learners. Honesty and integrity are part of the syllabus in Jenny's class!

FORMAT (NATURE) OF VISIT TO TEACHER	**Name of teacher**	**Tara**
	Contextualisation	There is plenty of room in this neat clean haven.
	Grade:12	No. of learners present: 14 No. of learners absent: 2
	Topic	Revision
	Planning	Tara had planned to have this revision session with the learners prior to a control test on the following Monday.
	Teaching methodology	The learners were working through a tutorial that they had written and were making corrections and clearing up misconceptions highlighted by the tutorial. The learners were given help when needed and certain common mistakes were highlighted and taught in detail.
	Implementing resources	Tutorial and textbook
	Assessment Method/technique/ tool	Tutorial questions were made available.
	Challenges	The pace at which the work can proceed is too slow. There are too many basic skills that these learners have not yet mastered for them to work any faster.
	Recommendations / planning for next visit	The next visit will take place in the 3rd term.
	Reflection and discussions	The learners were very willing to stay in during break to go on with the work. This shows eagerness and a willingness to work. The pressure of getting through the work before the exams is telling on the learners and the educators alike. A businesslike productive atmosphere exists in this classroom. I hope it persists through the next two terms.

CLASSROOM REPORT

DATE	11 March 2009
VISIT	3
FACILITATOR	Ramesh Jeram

CONTEXTUALISATION FORMAT OF VISIT TO PRINCIPAL	Arrived at school at 8:30 am. Greeted by principal who was busy dealing with behavioural issues. Went directly to HoD, Jenny. Late comers were standing outside for the duration of the first period. Principal deals with them afterwards.	
VISIT TO TEACHER	**Name of teacher**	**Jenny**
	Context	Learners were sitting outside along the corridors due to educators being absent. Despite this, school was functioning normally.
	Grade:11 C/D/E (E)	Present:31 Absent:4 Total:35
	Topic:	Number Patterns
	Planning	Behind with grade 10, 11 and 12 work schedules. Approximately two week delay.
	Teaching methodology	Educator introduced number patterns via exercise. Learners were allowed to sit and work through material on their own. Not much discussion was encouraged but learners seemed content to work on their own. Brief discussion took place whilst educator moved around checking work. Gave the rest of the exercise for homework. Excellent ideas to let learners first discover and recall prior knowledge before moving onto new concepts.
	Implementing resources	Used SPARK gr.11 workshop material.
	Learner portfolio assessment	By the end of the quarter, learners in grade 10, 11 and 12 would have completed an investigation, tutorial and formal test. Will check progress on next visit.
	Educator portfolio assessment	Will check on next visit
	Assessment during lesson	Worksheet given to complete.
	Reflection	Educator is an experienced one and she is always open to new ideas. She is respected by her learners. However, she struggles with the grade 10 learners due to their low literacy and numeracy levels. Learners lack basic comprehension skills and thus find it difficult to understand why they do the steps whilst solving the problem.
	Recommendations	Need to find ways to catch up with backlog of work, especially for grade 12.Attempts must be made to increase learner comprehension skills

VISIT TO TEACHER	**Name of teacher**	**Tara**
	Context	Learners were sitting outside along the corridors due to educators being absent. Despite this, school was functioning normally. Grade 12 learners were completing a questionnaire relating to a project run by UCT. Made inroads into the only double period available. Educator planned to use the double period to do an investigation. Disturbed that nobody informed her of this.
	Grade:11 A/B(A) Grade:12A (E)	Present:13 Absent:3 Total:16 Present:10 Absent:3 Total:13
	Topic: Gr.11 Gr.12	Number patterns Investigation: Inverse functions
	Planning	Behind with grade 11 and 12 work schedules. Approximately two week delay.
	Teaching methodology	Grade 11 Educator dealt with consolidation exercises on number patterns. Explored various ways to determine nth term of quadratic number patterns. Educator explained and learners did exercises. Small class thus learners are attentive and eager to work in their small groups. Discussions amongst learners are encouraged. Grade12 Learners were issued an investigative activity and were requested to do the activity on their own. Part of their formal CASS assessment. Already completed the theory. Educator facilitated the process. Suggested they use their books; styled along an open book examinations. Seemed more like a test!!
	Implementing resources	Used SPARK gr.11 and 12 workshop material.
	Learner portfolio assessment	By the end of the quarter, learners in grade 11 and 12 would have completed an investigation, tutorial and formal test. Will check progress on next visit.
	Educator portfolio assessment	Will check on next visit
	Assessment during lesson	Extra exercises given for grade 11.
	Reflection	Educator is an experienced one and she is always open to new ideas. She is respected by her learners. There seems a lot more confidence in her teaching.
	Recommendations	Need to find ways to catch up with backlog of work, especially for grade 12.

CLASSROOM REPORT

DATE	12 May 2009
VISIT	4
FACILITATOR	Ramesh Jeram

CONTEXTUALISATION FORMAT OF VISIT TO PRINCIPAL	Was greeted by HoD, Jenny. Held brief discussion and the following is noted: • Time table had to be redone due to re-allocation of classes to educators. • Concern about completing syllabus for grade 10 and 11 for common examinations. Will be having extra classes.	
VISIT TO TEACHER	**Name of teacher**	**Tara**
	Context	School functioning normally. Learners on time for class. Classes small, thus easier to monitor progress whilst doing exercises.
	Grade:11A/B (A) Grade: 12A (A)	Present:15 Absent:1 Total:16 Present:12 Absent:1 Total:13
	Topic	Grade 11: Basic Trigonometry Grade 12: Calculus
	Planning	Lesson plan available On track with grade 12 work schedule. Hoping to finish syllabus by end of term. Approximately two weeks behind with grade 11 syllabus.
	Teaching methodology	Both lessons observed started with marking homework exercises. New work was explained on the board with examples and exercise subsequently given. Style was mostly “talk-and-chalk” but questions were constantly asked to learners who responded well. Grade 11 learners were struggling with signs of trigonometric ratios in various quadrants. Taught grade 11 lesson to reinforce understanding of trigonometric ratios in various quadrants.
	Implementing resources	Used examples and exercises from textbook. Question papers with memoranda were copied and made into booklet form for grade 12 learners to use as revision guide.
	Learner portfolio assessment	Will check on next visit.
	Educator portfolio assessment	Will check on next visit
	Assessment during lesson	Informal checking of exercises by attending to each learner.

VISIT TO TEACHER	**Name of teacher**	**Jenny**
	Context	School functioning normally. Learners on time for class. Classes are large but good discipline. Takes extra time to offer individual attention whilst monitoring progress doing exercises.
	Grade:11C/D/E (E) Grade:12B (E)	Present:31 Absent:4 Total:35 Present:37 Absent:7 Total:44
	Topic	Grade 11: Coordinate Geometry Grade 12: Trigonometry: Compound angles
	Planning	Lesson plan available On track with grade 12 work schedule. Hoping to finish syllabus by end of term. Approximately two weeks behind with grade 11 syllabus.
	Teaching methodology	Both lessons observed started with marking homework exercises. New work was explained on the board with examples and exercise subsequently given. Style was mostly “talk-and-chalk” but questions were constantly asked to learners who responded well.
	Implementing resources	Used examples and exercises from textbook. Question papers with memoranda were copied and made into booklet form for grade 12 learners to use as revision guide.
	Learner portfolio assessment	Will check on next visit.
	Educator portfolio assessment	Will check on next visit
	Assessment during lesson	Informal checking of exercises done by learners.
	Reflection	Concerned about emotional state of educator. Excellent educator but does have bouts of depression from time to time. Feeling the pressure of completing syllabus on time for common examinations in grade 10 and 11. Educator has history of depression due to personal and emotional challenges experienced during last three years. Currently coping but needs support to help her overcome her emotional and personal challenges.

CLASSROOM REPORT

DATE	1 June 2009
VISIT	5
FACILITATOR	Ramesh Jeram

CONTEXTUALISATION FORMAT OF VISIT TO PRINCIPAL	Was met by HoD, Jenny. Due to examinations starting, no classroom observations were done. The purpose of this visit was to assist the educators in offering ideas on how to complete the terms work. Discussions were held with Jenny and Tara. The following is noted: GRADE 10: There is grave concern, from both educators, about completing the terms work for this grade. Learners are struggling to adapt to new teaching methods and assessment methods. The low levels of literacy and numeracy of the learners at this level, is making it harder to work at a faster pace. As the learners will be writing a common district examination, it is feared that the learners will not be prepared. Discussions ensued and suggestions offered on how to complete and prepare learners for the examinations. Worksheets were drawn up and approaches discussed on how to tackle the content in the best possible way. Extra time would have to be put in by the teachers so as to complete the work. GRADE 11: A similar situation exists in this grade but structures are already in place (such as classes after school) to cover the content and prepare learners for the examinations. At most they have one or two small concepts to work through but most of the time will be spent on doing past question papers; incorporating examination skills. GRADE 12: All the terms work has been completed for grade 12. Afternoon classes will be held to go through past question papers and develop examination skills. These educators feel disappointed and despondent about the situation in grade 10. This is the first time, since the inception of the project, that they are experiencing a backlog to such a vast extent. There have been backlogs in previous years but not to such an extent. These are hardworking and dedicated educators but I hope that this does not further damage their spirit and enthusiasm for teaching. They have made excellent strides on the project.

CLASSROOM REPORT

DATE	4 August 2009
VISIT	6
FACILITATOR	Ramesh Jeram

CONTEXTUALISATION FORMAT OF VISIT TO PRINCIPAL	Arrived at the school at 8:00. Staff had a debriefing session. Administration period after debriefing and the first period started at 9:10. Met with HoD, Jenny and the following is noted: • Completed grade 12 syllabus, currently busy with revision. • Issued each gr.12 mathematics learner with an Examination Aid Question and Answer book to assist with revision. • On track with grade 10 and 11 work schedule in WCED Programme of Assessment. • School functioning normally, albeit shortened periods due to staff debriefing held in the morning.	
VISIT TO TEACHER	**Name of teacher**	**Tara**
	Context	Classroom neat and tidy. Educator put posters on walls. Learners seated in groups to encourage discussion.
	Grade:11A/B (A) Grade:12A (A)	Present:14 Absent:2 Total:16 Present:11 Absent:2 Total:13
	Topic	Grade 11: Quadratic function Grade 12: Revision
	Planning	Lesson plan presented for grade 11.Need to compile revision plan for grade 12. Offered suggestions
	Teaching methodology	Grade 11: Educator gave learners consolidation activity on quadratic function. Moved around the class to check on learners work and dealt with any challenges. Grade 12: Started revision programme using Examination Aid book issued to learners. Briefly addressed learners on how to use the book efficiently. Assisted educator in classroom with answering learner's questions whilst doing problems from the book.
	Implementing resources	Using revision book for grade 12 and wrote problem on board for grade 11.
	Learner portfolio assessment	On track with WCED Programme of Assessment. Will check on next visit.
	Educator portfolio assessment	Will check on next visit.
	Assessment during lesson	Informal consolidation activity.
	Reflection	The levels of pace and efficiency at which these educators work is a testament to the excellent working relationship and experience they have. Their frustrations about completing the syllabus during term 2 have turned into optimism.

VISIT TO TEACHER	**Name of teacher**	**Jenny**
	Context	Classroom neat and tidy. Learners seated in desks in rows.
	Grade:12B (A)	Present: Absent: Total:44
	Topic	Grade 12: Revision
	Planning	Need to compile revision plan for grade 12. Offered suggestions.
	Teaching methodology	Started revision programme using Examination Aid book issued to learners. Briefly addressed learners on how to use the book efficiently. Assisted educator in classroom with answering learner's questions whilst doing problems from the book.
	Implementing resources	Using revision book for grade 12
	Learner portfolio assessment	On track with WCED Programme of Assessment. Will check on next visit.
	Educator portfolio assessment	Will check on next visit.
	Assessment during lesson	Informal consolidation activity.
	Reflection	The levels of pace and efficiency at which these educators work is a testament to the excellent working relationship and experience they have. Their frustrations about completing the syllabus during term 2 have turned into optimism.

CLASSROOM REPORT

DATE	25 August 2009
VISIT	7
FACILITATOR	Ramesh Jeram

CONTEXTUALISATION FORMAT OF VISIT TO PRINCIPAL	Arrived at the school at 8:00. Staff had a debriefing session. Administration period after debriefing and the first period started at 8:30. Met with HoD, Jenny and the following is noted: • Grade 12 currently busy with revision and control tests. Mock examinations start Friday 28 August 2009. • On track with grade 10 and 11 work schedule in WCED Programme of Assessment. • School functioning normally, albeit shortened periods due to staff debriefing held in the morning and control tests scheduled for today. • Focus of this visit is on checking progress of Grade 10, thus only visited Jenny.	
VISIT TO TEACHER	**Name of teacher**	**Jenny**
	Context	Classroom neat and tidy. Learners seated in desks in rows.
	Grade:10C (E) Grade:10D/F (E)	Present: 36 Absent: 8 Total: 44 Present: 17 Absent: 0 Total: 17
	Topic	Grade 10: Trigonometric Ratios, right angled triangles: 2D
	Planning	Lesson plan presented.
	Teaching methodology	Talk-chalk-lesson explaining the definitions of the various trigonometric ratios in a right angled triangle. Used various spatial representations of a right angled triangle to define each trigonometric ratio. Questioning and discussion were encouraged. Learners actively involved in lesson.
	Implementing resources	Using textbook and additional notes
	Learner portfolio assessment	On track with WCED Programme of Assessment.
	Educator portfolio assessment	Has been checked by curriculum advisor.
	Assessment during lesson	Informal consolidation activity.
	Reflection	Making much greater progress with syllabus as in 2008. Confidence levels in teaching problematic areas has increased and more organised administratively.