An exploration of the use of coaching and mentoring as a professional development process for primary school emerging leaders: Using science as a context

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ABSTRACT

This study looks at the impact of coaching and mentoring skills, provided through a professional development programme, on developing emerging middle leadership in primary school teachers, where the focus is on science teaching. Emerging leaders play a very important role in supporting and developing other teachers' pedagogy in the implementation of the curriculum and new initiatives into the classroom. The literature illustrates that the skills for coaching and mentoring form a key part of a leader's role, in particular that of an emerging leader where teachers are coaching teachers. These skills can assist in the formation of professional learning communities with a strong focus on the teachers' practice and the enhancement of student learning outcomes.

The study involves four teachers (emerging leaders) from four large primary schools. It uses a qualitative approach, with an action research methodology. The tools used for data gathering are a questionnaire, semi-structured interviews, focus group interviews and written journal reflections at the workshops. The data is thematically analysed.

The findings emphasize the value of coaching and mentoring skills in the professional learning of emerging leaders and the teachers that they are working with. Two overarching changes in the emerging leaders' practice arose. Firstly changes in the leadership understandings of the emerging leaders and secondly in the growth of their leadership practice as they developed small professional learning communities. The importance of trust and relationships as part of the community was highlighted. The data also identified a change in the depth and the development of talk about the teachers' science pedagogy. A crucial realization for the participants was the difference between professional and social conversations when it came to taking a leadership role.

The implications of this research include the importance of providing emerging middle leaders in primary schools with the opportunities to explore the bigger picture of leadership. Senior school leaders would be

advised to provide professional development opportunities to help emerging leaders develop in their understanding and practice of the skills and knowledge base involved in the leadership process. This study has illustrated that a coaching and mentoring approach to fostering professional learning can be effective in the growth of leadership skills.

ACKNOWLEDGEMENTS

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Chapter One: Introduction

1.1 Rationale

There is a growing body of knowledge and evidence that points towards the importance of building leadership capacity within a school. Often the key change agents within a school are the senior classroom teachers who support and provide professional learning experiences to other classroom teachers. These teachers are vital to building pedagogy and new curriculum initiative knowledge. They are referred to in this study as emerging leaders. However, the role and professional practice of teachers in this capacity is not clearly identified in the literature nor fully recognized by the teachers themselves. This study proposes to clarify how the capacity and key skills required for leadership can be built by the participants within a coaching and mentoring process. This leadership capacity building involves developing a basic understanding of leadership and the role of an emerging leader (often seen as a curriculum leader). The emerging leadership role in this study is developed through a professional development programme provided by the researcher and by each emerging leader setting up a small professional learning community within their own school.

This chapter sets out the research aim and provides an overview of the purpose and the background to the six main contributing themes (*leadership, emerging leaders, curriculum leadership*, *coaching and mentoring, professional development, professional learning communities).* It also includes the personal background of the researcher and reference to the overall structure of the report.

1.2 The research aim

The research aim is to:
Explore the use of coaching and mentoring as a professional development process for primary school emerging leaders, within a science context.
This is a research study that examines the provision of professional development in the form of coaching and mentoring as a process to assist in the development of leadership skills in four teachers who are middle emerging leaders or new leaders in four separate primary schools. In order to practice leadership skills, in particular

coaching and mentoring, there needs to be a specific context and focus as it is essential that leaders can see the direct relevance of their professional development to their practice (Robertson, 2005). The development of the leadership skills is set within small learning communities, consisting of teaching colleagues at the emerging leaders' schools. The context used is science as there is currently a paucity of primary science curriculum leaders. The focus on the Ministry of Education initiatives in numeracy and literacy has had a detrimental effect on the time and rigor given to science teaching and learning in the primary sector (Education Review Office, 2004). This study will go some way towards redressing this by providing support for emerging leadership in a science context.

1.3   Background

This background section explores the key themes that are considered by the researcher and supported by literature to contribute to the development and understanding of the emerging leader's role. These provide a frame for this study.

1.3.1 Leadership

Leadership for emerging leaders is frequently left for the leaders themselves to pick up in an ad hoc way, with models of leadership in action being few and mainly only that of their principal. The actual practice of the leader and the theory of their leadership are not made overt or fully recognized by the emerging leader. The theories and styles of leadership that provide a collaborative and encouraging climate that support change and innovation are essential to the growth of emerging leaders. Sustainability of change and school improvement depends on the school's internal capacity to maintain and support the developmental work happening and therefore many people need to be involved (Fullan, 2001). This relates to the importance of the middle or emerging leader's role in schools. Timperley (2006) also confirms that there is a growing body of evidence that points towards the importance of capacity building in schools as a means of sustaining improvement. She says that "leaders do not lead alone but have reciprocal relationships with followers who are also at times leaders" (Timperley, 2006, p.547). For this to happen leadership skills need to be developed in teachers. Spillane (2000) adds that distributed leadership is a form of leadership which involves all but especially middle or emerging leaders and is a type of collective agency incorporating the activities of many individuals in a school who work

together at mobilizing and guiding other teachers in the process of instructional change. Engaging many people in leadership activity therefore is at the core of distributed leadership in action. It also means harnessing the leadership potential within the organization rather than relying on the leadership capability of individual leaders (Harris, 2005). The key learning from a recent New Zealand funded research synthesis on leadership also points out the importance of having leadership involved in the core business of teaching and learning, as this is shown to have more impact on valued student outcomes. "School leaders who build relationships with staff through a collaborative and tight focus on teacher and student learning can make a powerful difference to their students" (Robinson, 2007, p.12).

1.3.2 *Emerging leadership*

Emerging Leadership is seen as the first stage of leadership when a teacher is willing to take on leadership responsibilities (NCSL, 2001). In this study 'emerging leaders' is a term referring to teachers who are classroom practitioners and who may already have some responsibilities such as a tutor teacher (responsible for giving professional support to beginning first or second year teachers), or have led a particular project within the school, for example, numeracy project lead teacher. The culture of the school and the role of the leadership style in encouraging the development of emerging leaders within the school organization are crucial. The current need for a greater emphasis on student achievement, student focused learning and evidenced based learning has made it more and more evident that the challenges faced by schools and principals cannot be left as the leadership responsibility of one person (Barnett and Aagaard, 2007). Hadfield (2005) talks about the growing number of new middle leadership roles in schools both in the U.K. and internationally. This greater emphasis on evidence based learning along with the increased opportunities offered for teachers to pick up this role is a reflection on the changing nature of leadership. School principals are also promoting more delegation from their own roles as they see networking as peripheral to the focus of school work. Hadfield also refers to the changing nature of external interventions that require further leaders to be identified.

1.3.3 The curriculum leader

The curriculum leader who is considered to be a middle or emerging leader in this research study may have varied roles. In a secondary school this role may be that of a head of department or faculty whereas in primary schools, depending on the size of the school, a teacher may be identified as a leader of a particular learning area. This is found commonly for numeracy and literacy but the identification of a science curriculum (learning area) leader is less common. The teacher may be given the role of looking after the science resources or science budget. A curriculum (learning area) leader is expected to assist others with the planning for the teaching and learning and have a detailed knowledge base. Curriculum leadership or subject leadership plays a key role in the professional development and learning of other teachers. These curriculum leaders (emerging leaders) are often the most accessible and immediate source of professional development for teachers within a curriculum area (Blewett and Cowie, 2007). This is particularly true at the moment in New Zealand as currently a revised curriculum is being introduced to be finally in place by 2010. Fletcher and Bell (1999) identify from interviews that they carried out with subject leaders in primary schools across different curriculum areas in Britain, several tasks that curriculum leaders carry out including staff professional development, subject knowledge expertise and supporting staff. The time given to feed-back and discussion over common issues in the teaching of science has been highlighted through evaluations of curriculum implementation contracts (Barnett, 1995) as the most useful sessions of the science professional development programmes. The skills learnt through coaching and mentoring can promote and encourage professional discussions.

1.3.4 The terms coaching and mentoring

Coaching and Mentoring terms are often used interchangeably and it is difficult to find a single definitive meaning of the terms in the literature. An issue that frequently occurs in carrying out this process of coaching and mentoring is a lack of clear understanding in the use and meaning of these two terms. Hobson (2003, p. ii) points out that "mentoring is more generally used to refer to a process whereby a more experienced individual seeks to assist some one less experienced and the term coaching is used to refer to forms of assistance relating more specifically to an

individual's job-specific tasks skills or capabilities". Hopkins -Thompson (2000) describes mentoring as an intense relationship in which the senior person oversees the career development and psychological development of a less experienced person. Regardless of how the words are defined, the overriding requirement is to enhance the professional practice of a teacher, by having a manageable change support system in place to ensure effective growth for the teachers' present and future learning. Ackerman (2002) states how mentoring has been seen as an important aspect of professional development in several countries including Australia, United Kingdom and the United States. Bell (1996) describes a model for professional learning as having three key aspects, social, professional and personal. Coaching and mentoring also require these aspects to be addressed. In addition implicit in the process of mentoring are the critical levels of thinking and learning, the change process and an understanding of adult learning. A powerful agent of change and professional development in learning therefore is the coaching and mentoring process (Robertson, 2005). In this research, the researcher is acting as the mentor to the emerging leaders. Each emerging leader then works as a coach in a small learning community set up by themselves in their own school.

1.3.5 Professional development

In the literature and in everyday usage by educators there is an interchangeable use of the terms professional learning and professional development. It is therefore useful to have these terms further clarified as to their meaning in this research report. Timperley (2006) defines professional development as having connotations of delivering some kind of information to teachers in order to influence practice, whereas professional learning implies a more internal process through which individual teachers create and develop professional knowledge. In this study professional development is better described as professional learning. In this study the term professional development is used in the sense described by Guskey (2000), that is, those processes and activities used to enhance understanding. In this study therefore the understanding is of the process and activities of coaching and mentoring by the emerging leaders which in turn supports professional learning not only by the emerging leaders but also by the researcher. Pigot-Irvine (2006, p.481) produces a summary list of the features that contribute to an effective professional

development programme. She highlights that there are multiple and intersecting dimensions and that these include the incorporation of the principles of adult learning, programme components themselves and expert facilitation. Timperley, Wilson, Barrar and Fung (2007) and Hewson (2007) all talk about the complexity of showing the direct effect that professional development has on student outcomes. The scope of this study does not include looking at student outcomes.

1.3.6 Professional learning communities.

Professional learning communities have become very common practice within schools and school communities. Mitchell and Sackney (2000) in Stoll, Fink and Earl (2003) define a learning community as "a group of people who take an active, reflective, collaborative, learning-orientated approach to the mysteries, problems and perplexities of teaching and learning" (p. 132). An effective professional learning community has the capacity to promote and sustain the learning of all professionals in the school community with the collective purpose of enhancing pupil learning. Stoll (2005) identifies seven key components to a professional learning community, which are discussed further in this report. Professional learning communities can develop as a result of effective professional development and coaching if, as Southworth (2002) discusses, most of the professional learning is seen as highly relevant and focused on enhancing teachers' classroom knowledge, understanding and skills, in order to facilitate their students' learning. Timperley et al. (2007) point out that the teacher talk and the outcomes of a learning community are unsuccessful unless there is a clear focus to improve student outcomes and to develop new understandings. For the four emerging leaders involved in this study to be successful in developing their learning communities, the context needs to be clear (in this case science teaching and learning). The over-riding purpose as confirmed above is to develop clear understandings by the teachers of both the process and the context through a common focus on enhancing student learning outcomes. These points are imperative to this study.

1.4   Personal background

I have been fortunate to hold the position of Director of School Support Services (provider of professional learning to schools) for twelve years, along with seven additional years as an adviser to schools in science. I am currently also involved as a national member of the Strategic Reference Group for INSTEP (In-Service Teacher Educator Practitioner) research and development project Ministry of Education 2007, which looks at the effective practice of in-service teacher educators. As a past teacher and current provider/facilitator of professional development and learning to primary and secondary teachers in the greater Waikato Region, including science curriculum development and classroom practice, I have a passion to ensure that quality leadership of learning occurs. In particular, support for science curriculum leadership that takes place in primary schools, interests me. This study will go some small way towards providing opportunities for teachers to explore leadership in a science learning context.

Research shows that in order to effectively carry out coaching and mentoring, the process has to be embedded in a highly relevant context (Robertson, 2005). In this case, science curriculum leadership within the school has been chosen. I have completed Masters papers in educational leadership including a paper in coaching and mentoring. This paper clarified and enabled the process of coaching and mentoring to be firmly embedded in my own leadership role and in the process of reflective enquiry that I use when working with staff and teachers. This personal background led to the development of my research question;

How effective is coaching and mentoring as a process in developing leadership skills for emerging primary school leaders in a science context?

1.5   The research study

In this research, I explore the effects of a coaching and mentoring professional development programme on the understanding and practice of leadership in four emerging leaders. As part of the professional development programme, the emerging leaders are encouraged to practice the skills and ideas learned. This is done within a small learning community that is set up by the emerging leaders themselves in their own school. Each learning community took science as a key context. I, as the

researcher, provided five professional development workshops on coaching and mentoring skills and the emerging leaders practised and developed these skills with their colleagues.

In chapter two of this study the key literature on the main contributing themes is explored. An argument is built to support coaching and mentoring as an effective professional development process for leadership growth.

In chapter three the methodology used is explained and confirmed as a qualitative approach, with an action research methodology. This methodology enables research findings to have an on-going impact on the learning by the emerging leaders and the researcher (myself) as the intervention in the form of successive professional development workshops takes place. The tools used for data gathering are a questionnaire, semi-structured interviews and focus group interviews. The focus group interviews took place during three of the reflection sessions held at the workshops. The participants kept their own personal journals of their experiences during their learning community meetings. They used these to inform their reflections at the workshops. The data is triangulated and thematically analysed using trustworthiness criteria (Lincoln and Guba, 1994).

In chapter four the rich qualitative data is analysed, collated into themes and then placed under two significant domains (over arching themes) to assist in extracting the main findings.

Chapter five answers the research question and discusses the key findings, linking these to the literature reviewed. The significance and support for these findings along with the limitations of this research and recommendations for future research are explored.

Chapter Two: Literature review

The main themes used in this literature review are those that emerged from the literature readings and the researcher's personal experience from years of practice as an in-service teacher educator working with many primary lead teachers over ten years. The main themes are those of leadership, coaching and mentoring, professional development and professional learning communities. Leadership includes emerging leadership and curriculum leadership. Coaching and mentoring includes the process of coaching and mentoring, change as a process, the role of the mentor and coach, attributes of the mentor and coach and issues in mentoring. Professional development explores the changing face of professional development and lastly professional learning communities are addressed. All these themes merge for the participants when they embed the skills and ideas in leadership development.

2.1   Leadership

In order to have an understanding of an emerging leader's role and place within a school the overarching concept of leadership needs to be explored. There are a multitude of different theories of leadership. One of the more prominent theories on leadership, and one that is currently referred to by principals in New Zealand schools, is transformational leadership. Leithwood(1994) refers to the four aspects of transformational leadership as individual consideration (attending to individual staff needs), intellectual stimulation (thinking of new ways to solve old problems), inspirational motivation (communicate high expectations of staff and students), and idealized influence (personal accomplishments and modelling by the leader of behaviour for the teachers in their school).Transformational leadership relies on the ability of a leader to inspire and motivate others on the basis of shared core values. A good way to visualize such leadership is to recall Martin Luther King Junior's "If I had a dream" speech (Reagan, Case and Brubacher, 2000). Another leadership theory used by school leaders is servant leadership. This promotes the belief that effective leadership emerges from a desire to help others and contrasts with transformational leadership, where there is a much stronger emphasis on overseeing those within the organization. The servant leader is positioned at the centre of the organization and the critical skills required are an understanding of the personal

needs of all those within the organization, such as healing conflict, developing the skills of those within the organization and being an effective listener. The culture aimed for is one of nurturing and developing relationships with all staff rather than working with a few high level managers, (Marzano, Waters and McNulty, 2005). The leadership theory referred to by Timperley (2006, p. 547) that would appear to support the growth of emerging leaders is shared leadership or distributed leadership. This embraces the idea that "leaders do not lead alone but have reciprocal relationships with followers who are also at times leaders". Timperley, (2006) cites Southworth (2002) as presenting what leaders in improving primary schools need to do to build capacity through the identification of several interrelated ideas. The three interrelated key ideas are firstly the use and interpretation of evidence which engages leadership, secondly a focus on sharing and developing leadership at all levels, and thirdly improvement through professional learning focused on improving student learning outcomes. This distributed leadership along with social cohesion and trust, it has been argued, is at the core of the capacity building model (Harris, 2004). There is a growing body of evidence that points towards the importance of leadership capacity building in schools as a means of sustaining improvement. The role of the middle leader is seen as vital in playing a part in building this leadership capacity and in growing sustainability. The emerging leader often takes on the role of a middle leader within the school and this role is clearly seen as part of a school that is participating in the distributed leadership model. Spillane (2001) supports this and states that distributed leadership is a form of collective agency, incorporating the activities of many individuals in a school, who work at mobilizing and guiding other teachers in the process of instructional change. This instructional change has at the heart of it curriculum change, which is frequently carried out by emerging leaders such as lead teachers for numeracy, literacy and in this research, those involved in science curriculum leadership. Bennett in Harris (2004) suggests that it is best to think of distributed leadership as a way of thinking about leadership rather than as another technique or practice. It re-conceptualizes leadership in terms of leadership of the many rather than the few (Harris, 2004). Distributed leadership concentrates on engaging expertise wherever it exists within the organization rather than seeking this only through a formal role.

Distributive leadership is currently seen as an effective form of leadership in New Zealand and is part of the Kiwi Leadership project (Ministry of Education, Wellington, 2008). This project is used to describe an approach to school principal-ship that is unique to New Zealand as it incorporates Māori values. The project describes principals as educational leaders who create the vision and conditions in which effective learning and teaching take place. Principals do not do this alone. They use their leadership and management skills to work alongside staff, enabling them to build and sustain schools that are learning communities. These links can be seen in figure 1 below.

Figure 1: The Kiwi Leadership Model

(Ref http://www.leadspace.govt.nz)   Ako – Pono – Awhinatanga -Maanakitanga[1]

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[1] Ako: Effective teaching and learning for Maori students, Pono: Truth, honesty, Awhinatanga: assistance, support, Maanakitanga: is a feeling it implies responsibility for hospitality, care.

The above figure 1 shows the linking together of the factors that influence the leading of learning within a school, that is the learning environment or context. In the central position of the diagram can be the principal or a classroom teacher or in this case the emerging leader.

To sum up, leadership therefore involves a mixture of perspectives and theories set in a local context. It seems that of all of these theories and styles of leadership, the distributed leadership way of thinking and operating within a school has the potential to provide a supportive environment for the identification and development of the emerging leader.

2.1.1 Emerging Leadership

Emerging leadership is seen as the first stage of leadership, when a teacher is willing to take on leadership responsibilities. This in turn enables them to be considered as emerging leaders. This emerging leadership may or may not be formalised, that is, it may or may not be given a specific title, status or monetary recognition, within the school organisation.

For emerging leaders to have the opportunity and support to develop and grow it is imperative that the environment, culture and vision of the school supports and nurtures these highly professional and vital teachers within their schools, offering them opportunities to use initiative, leadership and innovation within the school's organization. The current need for greater emphasis on student achievement, student focused learning and evidenced based learning has made it more evident that the challenges faced by schools and principals cannot be left to the leadership of one person (Barnett and Aagaard, 2007). This then calls for a change in the approach to leadership style, strategy and capacity building within the school.

In examining the differences between high and low performing schools, Robinson (2008) in the New Zealand Best Evidence Synthesis on School Leadership, pinpoints the five leadership dimensions that really have an impact on student achievement and outcomes, as seen in high performing schools. These leadership dimensions include establishing clear learning goals and expectations which are embedded in the practice of the school. Strategic resourcing which examines using data to identify resourcing needs. Planning, coordinating and evaluating teaching using the curriculum to make a strong impact on student outcomes. Another dimension is that

of promoting and participating in teacher learning and development, with the last dimension being that of ensuring an orderly and supportive environment. Robinson says that the key learning from the Synthesis is that

> the closer the leadership gets to the core business of teaching and learning, the more impact leaders have on valued student outcomes. School leaders who build relationships with staff through a collaborative and tight focus on teacher and student learning can make a powerful difference to their students. (Robinson, 2007, p. 12)

These dimensions are a key part of the role that an emerging leader plays in a school.

In fact many emerging leaders do not see themselves as leaders and do not attach importance to this fact which is a critical part of effective leadership. Robertson and Strachan (2001) support this in their findings, saying that teachers very often do not recognize their own part in leadership and their role as a leader. They found that teachers often refer to leadership as a role that principals and senior managers carry out, rather than seeing leadership as an action all are involved in.

In most cases emerging leaders in New Zealand primary schools (years 1-6/8) are classroom practitioners who take on an additional role of responsibility to coordinate a small group of teachers. Their role often has a specific purpose, such as a lead teacher for a curriculum programme in the school or a tutor teacher role with a responsibility to look after new teachers. This role may be referred to as a middle leader role although in New Zealand this is more common in secondary schools (years 9-13). In research carried out by Hadfield (2005) he talks about the growing number of new middle leadership roles in schools both in the U.K. and internationally. He says that the increased opportunities for teachers to pick up this role are seen as a reflection of the changing nature of leadership in that principals are promoting more delegation as they see networking within departments, between teachers as peripheral to the focus of school work; he refers to the changing nature of external interventions that require further leaders to be identified. This is also true in New Zealand where Ministry of Education initiatives such as numeracy and literacy require the identification of literacy and numeracy project leaders (coaches) or key lead

teachers within the school. In addition, the emphasis on the use of evidence and data to identify student learning needs requires a greater coordinated approach to planning the curriculum delivery within the schools. This requires teacher leadership capacity to be increased. To enable the focus on evidence based learning to be met many school principals are following a distributive leadership approach. This increases the number of opportunities for the emerging leader role (Barnett, 2007). Preparation for the emerging leader's role is pivotal.

In looking at the characteristics of emerging leadership, Lambert (2003) promotes the use of a rubric of emerging teacher leadership to identify different stages in a continuum from the initial dependent stage, independent stage, and interdependent stage through to the leadership stage. She explores each stage through four different aspects. She identifies these aspects as adult development, dialogue, collaboration, and organizational change.

To enable progress to be made along the continuum she promotes the use of skills and processes such as dialogue, self reflection, peer coaching and collaboration, that also form a core part of coaching and mentoring. Lambert (2003) gives evidence of this in the following quote on emerging leadership.

> The leader develops and supports a culture of self reflection that may include collaborative planning, peer coaching, action research and reflective writing, facilitates effective dialogue among members of the school community, facilitates communication among colleagues by asking provocative questions that lead to productive dialogue, promotes collaborative decision making, engages colleagues in activities that develop mutual trust (Lambert, 2003, p. 98).

Lambert shows that coaching and mentoring skills and processes which include the development of trust, active listening, reflection, reflective interviewing, self ownership of new ideas, evaluative feedback and the setting of professional goals do form a crucial part of the tools required for the role of an emerging leader. Robertson (2005) also confirms this with regard to coaching skills. She states that "for new leadership learning to take place leaders must cross the boundaries of their comfort zones this is an experience that can be constructed through the process of coaching"

(Robertson, 2005, p. 49). It can therefore be confirmed that for an emerging leadership role skills can be developed through the use of the coaching and mentoring process.

2.1.2 Curriculum leadership

One of the key roles that an emerging leader is likely to take on is that of leadership of a curriculum initiative such as those currently seen in many New Zealand schools in the learning areas of numeracy and literacy. Curriculum leadership or subject leadership plays a key role in the professional development and learning of other teachers. Curriculum leaders (emerging leaders) are often the most accessible and immediate source of professional development for teachers within a curriculum area (Blewett and Cowie, 2007). This is particularly true at the moment in New Zealand, as currently a revised curriculum is being introduced to be finally in place by 2010, with a strong focus on five key competencies (thinking, using language, symbols and text, managing self, relating to others, participating and contributing), values and principles as well as the eight essential learning areas. This change calls for strong leadership in guiding the development of classroom programmes. As Fullan (2002) points out, leadership becomes more crucial at times of change and must be cultivated deliberately at all levels of the organization. Curriculum leadership within a department also involves tasks such as communicating between senior management and the staff in the department (Busher and Harris, 1999). The time and resourcing support teachers need in times of change often have financial and organizational implications that can only be addressed through the support of senior management. Blewett and Cowie cite Edwards (2002) who sums up the diversity of leadership roles within a department into four tasks: managing the business, working with people, guiding the curriculum, and leading towards the future. The focus of leadership in curriculum is complex, with the leader being able to help the teachers identify the essence of the specific curriculum learning and knowledge and specific thinking (the big ideas) as opposed to other curriculum areas of learning. Fletcher and Bell (1999) identify, from interviews that they carried out with 20 subject leaders in primary schools across different curriculum areas, that the subject leader's task included the following categories; resources, paperwork, influencing practice monitoring, staff professional development, subject knowledge, supporting staff. When Fletcher and

Bell asked how the subject leaders actually saw their roles, the leaders themselves believed that what is most effective is supporting staff, subject knowledge, influencing practice and "other", which consisted of communication, approachability, ability to organise, prioritise and achieve goals. The emphasis on supporting colleagues and keeping subject knowledge up to date can easily be understood given the importance placed on relationships and the current pressure to keep abreast of subject change and development (Fletcher and Bell,1999). This is confirmed by Bell (2005) who sees teacher professional development in science as having two key elements, one is the input of new theoretical ideas and new teaching suggestions, the second is trying out and evaluating these ideas over an extended period of time in a collaborative situation, where the teachers are able to receive support and feedback, critically reflect and negotiate and reconstruct what it means to be a teacher of science. Certainly over the period of time that I have been involved in teacher professional development programmes (fifteen years), the time given to feedback and discussion over common issues in the teaching of science has been highlighted through evaluations as the most useful sessions of the professional development programme (Barnett,1995). This certainly confirms the importance of the place of coaching and mentoring skills in both the professional development process itself and as part of the emerging leadership role.

2.2   Coaching and Mentoring

The constant change taking place in the field of education provides an ongoing challenge to educators as to how they can keep improving and building on their practice and keep themselves informed of current changes to policy, curriculum and new Ministry of Education initiatives.

To enhance the professional practice of a teacher, a manageable change support system is required to ensure that effective professional growth for a teacher's learning and future learning is taking place. Mentoring (and coaching) is seen as a powerful agent of change, involving the setting up of mentoring systems to initiate, explore and extend successful professional dialogue in support of the current learning demands made on teachers and principals in schools. It is helpful therefore to explore the role of the mentor and coach and to define and align these roles along

with the task of enhancing professional learning. Ackerman, Ventimiglia and Juchniewicz (2002) state how mentoring has been seen as an important aspect of professional development in several countries including Australia, United Kingdom and the United States. Mentoring and coaching, the mentoring process, the role of the mentor, the attributes of mentoring and issues in mentoring will be examined by exploring and critically reflecting on a selection of texts and papers in the following paragraphs.

The terms mentoring and coaching are often used interchangeably and it is difficult to find a single definitive meaning of the term mentoring in the literature. Exploring some of the literature provides interesting insight into the two processes. Hopkins-Thompson (2000) describes mentoring as an intense relationship in which the senior person oversees the career development and psychosocial development of a less experienced person. She refers to coaching as a form of mentoring but argues that coaching is more focused and usually shorter in duration than mentoring, coaching relies on job related tasks or skills and is accomplished through instruction, demonstration and high impact feedback, this is especially recognized when looking at the role of sport coaches. Coaching is seen by Hopkins-Thompson (2000) in this case, as a sub set of mentoring. Hobson (2003) also has a similar view in his literature review on mentoring and coaching for new leaders, he states that "mentoring is more generally used to refer to a process whereby a more experienced individual seeks to assist someone less experienced and coaching is used to refer to forms of assistance relating more specifically to an individual's job-specific tasks, skills or capabilities, such as feedback on performance." Clutterbuck, in Hobson (2003), concurs with the broad conceptualization of mentoring and the narrower conceptualization of coaching referring to coaching as one of the 'core skills of mentoring' but acknowledges that coaching and mentoring slide into each other when discussion and dialogue move into wider, more personal issues. Clutterbuck's view of the term coaching is that used in this research.

Interestingly the concept of mentoring has been with us as for as long as people have been working together. The term mentor originated with an individual named Mentor who was a faithful friend of Odysseus. When Odysseus went off to fight the

Trojan Wars, he entrusted his son, Telemachus, into Mentor's care. Mentor was a tutor, guide, and protector to the boy over a number of years. The mentor role then was therefore considered to be a combined councillor, teacher, and guardian with the mentee in an apprenticeship role.

Hobson also emphasizes that the mentoring relationship is (or should be) a dynamic one, which changes over time as the relationship matures and as the mentee's experience and expertise develops. Goddard (1998, p. 3) states that "mentoring often includes the activity of coaching but can be much more than that, a mentor is a trusted, experienced professional who is willing to assist a less experienced person by listening, sharing experiences, advising guiding and coaching". He also cites Daloz who states that

> Mentoring is a relationship involving care and mutual respect in which one person helps another to learn and grow. A mentor is one who guides; a protégé is one who is guided. Mentors lead their protégés in a transformational journey manifesting the accomplishment of goals to which the protégé aspires; mentors offer encouragement and concrete help along the way. (Hobson, 2003)

This takes the view that mentoring is one way, with the mentor contributing all the learning that is occurring. Moir and Bloom (2003) in their article on "Fostering leadership through mentoring" refer to coaching as part of a set of skills needed by a mentor but do not go on to clarify the coaching role. Popper and Lipsitz (1992) look at coaching as having two components: (1) improving of performance at the skill level, and (2) establishing relations allowing a coach to enhance his/her trainee's psychological development. They do not make any mention of learning discussions or benefits to the coach. Robertson (2005) refers to

> coaching as a special sometimes reciprocal, relationship between (at least) two people who work together to set professional goals and to achieve them, the term depicts a special type of learning relationship, a relationship where participants are open to new learning and where there is a commitment to another professional's leadership development and well being, both cognitive and affective. (Robertson, 2005)

In this particular use of the word coaching there is mutual learning taking place with no clear top down role for the coach.

In summary, on exploring the different views put forward in the literature on coaching and mentoring as a process, there is a continuum of views from coaching as a sub-set of mentoring, as being a very tightly focused process applied to a defined set of job related skills only, with the expert providing top down training to the protégé to the much wider view of coaching as stated by Robertson (2005). Mentoring is most commonly viewed to be more complex than coaching, involving transformational and psychosocial aspects as well as skills. The mentoring relationship ranges from a top down mentor, who is the only knowledge source, to an equal learning partnership between mentor and mentee.

In my view for this study, the role of mentor is the most appropriate role for me to take. I bring to the professional development programme the experience and research knowledge of the coaching and mentoring process, with experience as a leader, and from knowledge and practice gained by taking a Masters paper in this topic. However, this does not imply a one-way learning opportunity. Each emerging leader brings their own experiences and knowledge and, through reflection dialogue, together we grow our learning about pedagogy leadership and coaching and mentoring. Each emerging leader then works as a coach in a small learning community set up by themselves in their own school.

2.2.1 Mentoring and coaching process
Implicit in the process of mentoring are the critical levels of thinking and learning, the change process and an understanding of adult learning. West-Burnham (2005) explores thinking and learning as going from shallow (what) to deep (how) to profound (why), with the 'shallow' learning involving a single loop of learning relating to mainly memorization of knowledge, for example, T.V. quiz shows, 'deep' learning involving a double loop of learning and reflection on knowledge for example coaching and mentoring, and 'profound' learning using a triple loop of learning involving intuition, wisdom and developing an unconscious competence e.g. an artist.

An understanding of the process of learning is an essential tool for the mentor.

2.2.2 Change

During coaching and mentoring the process of change is also taking place. Bell and Baker, (1997, p. 260) describe the nature of the change process from the teachers' perspective as:

- seeing my teaching and the classroom as problematic
- having a desire and commitment to develop professionally and to volunteer
- having an on-going view of professional development
- having ownership of the development
- viewing change as a challenge, not a problem
- feeling confident to make the changes
- having the time and energy for change
- dealing with student change and the student's responses to teacher change
- being prepared to take a risk.

The above is an example of the many processes that need to occur in the thinking of teachers during their professional learning and development programmes, to enable change to happen. Fullan (2001) looks at change as being a complex process and lists 5 components essential to understanding the change process especially within schools. His five components are: the goal is not to innovate the most, it is not enough to have the best ideas, appreciate the implementation dip, redefine resistance, re-culturing is the name of the game and stresses never a checklist but always appreciate complexity. Fullan emphasises the importance of developing the capacity and commitment to solve complex problems of change over time. This enables the change to be embedded, rather than trying to take on too many new innovations at once. In the above components Fullan highlights that the best idea, if held by the principal alone, will not happen. He refers to the "appreciation of the implementation dip" explaining that an understanding and expectation is needed of the fact that most change processes have a time when confidence and performance drops (dips), this also needs to be understood as part of any professional learning and development programme. He also highlights that respect and cognisance of different contrasting viewpoints enable change to occur. Without this the status quo will remain. He writes "re-culturing is the name of the game" (Fullan, 2001) and emphasises the importance of change in culture not just structures. Fullan

summarizes that change is always complex and cannot be organized into a linear step-by-step process or check list. Knowledge of the change process can also alleviate some of the resistance to change and remove barriers perceived by the mentees. This understanding of change needs to be combined with an understanding of adult learning. Herll and O'Drobinak (2004, p. 2) emphasize that being a good teacher is not enough when working alongside fellow teachers but equally important is to realise that 'adult learners possess a distinct set of characteristics' and that 'adult learning is enhanced by behaviours that demonstrate respect, trust and concern for the learner, adults want to be the originators of their own learning' along with appreciating genuine openness and mindfulness by the mentor. Mentoring is therefore a complex process involving personal, professional and relevant knowledge bases combined with an understanding of adult learning, the change process and the nature of learning and thinking. Hopkins-Thompson (2000) says that,

> Mentoring and coaching processes can serve to augment the succession planning and professional development of districts, they can model the culture of collaboration and collegiality in which best thinking occurs (p.29)

The knowledge of the mentoring and coaching process is a key tool in the process of professional development and learning for emerging leaders.

2.2.3 Role of the mentor and coach

In exploring the nature of the role of the mentor, Goddard (1997, p. 3) agrees with Wood's quote "what is most common is the notion of one person giving advice, knowledge and support to another usually more junior person, and acting as a role model usually in the same organization". Goddard appreciates that a mentor has to play various roles including that of responder, colleague or initiator of change and identifies the need to develop a willingness and ability to offer helpful assistance and feedback on practice. The role of the mentor is often seen as a form of collegial supervision with the role involving a special relationship of trust. Goddard (1997) sees those being mentored as being dependent upon their mentors for protection and to show the mentees the way to develop their skills and insights more fully. Ackerman, Ventimiglia and Juchniewicz, (2002, p.1133) provide a very comprehensive and clearly written discourse on the meaning of mentoring. They are, looking at the meaning from both a conceptual and theoretical perspective, initially

stating that the word "mentor" may call to mind an image of teacher, advisor, guide, protector, coach or sponsor. Mentoring occurring within a "framework of a relationship and is multidimensional, caring and transformational including professional and social elements", leading eventually to a culture of change within the organization that the mentee belongs to Ackerman, Ventimiglia and Juchniewicz, (2002) go on further to look in detail at relationships, these relationships involving a "complex and evolving process of interpersonal interactions". This, in my opinion, brings to mind the role of a counsellor rather than a mentor as it focuses on an in-depth personal relationship but also acknowledges the involvement of both personal and professional life. Another approach to the mentor role is shown by Griffith and Taraban (2002) who promote the use of reflective processes of on-line case narratives (real-life stories) to encourage dialogue with mentees. These case narratives are seen as a powerful tool for connecting the discourse from universities with the experienced practitioners (in this case, school leaders), connecting theory to practice. The mentor guides the discussion by probing directly, by challenging or simply observing the discussion process, with feedback playing an important role. Stoll, Fink and Earl (2003, p. 95) refer to mentors as powerful models for novice teachers as they describe their own learning goals and help protégés craft meaningful challenges of their own. Power and Hine (2003) explain that the term mentoring includes the development of a relationship that fosters the understanding of a new role but also emphasise ideas of collegiality and support. In this case as described by Power and Hine an accomplished teacher, with at least ten years experience, acts as the mentor, with the mentee through experiential learning, internalizing the values of the mentor, participating in problem-solving and eventually becoming independent of the mentor. The situation where the mentor is also the assessor draws mixed views: Power and Hine cite Parsloe and Watson (1995) who positively discuss situations where the mentor monitors the performance of mentees and Smith and Alred (1993, p. 113) who claim that it is difficult for the mentee to "talk honestly about their feelings and failings" if the mentor is responsible for assessment. Portner (1998, p. 6) simply takes the view that a mentor cannot be an evaluator. This highlights the necessity of differentiating between the roles of mentor, supervisor, assessor. Other terms also in common use in schools are peer coaching, buddy,

critical friend, reflection partner and appraisal leader. This also links with professional learning communities.

I see the role of mentor (myself as researcher in this case) as being that of an experienced practitioner, connecting theory to practice, guiding and observing the discussion, modelling some skills, with a two way learning process occurring between participants and mentor.

2.2.4 Attributes of the mentor and coach

The literature points to many attributes that a mentor needs to possess in order to promote successful mentoring. A mentor is a person who develops trust, provides nurturing, is an excellent communicator, is a continuous learner, is a friend and facilitator, with a positive outlook. These attributes are key ideas from those that are discussed widely in the literature. Hopkins-Thompson (2000) speaks of trust as a key component, Allen and Poteet (1999) mention three stand-out criteria, one being trust and the others open communication and the setting of standards of expectation. Barnett (1995) identifies also that mentors need to possess trust and respect. In a coach's role, trust is also an essential factor which enables effective professional support and learning to occur, particularly in identifying the teacher's real needs. Along with trust is confidentiality. This brings an interesting discussion on the amount of contact time that a coach needs to have with a teacher to allow that trust to develop and embed. Other particular qualities mentioned by Barnett (1995, p.2) that go along with trust are being warm, caring, sensitive and empathetic: "being able to nurture support of other people". Rowley (1999) in his article "the good mentor" lists six basic qualities of the mentor, coach as being:

- highly committed, this includes being prepared to be trained as a mentor,
- accepting and showing empathy,
- skilled at providing instructional support in providing a research based framework as the basis for reflection, refining conferencing and feed-back skills,
- effective in interpersonal contexts with a deep understanding of their own communication styles,
- a continuous learner,

- a communicator of hope and optimism.

Ackerman et al. (2002, p.1137) highlight the importance of skills such as listening, questioning, reflecting, supporting and challenging, co-constructing knowledge, and the development of self awareness. They provide an emotive quote from Palmer (1998) "the best gifts we receive from great mentors is not their knowledge or their approach to teaching but the sense of self they evoke within us."

2.2.5 Issues in Mentoring

Some of the issues in mentoring that arise are those of time, power relationships, lack of skills, inappropriate pairing of mentor and mentee, coach and coachee, availability of suitable people, ethnicity, race, age and gender. These issues all impact on an effective relationship. Sernak and May (2003) see gender as having a significant impact on the type of responses given by the mentee and the interpretation of those responses by the mentor. This may not be so in all mentoring situations, the success being dependent more on the calibre of the mentor rather than gender. In exploring the experience perhaps rather than the expertise of the mentor as a factor, Ackerman et al. (2002) ask whether it is sensible or even helpful to support new leaders by a process which socializes them into the occupational norms of the 'old hands'.

Barriers to effective coaching and mentoring are the lack of time, to effectively carry out the mentoring process and the coaching role, to create profound change in professional learning and to ensure sustainability (on-going implementation of the effective change). Sparks (2005) argues that the "final 2%", through processes such as reflection, critical friends, and transformational change, have to be in place as part of the mentoring and coaching role.

In summary, mentoring as a powerful agent of change is growing in our schools, allied with this is coaching. The literature supports the view that both roles used effectively provide a vehicle to enhance professional dialogue and learning in schools. The roles of mentor and coach are given a wide range of definitions in the literature. In my opinion, they are distinguished by the mentor being a practitioner

with more specialized knowledge and experience. Otherwise the roles are very similar but it is important to acknowledge that mutual learning occurs in both roles.

2.3   **Professional development**

It is helpful to clarify that in the literature and in everyday usage by educators there is an interchangeable use of the terms professional learning and professional development. It is therefore useful to have these terms further clarified as to their meaning in this research report. Guskey (2000, p. 16) defines professional development as "those processes and activities designed to enhance the professional knowledge, skills and attitudes of educators so that they in turn improve the learning of students". It is an intentional and ongoing and systematic process. Over time the term professional development has taken on connotations of delivering information, whereas professional learning implies an internal process through which individuals create professional knowledge. All professional development experiences should promote professional learning (Timperley, Wilson, Barrar and Fung, 2007). In fact the two, professional development and learning, go hand in glove. The professional development provides the framework for the learning. In this study the term professional development is used in the sense described by Guskey (2000) that is, those "processes and activities used to enhance understanding". In this study the understanding is of the process and skills of coaching and mentoring by the emerging leaders which in turn support professional learning not only by the emerging leaders but also by the researcher.

There are many types of professional development frameworks used by schools and teachers either in school or off campus. They range from in-school in-depth work with whole staff to one-to-one work between facilitator and teacher. In addition, courses provided off school campus may occur, some with in-school components and others in the form of one, two day courses or as virtual clusters on-line (Barnett, 2007). Professional qualifications, teacher action research, and the coordinated development of resources, to name a few, are also forms of professional development to assist teachers' learning.

Since 1989 when a significant change took place in the educational administrative policies in New Zealand which located the responsibility for governance within each school with the formation of Boards of Trustees, the responsibility for professional development also became that of each school. This change in policy led to significant changes in the method and nature of professional development delivery. Certainly over the last ten years the following transitions have been reported in the Ministry of Education School Support Services contract milestone reports. A summary of these changes is presented in the figure 2 below. These transitions over the last ten years have helped to promote more effective professional development models and professional learning for teachers. Pigot-Irvine (2006) discusses how precursors such as cultural norms, principal's role and planning, all impact on the effectiveness of professional development and how that effectiveness is linked to promoting changed practice.

Figure 2: The Changing Face of Professional Development

Coverage large numbers ⟶	smaller numbers
One off workshops ⟶	series with follow -up
Surface learning ⟶	in-depth learning
Transmission ⟶	transformation
Strategies/activities ⟶	underpinned by theory
Discrete ⟶	sustained
Facilitator as deliverer ⟶	Facilitator as coach/mentor
Teacher focused ⟶	student learning outcomes focused
Addressing a P.D. want ⟶	evidence and data to identify the P.D. need
Individual learning ⟶	learning community
Workshops ⟶	one to one

(Hand out from NZARE workshop, Barnett, 2005)

Pigot-Irvine (2006) produces a summary list of the features that contribute to an effective professional development programme. She highlights the multiple and intersecting dimensions and that these include the incorporation of the principles of adult learning, programme components themselves and expert facilitation. One of

the big challenges for professional development and learning programmes is the
ability to clearly identify causal links between the learning by teachers from the
professional development programmes and the programme's impact on student
learning and outcomes. Timperley, Wilson, Barrar and Fung (2007) and Hewson
(2007) all talk about the complexity of showing the direct effect that professional
development has on student outcomes. In figure 3 below Timperley, Wilson, Barrar
and Fung (2007) show these links. They point out the overarching impact of the wider
social context, such as educational policies, society and the current discourses on
learning. In turn the professional learning contexts such as the people involved in
both the learning and the provision of the professional development programme have
significant impact.

**Figure 3: Framework for Analysing the Effectiveness of Professional Learning
Experiences**
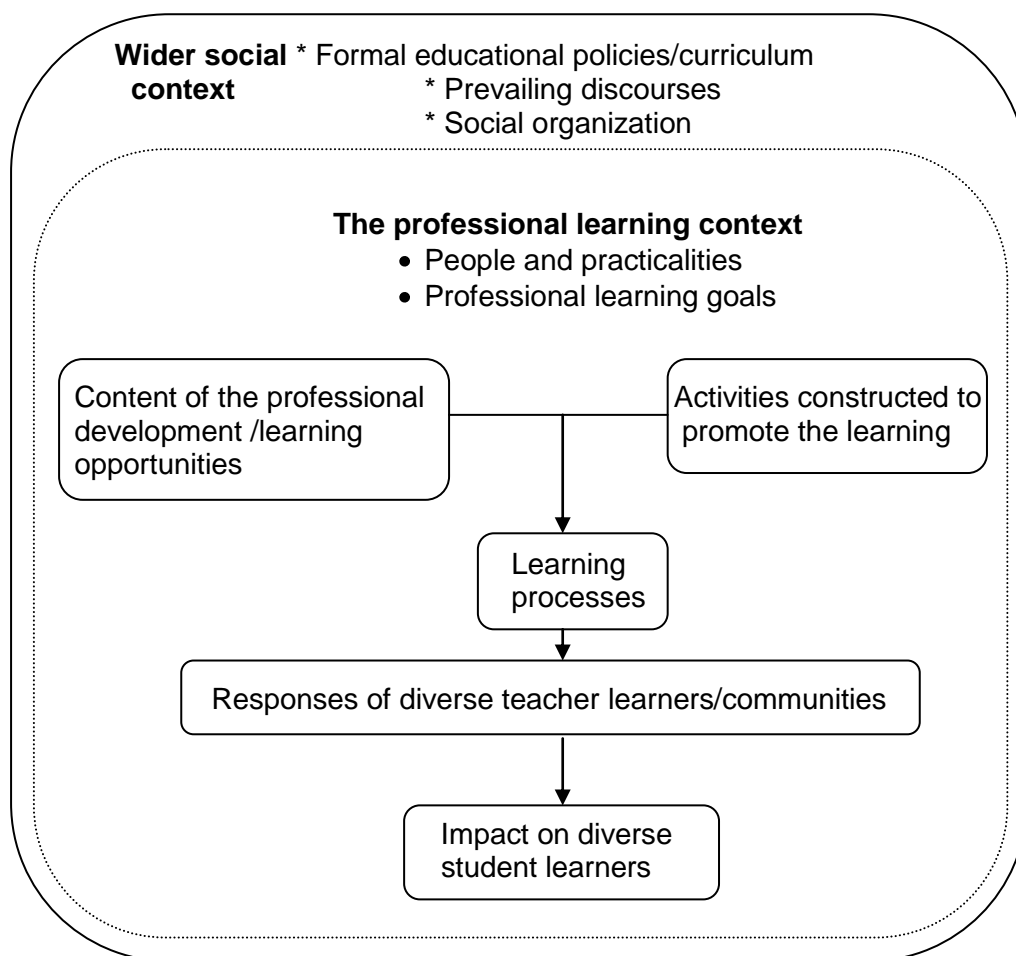
(Taken from Timperley, Wilson, Barrar, Fung. 2007 p.24)

This has also been supported by Hall (2006) with his research into evaluating the effectiveness of professional development programmes in the Waikato region, where teachers identified the particular individual adviser (in-service teacher educator) as a key factor in assisting their learning. The practicalities such as the location, time, number of teachers involved, ability to manage time away from the classroom along with the number of new initiatives and the amount of change and goal setting being required of the teacher all impact on the effectiveness of the professional learning experiences.

In both numeracy and literacy at primary schools, links have been made showing that the students' outcomes have improved significantly as a result of a professional development programme. (Ministry of Education schooling improvement projects SOAR, PEN 2007). Standardized assessment tools were used to collect the data, these tools being already in use by the teachers as part of their usual practice. The students' data collected before the professional development intervention and then after showed a significant improvement in the students' outcomes as compared with previous years when there was no intervention (Barnett, 2007). Providing data to show the link to student learning outcomes is not part of this study. In researching into the literature for professional development specifically in science the selection is sparse. Hewson (2007, p. 1182) states that "research on teacher professional development in science is inherently complex", consisting, as emphasized by Timperley, of a number of interrelated components. Bell and Gilbert (1996) who have carried out professional development research specifically in science use a different approach and emphasize that there are three different developments, personal, social and professional. These developments each go through three different phases.

The first phase of personal development is where teachers come to realize that aspects of their practice are problematic. In social development the first phase is when teachers become aware of their professional isolation and then come to see the value of collaborating with their colleagues involving their renegotiation and reconstruction of their shared knowledge about what it means to be a teacher of science. In professional development, the first phase is when teachers are prepared

to try out new activities in their classrooms. The second and third phases expand on these developments.

Hewson (2007) also explores the dimensions of teacher professional development in science. He sees it as being firstly, about teachers and their teaching activities involving curriculum, instruction and assessment, secondly, it is about teachers being professionals who have an extensive knowledge base of conceptions, beliefs and practices that they bring to their everyday classroom work and thirdly, it is about teachers who are adult learners continually learning throughout their lives and lastly, it is about the nature of science and the bodies of knowledge about the natural world that give science its distinctive character. Hewson (2007) also talks about the importance of the role of good professional developers. At the heart of this role, is a design framework which can use parts of many different professional development models. He talks about the series of inputs into the steps of a planning process (Hewson 2007, p.1186) highlighting critical issues such as the issue of leadership with respect to ensuring an environment (culture) in the school that facilitates teachers transforming professional development into classroom practice, teachers helping teachers. I see this as one of the key roles that is often taken by an emerging leader. Aligned with this is the need to build capacity for sustainability of change not just as maintaining the status quo but as the ability to scale up the change over time. Fullan (2005, p.22) describes sustainability as requiring continuous improvement, adaptation and collective problem solving in the face of complex challenges that keep arising. To enable this to happen you need emerging leaders at the middle of the school structure to support and build capacity for sustainability. Hewson (2007) identifies the final major input into professional development design as strategies, such as implementing the curriculum, examining teaching and learning, immersion in the science content, teacher collaboration and through teaching itself by the facilitator using coaching and mentoring and modelling. This again shows the link between coaching and mentoring and professional development. Hewson does not see strategies as an end point in themselves but as a means of achieving the goals already set. Professional development in itself is not an end point; professional learning done by teachers through a professional development programme needs to be reflected in a change in students' outcomes.

Mentoring and growing these improvements is a challenge for schools particularly if the external facilitator (adviser) is directing the process. This challenge can be met by the professional learning in the school being supported, nurtured and coached by a leader within the school. This may be the principal but more frequently it is an emerging leader that takes on this role. This can lead to the formation of small teams of teachers as a community of practice or professional learning community within the school.

2.4   Professional learning communities

Professional learning communities have become very common practice within schools and school communities. Professional learning communities can develop as a result of effective professional development and coaching if, as Southworth (2002, p.13) said, "most of the professional learning will be focused on enhancing teachers' classroom knowledge, understanding and skills in order to facilitate pupils' learning". It is a challenge of this research to see if the coaching and mentoring skills developed by the emerging leaders, as a result of the professional development programme, enable effective small learning communities to be set up. These communities will be set up to support the learning of the teachers in their schools in a science context and to develop further science learning and programmes.

There are many different approaches, characteristics and definitions of professional learning communities. Mitchell and Sackney (2000) cited in Stoll, Fink and Earl (2003, p.132) define a learning community as "a group of people who take an active, reflective, collaborative, learning-orientated approach to the mysteries, problems and perplexities of teaching and learning". An effective professional learning community has the capacity to promote and sustain the learning of all professionals in the school community with the collective purpose of enhancing pupil learning. Stoll (2005) identifies seven key components to a learning community. She sees these as: growing a learning culture, being inclusive and empowering, nurturing trust and collaboration. She cites Bryk and Schneider (2002) who identify a further four dimensions of relational trust, respect, competence, personal regard for others and integrity. The additional four components mentioned by Stoll are designing deep learning experiences, promoting inquiry mindedness and innovativeness, connecting

people and ideas and ensuring supportive structures. These seven components can be enhanced and embedded through the use of coaching and mentoring skills.

For a professional learning community to operate Stoll (2005) identifies the following key supporting mechanisms that need to be in place: time to meet and talk, use of space, resources, communication mechanisms, school development plans, professional development coordination and planning, staff deployment and hiring policies.

Hord (2004) supports in general the seven components of the professional learning community that Stoll highlights but gives greater emphasis to shared values and vision including an "unwavering commitment to student learning that is consistently articulated and referenced in the staff's work" (Hord, p. 7). She emphasises shared practice that involves the review of a teacher's behaviour by colleagues and includes feed-back and assistance activity to support individual and community improvement. This again reflects the importance of coaching and mentoring skills, in particular observation and evaluative feedback. Stoll and Hord hold the view that effective learning communities require a supportive high trust environment, vision and values along with feedback and a strong link to improvement in student outcomes.

Learning communities are not always successful and in research carried out by Timperley et al. (2007) they point out that the teacher talk and the outcomes of a learning community are unsuccessful unless there is a clear focus to improve student outcomes and to develop new understandings. Timperley et al. (2007) use the term professional community of practice as a community "whose members are supported to process new understandings and their implications for teaching." Qualities that promoted teacher and student learning were clearly identified as those qualities where support is given to participants to process new understandings along with the implications of those new understandings to teaching, qualities such as challenging dialogue as opposed to discussion including the use of external expertise to bring in new perspectives and assist in developing dialogue (Timperley et al., p.203). These qualities again relate directly to the role of the coach and mentor. Wenger (2002) has written a considerable number of papers on communities of practice and he

emphasizes that the focus of a community of practice is not just a community of common interest but a community of practitioners who develop a shared practice.

The term community of practice is also used in the business and technology worlds emphasising that the focus of the community is on the practice. In education frequently a professional learning community does encompass this focus on specific practice. This is acknowledged by Annan, Lai and Robinson (2003, p.31) who focus on the effectiveness of teacher talk in learning communities. They say that teaching practices significantly improve student learning, if teachers focus primarily on teaching practice and their students' learning and if they reflect on and enquire into the effectiveness of their existing practices and implement alternatives that improve student learning. They identify three types of learning talk, analytical, critical and challenging talk which are all interdependent. These also form an important part of the role of a coach (emerging leader) when working with teachers. This is supported by Sutton (2005) quoting Stein and Spillane (2003) who emphasize that interactive theories of learning start with the premise that learning is something that happens between people when they engage in common activities. As individuals exchange views, listen to and critique others' contributions and expose their own beliefs and assumptions, they create a shared new understanding.

Coaching and mentoring skills enhance the quality of teacher talk within the professional learning communities, they set ground rules for listening, use reflective questioning and interviewing, discussion, effective dialogue and goal setting along with evaluative feedback on classroom practice. In this research we are exploring how effective these skills are in assisting leadership in the setting up of a small group of teachers as a professional learning community.

Summary

This chapter explored the literature incorporated in the main aspects of this research study. The main aspects were those of leadership, emerging leadership, curriculum leadership, coaching and mentoring, professional development and learning communities. The literature has supported the argument that a school that has a distributed leadership model rather than just a top down model, provides the supportive culture that encourages the growth of the emerging leader. The literature

illustrates that the skills for coaching and mentoring form a key part of a leader's role, in particular, that of an emerging leader where teachers are coaching teachers. Effective professional development can provide opportunities for emerging leaders to develop coaching and mentoring skills. These skills can be developed through the formation of professional learning communities. This gives the emerging leader the opportunity to practice not only coaching and mentoring skills but also to identify a key focus for curriculum teaching and learning. A learning community also provides the opportunity for sustaining this change.

How these link together in the research will be seen in the next chapter 3 on research design and process.

Chapter Three: Research design and process

Introduction

This chapter sets out the research design and processes used in this study on the effectiveness of the use of coaching and mentoring as a professional development process to develop leadership skills in emerging leaders. It refers to naturalistic inquiry and action research emphasizing reflection and collaboration as part of action research. It covers ethical concerns, trustworthiness, the process used for this study, the professional development model and programme along with methods of data collection and data analysis.

3.1 Naturalistic inquiry and action research

The research in this study encompasses the methodology of naturalistic inquiry, that is, research in the natural setting (Cohen et al., 2000, p.141). This methodology involves many steps but it has a particular emphasis on identifying and addressing ethical issues such as "How does one present oneself in the field?" Involved in this are issues of informed consent and the tension between covert and overt research, as the more participants know about the research the less naturally they behave. The naturalistic inquiry methodology appears to highlight interpersonal ethics more than other methodologies (Cohen et al., 2000). Interpersonal ethics is certainly an issue when working in this particular research especially in deciding on the type of questions to ask in an interview, and in "guiding" a reflection session. This aspect is further highlighted because I am known to be a provider of professional development programmes to schools, meaning there was an expectation by some school leaders that additional funding would be provided to the schools for teachers to be released so that they could be involved in this research. This expectation was not met. Naturalistic inquiry often involves a qualitative approach.

Qualitative research is a research approach that looks in-depth at fewer subjects through rich description of their thoughts, feelings, stories, and /or activities. Maykut and Morehouse (2000) when referring to qualitative research talk about eight characteristics. These characteristics involve an exploratory and descriptive focus,

which is particularly suited to phenomena where people are participants and where there is a general focus of inquiry. In this study with a focus on leadership, the participants have a focus on inquiry as they explore the aspects that make up a leadership role. Secondly, Maykut and Morehouse talk about emergent design as a key factor in qualitative research. This enables a broadening or narrowing of the focus that is important to study. They refer to a purposive sample and data collection in the natural setting, which highlights the need to purposefully select participants and to collect data within a context such as a school. In this research the participants have been selected as having emerging leadership roles and are using the process promoted in the research as part of their existing practice within their schools. The fifth characteristic referred to by Maykut and Morehouse gives emphasis to the "human-as-instrument" in which the researcher has the added responsibility of being both the collector of relevant data and the culler of meaning from that data. This is the role that I, as the researcher, am taking in this study. Two further key characteristics of qualitative research are qualitative methods of data collection, which involve mostly gathering people's words and actions, and early and inductive data analysis. Early data analysis enables the researcher to capture the key ideas that the data from the participants show and what the trends are likely to be. This early data analysis encapsulates the key idea that what is important in the research is not predetermined by the researcher, but by the emerging data. Lastly Maykut and Morehouse highlight that the results of qualitative research study are most effective when presented with a rich narrative, meaning that a case study method is useful in reporting outcomes. Although this research certainly fits with these criteria, the research used will be an action research process rather than a case study, as explained next in this chapter.

3.2   Action research

An action research process is used in this study. After reading about common research methodologies in education, I concluded that action research is the methodology that best suits the research carried out in this study for the following reasons. Robertson (2005, p. 76) defines action research as "a process involving cycles of action, which are based on reflection, feedback, and evaluations of previous actions and the current situation, data are gathered and these inform future decisions

and actions". She further explains that this type of research is favoured by people who want their research findings to have an impact on the situation or context as the intervention takes place. In this case it often puts the practitioner and the participants as the researcher.

Action research is intricately interwoven with the change in understandings by the participants and the researcher as the research takes place. It is flexible enough to allow for the emerging findings and participants' understandings to shape the direction of the learning and research. Cohen and Manion (2003) discuss the benefits of action research as empowering participants through research involvement, helping to develop reflective practice, promoting collaborative research leading to the solution of "real" problems and promoting praxis and equality, calling it stakeholder (participant) research.

Robertson (2005) further states that many other theorists and researchers propound action research as a powerful means of building learning communities and influencing practice. This lines up well with my research which is also exploring as a possible outcome the setting up of a small learning community. Cohen and Manion's views of action research fit the purpose of this research where an intervention (professional development programme) is provided by the researcher in the form of workshops (on coaching and mentoring for leadership) along with feedback.

Action research is also seen as professional development, improving teaching skills, developing new methods of learning, increasing powers of analysis and heightening self-awareness (Cohen et al., 2000) and not just as research or a process of change. This is important to this study because there is a planned professional development component and it is also set up on the premise that teachers will learn from each other as they participate in various activities and methods during the process.

Cardno (2007) refers to the spiralling nature of action research illustrated in figure 4 below. As different issues and ideas arise a new cycle tackles the new dimension of the original issue. In each cycle there are three major phases: investigation and analysis, planning and action, and evaluation and reflection.

Figure 4: Action Research Model

1 Phase 1/3 2 Phase 2 Phase 3	Phase 1 Reconnaissance
	Phase 2 Intervention
	Phase 3 Evaluation
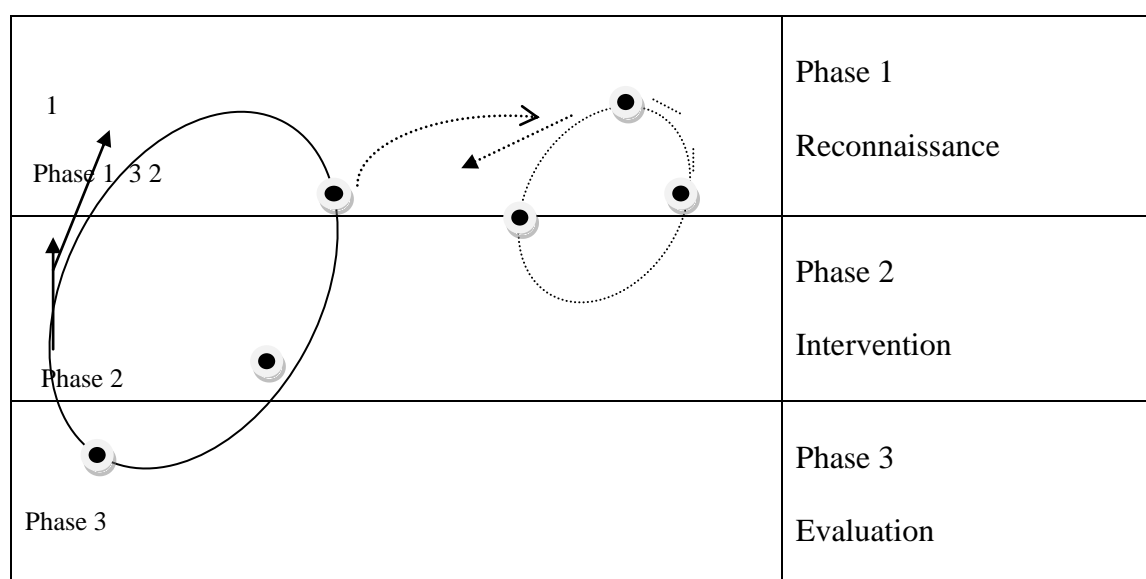
(Cardno, 2007, p.13)

Implicit in action research is the notion that it also improves the participants' learning as they involve themselves in the research practice, in that "action research is self reflective, self critical with critical enquiry undertaken by professionals to improve the rationality and justice for their own practice, their understanding of these practices and the wider context of practice" Lomax (1996, p. 21). The components of action research practice also form key components of professional development for the participants. They also link to the idea of teacher talk (Annan, Lai and Robinson 2003, p. 31) where teacher talk enables a community of learners to develop and share key ideas.

In this study I, as the researcher, identified the main focus (the use of coaching and mentoring as a tool to develop leadership) of what I wanted to achieve. From a series of group reflections and questions asked of the four emerging leaders (participants) at the workshops, as part of a professional development programme, a further cycle of changes in understandings by both myself as the researcher and the participants developed. This process links strongly to the phases in Cardno's model in figure 4. In particular, it links the use of reflection as part of reconnaissance (Phase 1) and evaluation (Phase 3). Pro-actively making time to carry out reflection is essential both to action research and in the formation of professional learning and development

programmes. Within this study, reflection and collaboration are highlighted as critical aspects of action research.

3.2.1 Reflection

Reflection is highlighted in this study. Reflection is the key to action research, without reflection it cannot happen. Action research including reflection exposes and assists teachers to be involved in double loop learning (West-Burnham, 2005). Double loop learning as opposed to single loop learning is more in-depth, involving links being made between idea and theory. It is an indicator of higher quality teacher talk, and can act as an indicator of professional practice discussions (Robinson, 2005). Action research fits with the coaching model in that it encourages leaders to take time and reflect on their actions and proposed actions. During this study the participants were asked to reflect both with their colleagues and as part of the group of four emerging leaders as they moved through each part of the action research cycle. This reflection on practice was then used to plan the next stage in working with their colleagues as well as informing the professional development programme workshops.

3.2.2 Collaboration

Closely related to reflection is collaboration. Cohen et al., (2000) state that, "the approach is only action research when it is collaborative, though it is important to realize that the action research of the group is achieved through the critically examined action of individual group members into their own practice." Action research involves research by the teachers on their own work and is seen as part of their regular work, not as an add on, but it is not necessarily the usual thinking that teachers do when they think about their teaching. It is more systematic and collaborative in collecting evidence which can form a basis of rigorous group reflection.

It is not simply problem solving. Action research involves problem posing and is motivated by the quest to improve the work. In this research the teachers were interested in improving their emerging leadership understandings and skills, through working with other teachers in their schools to explore science programme delivery. This in turn is expected to assist the emerging leaders to become empowered to lead change. Action research therefore implicitly relates to the development and growth of

learning communities where teachers reflect on their practice and promote inquiry mindedness and innovativeness, connecting people and ideas (Stoll, 2005).

3.3   Ethical concerns

A researcher has a responsibility to protect their participants. Cohen, Manion & Morrison (2000) emphasize ethical issues in educational research of action research where methodological and ethical issues are inextricably interwoven and need an extra awareness from the researcher. Principles of procedures for action research accordingly go beyond the usual concerns for confidentiality and respect for persons and define, in addition, appropriate ways of working with other participants in the social organization. Hopkins in Cohen et al., (2000, p.67) confirms that the researcher's actions are deeply embedded in an existing social organization and the failure to work within the general procedures of that organization may not only jeopardize the process of improvement but existing valuable work.

In this research it was vitally important to understand the context (culture) and systems of the schools to prevent the participants being placed in a stressful position, as to the timing of the workshops, data collection, and additional activities involving other staff. Cardno (2003), in addition, highlights that New Zealand is a small country and it is vital, therefore, that the identity of the schools and teachers involved are kept confidential. In carrying out this study the following ethical issues have been addressed:

1. Informed consent, gained prior to this research. All participants plus the principal were sent letters explaining the details and involvement required for this research. Their informed consent was gained before the first data collection took place. (See Appendix A)

2. Confidentiality. All participants have been given pseudonyms. Care has been taken not to use any key identifiers of schools such as location and demographics. Prior to workshop discussions clear guidelines were stated as to the confidentiality of conversations, both inside the workshops and at in-school discussions. This is dealing with personal material in the coaching and mentoring sessions and at in-school interviews.

3. Schools will also be offered a copy of the final report.

4. Potential harm to participants. Assurance has been given to the participants that the issues discussed at the workshops and interviews will be treated sensitively. The participants have all been given the opportunity to review and withdraw any recorded, then transcribed, data. Professional development workshops have been run outside of school hours. While this is onerous on the participants, it has not impinged on the learning and teaching time for the students.

5. Participants' right to decline to participate and right to withdraw. It was made clear to participants that they have the right to withdraw at any time during the research. All participants have willingly agreed to be involved. This was verified by the researcher at an individual visit to each teacher prior to the start of this research.

6. Arrangements for participants to receive information. These were made in writing through letters then through email directly to each participant (see Appendix B) as well as face-to-face at the five workshops.

7. The use of information. The data will be used for this thesis and may also be used for presentations and at conferences. The participants will be made aware of and permission sought if it is to be used for any other purpose.

8. Conflicts of interest. In this case, care has been taken that no judgment on the teacher's performance, including discussions, will be given to the participant's principal or School of Education colleagues, including School Support Services staff. If there is any conflict of interest the participant is to be notified immediately.

9. Cultural and social considerations. Very few special cultural and social considerations have been identified in this research. The four teachers involved have similar cultural backgrounds. Workshop timings have been adjusted to suit school and social needs, appropriate venues and refreshments provided.

Cohen et al., (2000, p.68) discuss a list of ethical principles for the guidance of action researchers. From their list there is an additional comment not covered by the above nine points, that is, the importance of the progress report, to keep the research work

visible and remain open to suggestions so that unforeseen and unseen ramifications can be taken account of by colleagues and participants. This is addressed in this research through the regular meetings and emails with both participants and thesis supervisors. The over-riding factor for action researchers to remember in dealing with ethics is that any research involves risk to the individuals involved. Busher (2002) in Cardno (2003, p.59) sums this up by saying that "in the end researchers have to take decisions about how to carry out research that makes the process as ethical as possible within the frameworks of the project."

3.4   Trustworthiness

Trustworthiness is a criterion for assessing a qualitative study. Lincoln and Guba (1994) in Bryman (2004, p.273) propose that trustworthiness is made up of four criteria: credibility, transferability, dependability and confirmability. Trustworthiness along with authenticity sits very comfortably within action research.

3.4.1 Credibility
Credibility parallels internal validity in quantitative research (Bryman, 2004). Mutch (2005) generalizes the term validity to mean ensuring that a study actually measures what it sets out to measure. In this qualitative research study, data validity can be addressed through the honesty, depth, richness and scope of the data achieved, the participants approached, the extent of the triangulation and the objectivity of the researcher. (Cohen et al., 2000)

In this research we are looking at credibility as there can be several accounts of social reality. The credibility of this account that I, as the researcher, arrive at is going to determine its acceptance by others, in that an explanation of a particular event, issue or set of data which the research provides can actually be sustained by the emerging leaders involved in this research. For this reason, in order to confirm information and enhance credibility of this study I followed several strategies. Transcripts of each person's interviews were sent to them for verification that it was a true record of what was said and also offering the opportunity to make changes if need be. Findings from the group reflections in the form of themes were shared with the group and this also validated that the themes were genuine from the participants' point of view as well as those of myself as the researcher. This allowed for multiple

views of the data. This technique is referred to as "member validation" (Bryman, 2004). The findings must accurately describe the phenomena being researched (Cohen et al., 2000). External validity refers to the degree to which results can be generalized to the wider population, cases or situations. The issue of generalization is problematic especially in this research when the sample is small (four emerging leaders) and the situation unable to be exactly replicated. This study is further validated by the requirements of The University of Waikato ethics committee with approval required before this research could take place. On-going rigor was maintained through regular close supervision while working on this research study.

Triangulation is also a strategy used to confirm credibility. Cohen et al., (2000) describe triangulation as a multi-method approach to a problem, using multiple sources of data or multiple perspectives to confirm the data. Triangulation is used in this study to help provide validity for the data collected. The data from questionnaires, interviews and reflection on workshop dialogues backed by journals are the three data collection methods used in this study.

3.4.2 Transferability
As this is a study involving few individuals and the findings are uniquely contextually based the transferability is questionable. The extent to which it can be transferred can be judged from the thick description, which holds a detailed account that can provide others with a database, from which they can make judgments on its transferability to another context (Bryman, 2004).

3.4.3 Dependability
Dependability is given as a parallel to reliability in quantitative research. This action research study is small and situational, therefore, to be able to show reliability poses a challenge (Cardno, 2003). In qualitative research, Bryman (2004) suggests that this could be shown in the form of an audit where complete records are kept of all phases of the research. This helps to ensure that the researcher does not allow personal bias to influence the findings. In this study records have been kept of all interview transcripts and direct quotes of teachers' words used to validate themes identified through the data. Records of meetings, professional development workshops contents, ethical permission, and consent forms have all been kept in an accessible

place indicating that proper procedures have been followed. In addition on-going guidance is provided by my supervisors.

3.4.4 Confirmability

Confirmability is concerned with ensuring that the researcher has acted in good faith, that I, as the researcher, have not allowed personal values or theoretical inclinations to sway the conduct of the research or the findings from it. The views in this research have been taken from the findings through the data collected from the participants. The setting up of this research was based on discussions with colleagues, professional learning through academic papers and issues raised by other teachers over many years of working in the in-service sector.

3.5 Process for this study

3.5.1 Research question

The first design decision was centered on the formation of a research question as this determines the shape and purpose of the study. Mutch (2005), suggests the following factors need to be considered when selecting a research topic: size, scope, time, resources, skill, access to prior knowledge and motivation. The research question gives a clear direction for the argument and should succinctly inform the reader and researcher of the main focus for the research. In this research the focus was on inquiry encompassing discovery and description in an effort to gain a deeper understanding of the impact of coaching and mentoring and so the research question was:

How effective is the use of coaching and mentoring as a professional development process for primary school emerging leaders, using a science context?

3.5.2 The research participants - emerging leaders

The four "emerging leader" participants were selected from four large (over 200 students) city primary schools. Four was selected as a manageable number of participants for this research and it also enabled coaching partnerships to form within the group with a potential to form an on-going learning community. The participants were selected from recommendations made by the local primary science adviser and in consultation with local principals who were enthusiastic to have their staff involved. The first letters outlining the research were sent to four schools following on from an

initial phone call to assess the principal's interest. All principals approached agreed to their staff being involved. Each emerging leader, selected by their principal, has a current middle level responsibility within their school. Each school was required to have science as a focus in either term one or two, with two additional teachers prepared to form a professional learning community in order to support the coaching and mentoring skills in a science context with each emerging leader. The local primary science adviser was also consulted, as the coaching and mentoring skills are set within a science context. This was to prevent an overlap with the teachers who she was working with in science this year.

In each case the principal consulted with the emerging leaders concerned to see if they wished to be involved. The emerging leaders then selected the two other teachers to work with them, in consultation with senior management, either from within an established cluster of teachers in their own school or from different levels within their school.

My involvement

My interest in this research started three years ago, while I was engaged in taking a Masters paper on coaching and mentoring. As part of that paper, I explored the use of coaching and mentoring as an effective way of growing leadership skills. The coaching and mentoring process also enhanced the role of being an in-service teacher educator, providing professional development, when working in schools with teachers, to support change in both teaching and learning. The skills for coaching and mentoring have been identified as a key part of the role of an in-service teacher educator (Ministry of Education, 2008). Over the last two years, the use of background reading plus my own involvement in the use of coaching and mentoring skills in the School Support Services' organizational appraisal systems has led me to believe that coaching and mentoring skills could be very relevant to the development of emerging leaders.

3.5.3 Chronology of the research
This study in the main, took place over six months

Figure 5: Timeline for Research Study

Dates	Actions
February	Ethical approval gained from University of Waikato for research Principals and participants informed Ethics consent obtained from participants Visits to each school Questionnaires completed by each participant
March	Initial individual interviews carried out at the schools Workshop times negotiated Additional teachers' consent given First workshop Second workshop and group interview data collected
April	Third workshop and group interview data collected
May	Fourth workshop Fifth (final) workshop and group interview data collected
June	Final individual interview with emerging leader in schools
July – Dec.	Data analysed

3.6 Developing the professional development model and programme

The professional development model involved four teachers (emerging leaders) from four different, large (over 200 students), local primary schools. The teachers took part in this programme voluntarily in their own time during after school hours. The workshops were held off the school campus.

The model consisted of a series of five workshops on coaching and mentoring. In between each workshop, the emerging leaders practiced skills with their additional teachers, kept a journal and read related articles provided through the programme. In all cases the professional development was incorporated as part of the usual practice within their schools.

The guiding framework for the professional development programme was planned using the findings from the initial questionnaire completed by the emerging leaders. In addition, personal and theoretical knowledge of previous successful experiences of professional development programmes in using coaching and mentoring, including findings from the literature search, were used in the workshops' planning.

In brief, the five workshop sessions covered essential coaching and mentoring skills.

The following list sets out the content for the five workshops. This was subject to negotiation with the participants.

Workshop 1   Developing relationships /active listening

- *Teachers' views on their understanding of the term coaching*

- *Teachers' views on leadership*

- *Sharing current researchers' definitions of coaching*

- *Active listening practiced in pairs*

- *Professional learning communities*

- *Use of professional readings*

Workshop 2   The context interview/active listening

- *Reflection on teachers' practice of active listening*

- *Role of trust*

- *Journal keeping*

- *The context interview*

- *Reflective interviewing*

- *Leadership theories*

Workshop 3 Reflective interview and GROW.

- *Reflection on progress in using the reflective interview*

- *Successful coaching relationships*

- *Probing questions*

- *Grow*

- *Science as a context*

Workshop 4 Reflective interview continued and evaluative feedback

- *Reflection on progress in using Grow*

- *Exploring leadership capacity*

- *Practicing descriptive feedback*

- *Evaluative feedback*

Workshop 5 Evaluative Feedback

- *Reflections on data gathered*

- *Learning communities' progress*

- *Leadership explored*

- *Reflection on coaching and mentoring*

- *Future directions*

Process used for the workshops

Each session lasted approximately one and three quarter hours.
In between each workshop the emerging leaders engaged with their two additional
teachers forming a small professional learning community. They used their coaching
and mentoring skills to facilitate the development of their professional learning
communities. One emerging leader worked with her already established larger group
of six. The content of the workshops was negotiated between the emerging leaders

(coaches) and the mentor (researcher) as a result of their prior knowledge and learning experiences during the professional development programme.

3.7   Methods of data collection

Three different methods of data collection were used in this study. The methods were questionnaire, individual semi-structured interviews and recorded workshop reflective dialogues as group interviews.

3.7.1 Questionnaire

This was used with the four emerging leaders as a method of gathering prior views and setting a base line for the development of the professional development content for this study. Although questionnaires are often used with larger samples, in this case it was appropriate as the questionnaire tends to be more reliable and encourages greater honesty and is more economical in time (Cohen et al., 2000). It is honest in that the person is not influenced by either the researcher's body language or other people's presence and more reliable in that it is written and can give the person time to think clearly about their personal response. In this case the questionnaire was completed electronically by email. Open ended questions for the questionnaire were based on the main foci in this study, that is, leadership, curriculum leadership, science curriculum leadership, knowledge of coaching and mentoring and the emerging leaders' current role.

3.7.2 Semi structured interviews

In this study there were two individual semi-structured interviews. These individual interviews occurred at the start and at the finish of the research. In addition three group interviews took place. The group interviews were carried out as part of each workshop. During these interviews the emerging leaders reflected on their recent practice carried out with the additional teachers in their own schools, as a result of the knowledge and skills used in the workshops. They used their personal journals to assist in the reflection.

The semi-structured interview permits greater flexibility than allowed for in the closed structured interview. It allows for participants' perspectives on the issue to unfold and

is more like a conversation with a purpose (Merriam, 1998). Probes as part of the semi-structured interview enable the interviewer to ask respondents to extend, elaborate, add to and provide detail for clarifying their response, thereby addressing richness, depth of response, comprehensiveness and honesty that are some of the hallmarks of successful interviewing (Cohen et al., 2000, Patton, 1980). The semi-structured individual interview was chosen as a useful way of obtaining fuller response. The participants answer the same questions thus increasing the comparability of responses, with data completed for each person on the topics addressed in the interview (Cohen et al., 2000). The questions again were framed on the main foci of this study. Further probe questions were asked during the interviews. In the two individual interviews the four emerging leaders were interviewed at their schools in a quiet location. For the first individual interview, the questions were given to each participant prior to the interview so that there was time to focus and think after a busy school day. The interview was digitally recorded so that it could be easily transcribed. The transcribed scripts were given to the participants to allow them to change or add where they saw fit. For interview questions see Appendix B.

3.7.3   Reflective Group interviews

In this case the group is a focus group reflecting on their practice as part of the professional development programme. It is focussed in that the group has a common focus with only a limited number of related issues to discuss. This method of interviewing enables the group to gain further insights into the process (of coaching and mentoring) through interaction and dialogue with each other at the workshops (Travers, 2006). Again a framework of questions was used with probes added as the discussion took direction. The interviews were digitally recorded and transcribed (See Appendices C).The emerging leaders also kept journals (personal written records) to assist them in their reflection at these group sessions (Robertson, 2005).
The codes used for these interviews are:

 I. For the first individual interview and If, for the final individual interview.

Q, for questionnaire

W1, W2, W3 for the three workshop reflective group interviews.

3.8   Data analysis

In a qualitative approach, data analysis is best conducted as an early and on-going research activity as this allows the research design to flow over time, suggesting the direction for subsequent data collection (Maykut and Morehouse, 2000, p. 123). This has been the practice for the data analysis and collection in this study. The data in this study are in the form of text having been transcribed from recordings at individual interviews and focus group reflections or written as a response to a questionnaire providing several accounts. An inductive approach, involving the identification of themes, has been used to analyze the data.

Qualitative data are powerful, they evoke vivid images and recapture remarkable events (Eisenhart, 2006). In this study there is a concern about how well the events, concepts, excerpts and quotes selected from the interviews represent the participants' interests. As a qualitative researcher my perspective is a paradoxical one as I need to be tuned into the meanings of others and at the same time be aware of my own biases and preconceptions that could influence the interpretation of the data. Bryman (2004) highlights that in qualitative research there can be more than one interpretation. To overcome this and ensure interpretive validity, Eisenhart (2006) the transcripts of individual interviews have been shared with participants (emerging leaders). The findings from the group interviews, in the form of trends, have been shared with the participants. Bryman refers to this as "member validation or checking". A dialogic approach to representing qualitative data that is directly from the teacher's voice has been used in the data analysis to support trustworthiness.

Cohen et al. (2000, p. 148) set out steps in the process of data analysis, which I have found useful in carrying out this study. Step 1; establish units of analysis of the data. This involves placing the data into broad categories or units of analysis. Step 2; create a domain analysis that is grouping the units into domains. The domain analysis involves identifying patterns, themes in the data gathered. Step 3; establish relationships and linkages between the domains. This process ensures that the data, their richness and context-groundedness are retained. Step 4, making speculative inferences, that is to give some possible explanations for the situations, moving into

hypothesizing. Step 5, summarizing by identifying key factors, issues concepts and key areas for further investigation.

The initial broad categories used in analyzing data from this research were the categories used in the literature search, that is; leadership, curriculum leadership, coaching and mentoring, professional development and professional learning communities. Therefore, the approach used in this research is that of thematic analysis or unitizing, while using a constant comparative method of data analysis in identifying relationships and patterns across categories (Maykut and Morehouse, 2000). These data findings will then be used to explore and explain the key question of this study, that is, *how effective is the use of coaching and mentoring as a professional development process for primary school emerging leaders, using a science context?*

To assist in analyzing the themes that emerge from the categories of data in this study, I anticipated the following focus areas:

- change in their perceptions of leadership and leaders ,

- change in their own practice as emerging leaders,

- progress in forming a small professional learning community within their schools.

In addition, there is an area of non fit, to encompass unforeseen themes that emerge. These themes in turn are placed into fewer domains with overarching themes. Cohen et al. (2000) talk about a domain as any symbolic category that includes other categories, items can also be assigned to more than one category and indeed this is seen as desirable as it maintains the richness of the data, a key aspect of qualitative research.

In sampling the data initially seven categories are used that relate to those that emerged in the literature review. This enables a reliable and more manageable sampling to be performed.

Summary

The research and design process chosen for this study takes a qualitative approach. It uses action research as the methodology. Action research has particularly suited this study which involved an intervention in the form of professional development workshops on coaching and mentoring. Action research has allowed for a process involving cycles of action, based on the reflections of the emerging leaders on their use of the skills learnt in the previous workshop and their feedback on their study findings about leadership. The data gathered from group reflections and semi-structured individual interviews also informed future decisions and actions for the professional development programme and the emerging leaders' own practice. This action research, therefore, enabled research findings to have an impact on the situation or context as the intervention took place. It has also put the practitioner (emerging leader) as the researcher in that the emerging leaders have kept journals of the changes in their thinking about leadership. This presented ethical implications for the researcher, who is providing the professional development programme content and at the same collecting data to show the effectiveness of the professional development programme, including the workshops, on the emerging leaders' practice. Triangulation of rich data has been applied in this study with three different methods of collecting data used through a questionnaire, individual interviews and group interviews. This has helped to make the research trustworthy and valid. Data analysis took place through thematic analysis. The themes and findings that emerge from the data will be examined in the next chapter.

Chapter Four: Findings from the coaching and mentoring programme

This chapter presents data collected from this study according to seven categories. These categories mirror those used in Chapter 2, with further sub-categories identified. The categories are: understandings of leadership and leaders, qualities of emerging leaders, emerging leaders as curriculum leaders, coaching and mentoring as effective leadership skills, science as a context for leadership, professional learning communities as a vehicle for developing leadership, and professional development models. The chapter concludes with a summary of the main themes. Please note that if a participant is not mentioned in the data this means that they did not make comment. The data gathered is rich as can be seen in the overlap between the different categories.

4.1 Understandings of leadership and leaders

During the period of time that the emerging leaders were involved in the professional development programme their ideas on leadership changed. At the conclusion of the programme they could identify differences between leaders and leadership along with strategies and theories that leaders used. From the analysis and synthesis of the data collected from the four emerging leaders, the following areas were highlighted under the broad categories of initial understandings and later understandings of leadership and leaders.

4.1.1 Initial understandings

All four participants gathered their ideas about leadership by observing and analyzing either what leaders in their school did or, in the case of one emerging leader, observing a leader in another educational context. When answering the question in the first interview (code I). "Where do you get these ideas [about leadership] from?" The following responses came:

> I went through the play-centre movement, saw it happening there. (Daisy/I)

> I suppose that I have picked up most of what I know about leadership from working with good leaders myself, as role models and trying to analyze what it is that they've done well. (Iris/I)

> From working here, that's how we work. (Rose/I)

> Just from what I see the leaders here. You don't really get taught what a leader is, that is at uni or anything like that. Pick it up by seeing leaders. (Violet/I)

These quotes suggest that their principal is the key role model that they had seen as a leader (with one exception). The model promoted by their own school provided the context for their own views on leadership and greatly influenced the development of their roles as emerging leaders.

When the emerging leaders were asked in the initial interview about their understanding of leadership, they did not distinguish between the terms leader and leadership. The four used the terms leaders and leadership interchangeably indicating that they were unclear of the difference.

During their initial conversations five main themes arose around leaders and leadership.

The first theme to be identified was the idea that *leaders need to have personal knowledge* to pass on. In her interview Daisy said, "essentially I see leadership as someone who's got the knowledge skills to pass on to others so you're passing on what you know". This conflating of the concept of leadership with the person as a leader, needing to be a person with knowledge to pass on, is also raised by Violet who says, "I think a leader is somebody who has got quite a good knowledge base". From another school, Rose, also speaks about the knowledge being essential to the leader's role.

All the emerging leaders alluded to the importance of the leadership role in *the provision of resources*. Resources included up-to-date information, written materials to support changes in curriculum delivery, equipment, information technologies to support learning communications, and professional development opportunities. When talking about the role of leaders as providing resources Violet implied she thought being knowledgeable included knowing about resources explaining, "they [the leaders] know what resources to use and things like that, they can help people with just ideas." (Violet /I)

Linking into the theme of knowledge sharing as a leadership skill is the *importance of communication.* This sense of communication as being part of leadership is emphasized by three of the emerging leaders. Violet explained, "I think a leader is somebody who has got quite good people skills, because if they are leading other people they need to be able to communicate." (Violet /I). Iris saw being an effective communicator as an important part of being a leader, "Communicating effectively, I (Iris) should have said that too, an effective communicator is something that I think a good leader is. That is something I have worked really hard on in my role." (Iris /I). Rose added that "an effective communicator is something that I think a good leader is". Interestingly she emphasized further that leadership can be carried out by a group rather than just the principal. "Within a school leadership should always be not one person dictating it, but a group of people deciding and being responsible" (Rose /I).

This links to further comments by Rose who was the only one who spoke overtly about a *supportive and high trust environment* and working as part of a supportive community as part of leadership. She did not link this to the idea of distributive leadership, as she had not been exposed to leadership theories at this stage.

> Every teacher has the support that you need to deliver …the expectations are fairly high in our school, but you're not left on your own to do it….. I felt very safe … all the information was available to me that I was going to need, I didn't get left in the lurch or anything and I just found that because that worked so successfully for me that's an ideal leader. (Rose/I)

The other three emerging leaders alluded to this "high trust environment" in the way that they spoke about their principals and their schools' culture but did not overtly make this point. They spoke of how their principals encouraged them to try new ideas in their classrooms and gave them positive feedback on the way that they worked with the children in their classes.

The fifth theme, raised by Iris, referred to *effective people skills* and the complexity of the leadership role.

> I think that leadership's quite complex in that there are lots of different parts to it, being able to keep in touch with what the staff needs are and give the time and give the support needed to allow

the people working with you to keep reaching their own potential. (Iris/I)

4.1.2 Later understandings about leadership

In the individual interviews at the conclusion of the coaching and mentoring programme (code If) the four emerging leaders were asked, what is your understanding of leadership?

Their comments showed some shift in their understanding about leadership. They were able to distinguish between leaders and leadership and were all able to talk about the aspects and process of leadership rather than the attributes and tasks of a leader. The professional development programme opened up ideas and possibilities about leadership through the reflection sessions at the workshops and the provision of some theoretical ideas about leadership. For instance, Daisy commented, "that there are different styles, different ways of leadership happening in a school situation" (Daisy/If). Iris also commented how they now know "that there are different structures of leadership" (Iris/If). Violet says that she found that "seeing the different types of leadership actually was interesting for me to pick out what was being used in my school. I think just how a leader works was completely new to me I think the sort of leader I am or am becoming is probably a bit of a servant leader". In the final interview Violet also showed a fuller understanding of the term leadership. Rather than looking solely at the tasks that a leader does but more at the processes ("better the school" "coordinate") needed for leadership. Violet in the quote below is talking about aspects of distributive leadership in stating that

> My understanding is that anybody can be a leader, doesn't have to be the top dog from school, I think a leader is somebody who works with other people *to better the school* in some way they're working with other people *to coordinate an action plan* or something. (Violet/If)

Iris adds "I remember the distributive theory… because that's possibly what I thought was happening here whereby leadership is shared" (Iris/If).

Other points raised were "the effect that different school environments [culture] have on leadership" (Rose/If). Daisy also commented on the *culture* "it depends on the culture of the school" (Daisy/If). Rose and Iris were also able to notice the *strategies employed by leaders*. "I just noticed the little things that he now does as a leader,

whereas before I probably wouldn't have even noticed that, that (strategy) happen"
(Rose/If).

To summarise, initially all four emerging leaders did not distinguish between the
terms leader and leadership. They relied heavily on single models drawn from their
own direct experience. Between them they identified three main aspects that they
attributed to leadership: leaders need to have personal knowledge, to organize the
provision of resources and have communication skills. In addition two participants
openly stated two further aspects as part of leadership; a supportive and high trust
environment and effective people skills. After the emerging leaders had engaged in
the five workshops their views of leadership were clearer in that they included the
acknowledgement of differences between leaders and leadership. They were able to
identify some of the theories, processes, ideas and strategies that contribute to
leadership and the effect on school culture. They had not previously discussed these
aspects.

4.2   Qualities of emerging leaders

As the workshops proceeded it was possible to trace changes in the participants'
ideas about the role and purpose of an emerging leader. Changes in their
understanding of the differences between professional and social talk, and
recognition of their developing leadership skills embedded in their role as an
emerging leader. Under the category of qualities of emerging leaders, the following
areas are explored: the emerging leader role, the purpose of the emerging leader's
role, professional talk versus social talk and linking further leadership skills to
coaching and mentoring skills.

4.2.1 Emerging leaders' roles
The four emerging leaders, all of whom held leadership roles with direct responsibility
for teacher learning, were asked the following question, in the initial questionnaire,
(code Q). What leadership role are you currently involved in? Their responses
showed there was considerable variety in the roles that they held as emerging
leaders. Daisy was a tutor teacher for the first time. Iris was leading the year 4 team.

Rose was the ENP (Early Numeracy Programme) lead teacher. Violet was a critical friends' group coordinator.

Their descriptions of their role indicated that they saw their role as leader of a particular group set in a context. With the exception of one participant, they did not see themselves as providing leadership as a process, in the same way as they had initially talked about their leadership understandings. This view is reflected in the following comment by Violet

> No, our school leaders are Principal, AP and DP but with the culture of our school we are all given chances to lead others in the areas we are strongest. (Violet/Q)

At this time Violet did not see herself as having a leadership role in the school as a whole.

4.2.2 Purpose of the emerging leader's role

All four emerging leaders saw the *role of a middle/ emerging leader as involved with influencing the teaching and learning* for other teachers. Daisy said that, "Senior management are more on the operating side of the school they [senior managers] are not aware of what's going on in classrooms, what teachers are doing, and the next level up might have that knowledge, um" (Daisy/I). Daisy, in this, emphasizes that the teaching and learning leadership is up to the "next level up" meaning "up" from the basic classroom teacher. She saw herself as having this "next level up" role. Iris, in the questionnaire, saw the role of middle leaders as "maintaining up-to-date knowledge of the content of curriculum, as well as current teaching and learning pedagogies, and supporting teachers in learning this". Rose concurs with this saying that the role is "to lead a small curriculum team, make decisions and plan together etc. To be available to provide support and direction for staff who need it." (Rose/Q). Violet and Daisy added further comments on the role with an emphasis on support for teaching and learning in the classroom.

To summarise, while the four emerging leaders had different roles. They all stated in the original questionnaire that they saw the emerging leader role as *providing support directly to other teachers for teaching and learning* in the classroom. They *did not*

describe leadership as a process. They did not see that leadership has specific strategies such as those of coaching and mentoring or concepts such as those promoted in the different theories of leadership, for example, transformational and distributed leadership. However, evidence of changes and shifts in their views over the time that the professional development programme took place can be seen under the following categories. The first shift that appeared in their thinking was the realisation of the difference between social and professional talk when working with colleagues.

4.2.3 Professional talk versus social talk as a key part of emerging leadership

In working with their colleagues in small professional learning communities, the emerging leaders identified that the coaching and mentoring skills they learned during the workshops helped them to *see* clearly *the difference between professional talk as part of the leadership role and social conversations* as with a friend. This distinction emerged over the course of workshops and during reflective group conversations at the start of each workshop. A comment from Rose clearly illustrates this point.

> It [reflective interviewing] is sort of a way to shift from your personal
> relationship with the people to your professional relationship
> because I get on quite personally well with the two people involved
> and it just makes that shift quite obvious. I am now stepping into
> this role rather than just chatting to you. (Rose/W2)

Daisy similarly found that although "there were a lot of negative things really I found this [active listening] was really good at helping me to not become involved in those things". She continued, "It helped me just to focus on what they were really saying" (Daisy/W3). Iris also confirmed the value of the distinction made in the coaching and mentoring workshop between professional and social talk, saying "I think that having tools like we've been practising using, it takes your person out of the equation and you become, more, more professional" (Iris/W3). Violet pointed out that the skills were particularly helpful in more difficult situations, explaining "a teacher came to me a little bit peeved about something and I just practiced my reflective [questioning] without her knowing." (Violet/W2). Reflective questioning has enabled the emerging leaders to take a step back, remove their personal attachment and identify the issue rather than the person.

In the final interview (code /If), after the completion of the workshops, the emerging leaders elaborated on the value of the professional conversation role. For Rose the skills helped them "to provide a pathway" into other teachers' thinking. Daisy and Iris commented on *deeper learning* in the sense that "the conversation was deeper, it brought out more about what they thought "(Daisy/If) and "they come when they want to discuss and get into the depth of it [the topic]". (Iris/If).

In summary, the data showed that the teachers valued learning about and using the coaching and mentoring skills, active listening and reflective interviewing (questioning). This enabled the emerging leaders to distinguish between professional and social conversations. It has eased a difficult conversation situation. It has enabled a more in-depth, deeper, discussion. This appears to have given them the opportunity of exploring options and feeling more in control of the situation, in their words, "a more professional approach" to the conversations. Additional data supporting this section can be found under section 4.4 in this chapter, which looks at the impact of the individual coaching skills on developing leadership.

4.2.4 Linking further leadership skills to coaching and mentoring skills

Over the course of the professional development programme all four emerging leaders began to grow in confidence. They began *to link their developing coaching and mentoring skills to those of developing leadership skills* such as taking responsibility to help other teachers to participate in their own learning, using listening, and identifying their own learning as well as establishing their own goals.

 (a) Links to identifying the responsibility to help other teachers develop

A new idea emerged from Rose. She now feels that she has a need to take responsibility to help *people take ownership* for finding out answers rather than just telling them.

> Yes, probably before if someone had an issue I'd probably sit there
> and listen to their issue and maybe agree with them, whereas now I
> am more likely to ask a question about how the issue arose and why
> and try and put them on the right track to find out. I feel like yes, I
> have a place or a responsibility to help somebody else rather than
> just agreeing with them. (Rose/W3)

Daisy, like Rose, no longer believed that she has to come up with all the answers.

I believed that I must jump in with the solution. Now I am like I might have a solution in my head but I'll go to the questions first and yeah, cause now I see how much more powerful it is rather just me telling what I think. (Daisy/W3)

Iris agreed with the others at the workshop 3 reflection session, but also pointed out that not giving the answer straight away can sometimes cause problems. She said, "But some people like the quick answer, you know. Can you just tell me? No, I can't because I don't believe that's the best way to go forward." (Iris/W3). She acknowledged that not providing the answer was a skilled activity.

(b) Links to the usefulness of coaching skills for a leader's role

All four indicated that they recognized that the coaching and mentoring skills are helpful in developing the skills to *support teachers* as part of their emerging leadership skills. Iris quoted that:

In this role [as an emerging leader] I lead meetings, facilitate PD (professional development), visit classes, support teaching and learning programmes and give feedback as well as communicating messages to and from senior management. You have to provide support for somebody else, and these [coaching and mentoring skills] give you the tools to provide that. We're going to be using them all the time. (Iris/W3)

In addition, Iris pointed out that "I think if you [as a leader] wanted to move a group of people forward then working in this coaching way would be a really strong way to do that." (Iris/If). Violet also sees leadership linked to coaching "I think I've linked it [coaching] quite closely with leadership, they might do observations, and feedback, or have discussions, dialogue, so that the other person can come up with their own input". (Violet/If)

(c) Links to growth in confidence as leaders

The emerging leaders acknowledged that their leadership skills and self confidence had grown through the use of the coaching and mentoring skills as a leadership strategy. The skills had given them more *confidence* to act as a leader.

Rose highlighted that she needs *to feel secure as a leader* and that the skills "provide me [with] security; it gives me something to sit down and think about and a way to set it out, so that I know where I am going. Yes, it's given me focus." She added "I'll happily run a team and I'll be ready for it when it comes now and I won't be so

worried about the thought of having to do it." (Rose/If). Daisy explains "you know it but it is just giving me the confidence to say well, this needs to happen," (Daisy/If) and Iris says how "I just feel... I'm alright I am not completely failing here... now I know what it's called, and now I know I am doing it and why I am doing it so that's great... it's [the coaching and mentoring skills] just made me feel like I am not a fake." (Iris/If). Rose similarly adds "as you become an experienced teacher you have to impart the knowledge or help them [new teachers] on their journey so yea and I just feel more confident about having the skills to do that." (Rose/If). In the final interview Violet showed greater confidence and a fuller understanding of leadership in stating that "I see myself playing more of a role in actually me *initiating something* I think, working with the group and having *a final outcome* like taking a project" (Violet/If).

The coaching skills have also helped Iris to provide a way to make her *leadership role clear to other colleagues*. She said that "when you have worked alongside them and then all of a sudden you're a leader, and you have to really make the distinction." (Iris/W3). These skills have helped Iris and her peers to clarify her role as a leader.

In addition, unsolicited anecdotal comments from other senior colleagues came when I visited the emerging leaders' schools. These comments suggested that the emerging leaders had increased their understanding and skills of leadership while in this research study. They were developing an appreciation of the bigger picture of leadership, such as their understanding of the theories of leadership and the reason why and how their senior managers organized or strategized systems in the school.

In summary, the comments made by the emerging leaders indicate that they have developed understandings, skills, security and confidence related to their leadership role as a consequence of their participation in the professional development programme and working with their colleagues. They distinguished between professional and social conversations. This allowed them to develop opportunities for deeper conversations. The emerging leaders realized that leadership involves supporting others to take ownership of solutions to problems and that a leader's confidence and skills can be built by using coaching and mentoring skills.

4.3   Emerging leaders as curriculum leaders

Setting the professional development in a science context honed the focus for the discussions that the emerging leaders had with their other colleagues in their small learning communities. It was expected that this would change their role from a general leader to that of a curriculum leader. This did not happen. The analysis of the data collected from the four emerging leaders showed that, although they appreciated commonalities and differences in both roles, they did not consider that they personally needed to have pedagogical content knowledge of science to be a science curriculum leader. The only part of a science curriculum leader's role that they all agreed was essential was that of science resource organisation. Under the category of emerging leaders as curriculum leaders the following areas are explored, curriculum leadership similarities and differences, and resources for science as an issue.

4.3.1   Curriculum leadership, similarities and differences with the generic leadership role

By the end of the coaching and mentoring workshops the four emerging leaders saw *similarities between an emerging leader role and a curriculum or science curriculum leader role.* Rose, Daisy, Iris and Violet in the initial interviews all expressed the view that there was *very little difference between these roles.* For instance, Violet said, "I would approach it [science leadership] in the same way as I see the leadership is run in our school. So the same sort of skills would be used in both." (Violet/I) Daisy thought more about the leader's role than specifically a science leader's role, she said that "I noticed I was able to stand back from, not becoming involved in what they were talking about but looking more at what their issues were. So I was thinking more about what I could do to support them than achieving what they want" (Daisy/If).

The emerging leaders could all identify the differences between a generic leadership role that they had and what should be required of a science curriculum leader as can be seen by the comments below.

All four participants agreed that a science curriculum leader should have good science curriculum knowledge.

Iris referred to the need to "maintain up-to-date knowledge of the content of the curriculum as well as current teaching and learning pedagogies, and supporting teachers in learning this." (Iris/I). She emphasized the provision of "practical support with planning, teaching and assessment strategies is vital to the role [of curriculum leadership]" (Iris/I). Daisy asserted, "they [science leaders] need to know what the big ideas are in science, and the concepts, the important concepts and how they link to other… but essentially it is also about that body of knowledge," (Daisy/I).

In the final interviews two of the emerging leaders commented that science leaders need to have a *passion for science.* Violet said, *"*I think you'd need a passion for science, I don't think you necessarily need to know everything about science" (Violet/If) while Rose explained, "I have a passion for art [so you need that for science] (Rose/If)".

Two of the four emerging leaders considered that in the case of science curriculum leadership it is often a matter of chance in finding someone who is keen on science in the staff or the teachers' team. This also provides opportunities for distributed leadership. Rose expressed this clearly in stating "I have no personal experience with science, whenever I do a science unit I have to get the book out and look through it, but again, we work as a team and so there has usually been someone else within the team that has carried that science part for the rest of us." (Rose/I). Violet supported this in saying "Yea, and if they (other teachers) might be able to hold PD staff meetings and like try and bubble up ideas [about science] in the school and stuff like that, sort of start initiate something that people can all get joined into and things like that." (Violet/I).

Daisy and Iris, in their schools, also did not have a teacher specifically designated in a formal way to be responsible for science curriculum per se. Although Iris mentioned that a curriculum leader

> needs to know where each of their team is at in learning and is able to provide the appropriate support to challenge them and take them to the next step. Support may include working alongside them, observing and giving feedback, and/or finding the right people for them to work with in partnerships or teams. (Iris/I)

In summary, all four emerging leaders saw the roles of curriculum leader and team leader as much the same. They agreed in theory that it was important for a science curriculum leader to have a good body of knowledge but they did not see this was essential as long as the person had a "passion" for science. They saw the key leader role as supporting teaching and learning as the science knowledge could be found elsewhere.

4.3.2 Resources for science as an issue

Resources and resource management was an issue connected specifically with the science context.

All four emerging leaders referred to the importance of having resources organized for science and two of the four had a specific role to *organize the science budget* and *resource purchase.* Iris emphasized that "I also think it is important to be able to locate quality resources (including equipment, people, text, etc.) and provide support in using them effectively to support classroom practice." (Iris /I). Violet agreed and said that "I think so it is what you need as a teacher if you don't have a great bank of stuff or knowledge you need to get it from somewhere and yea, fill up your own resources and things that you can try." (Violet/I).

In summary, in comparing the emerging leaders' responses to leadership versus curriculum leadership and science curriculum leadership in particular, the generic leadership role appeared the same to the participants. They did not see *science knowledge as essential for the leader to have when it came to leading in a science context.* In fact in all four schools there was no specific science curriculum leader. Two were delegated to look after the science budget and resources. While all four saw that it was important to have good science knowledge and skills as a science curriculum leader, they did not agree that it had to sit with them as leaders and saw that other teachers in the schools could be used as a resource when planning. All planned cooperatively. All talked about the importance of resource provision in science.

4.4 Coaching and mentoring as effective leadership skills

The purpose of this research study is to explore the effectiveness of the coaching and mentoring process in developing leadership skills and understandings in the four emerging leaders. This section explores the understandings that the participants have of the terms coaching and mentoring. It explores their coaching and mentoring skills development. It includes the findings about leadership that the emerging leaders developed through using coaching and mentoring skills.

4.4.1 Understandings of the terms coaching and mentoring

When asked in the initial questionnaire, whether they had used coaching or mentoring skills in their work at school, three of the four emerging leaders answered "No". The fourth linked coaching and mentoring to her professional support roles with other teachers. These responses confirmed *the difficulty in readily identifying what a coaching role is.* However, when asked in the initial interview what they understood by coaching and mentoring, their answers showed that they considered that they were in fact informally carrying out some coaching and mentoring skills as part of their daily practice. Two of the emerging leaders talked about questioning (Rose, Violet). Daisy and Iris both mentioned supporting others as being part of coaching and mentoring. Rose referred to "helping others to find things out for themselves" and Daisy spoke of negotiating learning as part of coaching.

At the final interviews, after the workshops, their views were clearer and more in-depth as can be seen in the following points. Firstly they made a *distinction between a coach and mentor.* As Rose pointed out, "you [as a coach] go on the journey with them, whereas a mentor to me would be someone that already has done the journey". A mentor was a person with knowledge and skills in the area of interest. Secondly, all the emerging leaders *identified specific skills and techniques* involved in coaching and mentoring. All four referred to active listening skills, reflective interviewing and the use of the questions. Daisy and Violet referred to setting goals. Iris and Violet mentioned the use of observations and feedback. Daisy also referred to the use of dialogue cards.

Interestingly all four emerging leaders indicated they *used coaching skills in their teaching*, particularly the use of questioning. Daisy talked about focusing on the children themselves coming up with the questions and said that

> It has made me also think more about in the classroom with the children, in the way I might [do] questioning about ideas, about trying to extend their thinking a little bit. Just in moving away from the teacher questioning thing, to more of a discussion. (Daisy/If)

Violet also saw the value of questioning to help children to come up with the answers themselves. She explained, "I would use those skills with the six year olds. Try to find out what's actually happened and then get them to come up with solutions." (Violet/If). Rose and Iris made similar comments.

In summary, the emerging leaders' knowledge of the terms coaching and mentoring and the skills involved grew as the professional development programme and their work in schools progressed. They developed a clearer understanding of the differences between coaching and mentoring. In addition they were able to use the skills with their colleagues and in the classroom with the children, to extend their learning.

4.4.2 Development of coaching skills and their contribution to leadership

During reflections on the first workshop the four emerging leaders discussed how they had met with the other teachers in their schools. (Each emerging leader was asked to work with two other teachers in their school). They all spoke of the importance of a *suitable venue/environment* for meeting and working with their teachers. In all cases using the coaching skills as part of the emerging leaders' development was considered *part of the participants' normal practice*. It supported their wish to focus specifically on building their leadership skills while exploring their school's teaching and learning of the science curriculum.

The following coaching and mentoring skills of active listening, reflective interviewing, goal setting and the aspect of trust, were highlighted by the four emerging teachers as the most useful skills that contributed to the growth of their leadership from the workshops.

(a)   Active listening

During the reflection sessions at the workshops (coded; W1, W2, W3, data gathered at workshops 2, 4 and 5) the emerging leaders spoke of "active listening" as a skill they used in developing their group or small learning community's understandings. They identified three clear outcomes of its use in developing leadership. Firstly that the teachers were encouraged to use *more professional talk* with each other, secondly, by allowing for self reflection, that the *conversation got deeper* into the topic and thirdly that active listening could also *be used with the children* to help with their learning. Section 4.2 in this chapter also supports these findings when looking at the emerging leaders' role.

All four commented on the positive effects of active listening skills on professional talk. Daisy commented on active listening and the way it promotes *professional talk* and the sharing of ideas in the following quote.

> I think active listening itself promotes that sharing because there is
> this pause and they feel like they have got to carry the conversation
> on. And you are not making a response every time they say
> something so you are giving them that opportunity to say more.
> (Daisy/W1)

Rose also added that after each session with her small learning community, active listening had become a very useful tool for professional talk. "I just gave them the question and they just kept talking and talking (Rose/W1). She confirmed at the final workshop reflection session "it has become a very useful tool. I hope that the more we use it and know about it the more it will become part of your everyday way you interact with other people." (Rose/W3). Rose commented on how interested she was in observing how the active listening skill worked. When "just listening" Violet was also surprised how much the teachers talked and what she personally learnt from the conversation. "I asked them, what do you feel the positives and negatives of science are in our school? So they had a really good conversation about that" (Violet/W1).

Iris particularly noticed that leaving time to think and reflect had helped teachers get *deeper into an idea,* "'Cause I suppose when you speak you speak about the things on the top of your head and then as you run out of things to say you get deeper, and deeper, and deeper. (Iris/W1)

Iris also identified the use of "wait time" and silence to extend the thinking and to allow others to participate "especially that attention taker, don't answer [them] straight away until the others are given that extra length in time" (Iris/W1). Violet confirms that given time with the group including staff meetings the listening time will enable people to come up with new ideas. "Yea and I just think in staff meetings and stuff to be able to help come up with a group stance in something you know, yea." (Violet/If).

Rose noticed the links to classroom practice and the importance of *giving time to listen* with the children. "Well even with the kids in the classroom, it really makes you stop and think am I actively listening to this child, or have I just asked a question and what's the right answer kind of thing." (Rose/W1). Daisy also talked about the use of the dialogue cards to enhance steps in a professional discussion and explained "the last time we spoke everybody was quite excited about what they were wanting to do and talking across each other so we used your cards." (Daisy/If). The cards made sure that everyone had the opportunity to be involved and their opinion heard.

The four identified the following as key points when asked the following question:

What do you think are some of the key ideas behind active listening?

- Not jumping in, giving time

- Allowing people to be self reflective

- To have a really good understanding of what they are talking about, what concerns them

- I found paraphrasing at the end quite useful just to check back that I did get the message

- Having the right safe environment and a safe relationship

Violet encapsulates the feeling that "it encourages people to be a bit more innovative as well if they feel that they can, got the power they can do whatever." (Violet/If).

In summary, active listening has been identified as a key skill for the emerging leaders. Conversations with their colleagues have benefitted from its use. The conversations became more focused, deeper and professional. The use of the skill

enabled colleagues to become more reflective and acknowledged that wait time assists this process. Active listening can also contribute to children's learning in the classroom.

(b)   Reflective interviewing

Reflective interviewing involves using questioning at three different levels. Simply put, level 1 is straightforward recall, the "how" "what". The second level is exploring the "why" and the third level the "so what" and incorporating the critical reflection stage. The four participants all used the reflective interviewing skill.

My findings showed that the emerging leaders all used this technique to further professional teacher talk, giving a deeper focused professional discussion within their small learning communities or group of teachers that they were working with. It assisted the emerging leaders in taking a leadership role in that they had a format to follow and did *prior preparation of questions* before their meeting which they had not thought of before.

Rose, Iris and Violet (Daisy was ill for this workshop session) all pointed out that it helped to give shape, forethought and planning for their meetings, it contributed to them taking a leader's role in making decisions. The questions resulted in *improved professional, focused teacher talk* and the *teachers' ownership of the solution* to their own questions.

Rose, Iris and Violet each commented on the use of the prior setting of questions in helping her take a leaders stance. Rose said "Yea, I made the decision for us [the learning community]" and adds, "so I gave it [reflective interviewing] some thought beforehand about what that might be. I chose questions that would sort of build on from what they did last time. (Rose/W2). Iris referred to the use of the level1 questions to stimulate her colleagues to think and contribute to the discussions

> I did the same …By the end of it, they are reflecting with each other
> and bouncing off from each other so that was a nice way to bring
> everybody in with just your level one questions at the start.
> (Iris/W2)

Violet pointed out that it enabled her to help her colleagues as a leader and to promote them to think and be more innovative. She emphasized that "I have been

helping other teachers but I've been in the past feeding them the answers, and now when I have those conversations it encourages people to be a bit more innovative"

Rose also commented on using reflective interviewing as part of everyday conversations "I find myself using it in conversations especially active listening and being aware and reflective questioning. It has become a very useful tool." (Rose/W3).

Iris and Violet also make the important point of *ownership of the solution* to the problem by the person asking the questions;

> I am very careful not to just say here's a way to fix it. I listen, then try, and frame a question back again. I feel like it's making more of a difference because the person doing the work is the person who is doing the thinking, it is likely to make a more long term difference to their practice than me just giving a quick fix. (Iris/If)

Violet adds as well that if they feel that they can solve the problem then they have "got the power they can do whatever". (Violet/If)

In summary, the use of reflective interviewing questions assisted in initiating, and improving the leader's role. It supported the emerging leaders in giving them a framework for taking leadership of their groups. Initiating prior preparation and thinking before meeting with their learning communities. It assisted in focusing professional teacher talk and new ideas. It enabled colleagues to identify how to take ownership of their own problems.

(c)   Goal setting

The goal setting skill promoted in the coaching workshop was that set out by Robertson (2005, p.133). This involves the use of the mnemonic GROW. GROW stands for Goal, Reality, Options, Wrap-up. The emerging leaders used this strategy with their colleagues and also with, in two cases, beginning teachers in their schools, as they knew that the experienced colleagues in their small learning communities had already identified their goals. Comment is made on this under limitations of the model in the next chapter.

The emerging leaders all found the framework of GROW helpful to use in their *goal setting discussions* with colleagues in supporting their leadership role. Again, as with

reflective interviewing, they did some prior preparation, to assist with the goal setting, which they would not have done previously.

Iris commented that she found it very helpful to have a framework to follow. "It was really good for setting our goals together and certainly it directs our discussion now, that's where our discussion goes, straight to the point." (Iris/W3). Iris also commented that the formality of her conversation frightened one of her new teachers. "I did tell my one what I was doing, using a model that I thought would be quite helpful to look at her goals, but I think it did scare her a little bit being quite formal." (Iris/W3). Rose when working with her beginning teacher also found it helpful to have a framework. She stated that "I had prepared quite a few questions. She led herself through it so I took that as an indication that my questions were reasonable because we got where I wanted to go." (Rose/W3). Violet and Daisy both added that they agreed with the above.

Three emerging leaders included how it could be used with appraisal. Violet's quote exemplifies this:

> I told her the purpose of it [GROW] was to provide a focus for observations, me observing her, and appraisal, and to come up with some new goals and a plan of action. (Violet/W3)

In summary, the use of the GROW model gave a purposeful framework for discussions, goal setting and stimulated ideas for the use of the model in appraisal meetings. It provided a tool for the emerging leaders to use in a leadership role.

(d)   Trust

Trust surfaced as an integral aspect of developing an effective coaching relationship from all four emerging leaders during their reflections on their practice at the workshop sessions.

All four emerging leaders agreed that it was a sign of trust if the person was prepared to talk about issues that were challenging, negative, or did not work out for them. This was identified when it was asked if any of them could make a comment on how they knew that trust was established in a relationship with their colleagues.

The following responses were made;

> "But I think the hints maybe that trust (inaudible) happen is that [they] weren't afraid to talk about the challenges. Not afraid to be honest and say I haven't really worked that out yet." (Violet)

> "Yes, I felt the trust was there because this person's negatives were to do with her role as the leader, and some of the difficulties she is having with developing." (Iris)

Two others commented that trust was not there yet.

> "I don't think that there is enough trust yet to have that aspect. I mean it would have been difficult to share the negatives that they may have experienced yet." (Rose)

> "Yea, and mine did say that and he was quite happy to mention challenges but not anything negative ..." (Daisy)

All the above are taken from reflections in workshop 3.

Daisy concluded at the final interview that trust is part of coaching and mentoring and stated "you trust them if they have that mentoring coaching aspect to their leadership as well as the knowledge and they're the people that are trusted and looked up to." (Daisy/If).

In summary for this section, the following four key findings have been highlighted. Firstly, the recognition of the importance of the coaching and mentoring skills, active listening, reflective interviewing (questioning) and goal setting through the GROW model, and how they contribute to leadership. Secondly, that with the use of these skills in the learning communities, the teachers' conversations became more focused, deeper and professional. Thirdly, the skills supported the emerging leaders in giving them a framework for taking leadership of their groups. The GROW model stimulated ideas for the use of the model in appraisal meetings. Fourthly, trust was identified as being present when colleagues shared experiences of unsuccessful practice. Trust was seen as a vital component to professional discussions and the development of learning.

4.5   Science as a context for leadership

The data gathered from the interviews and questionnaire showed that the following themes emerged in relation to setting science as a context.

- Promoted opportunities for professional teacher talk about science curriculum

- Explored the style of science learning

- Resources and planning

- Place of science in schools

4.5.1 Promoted opportunities for professional teacher talk about science curriculum

With the selection of science as a context for practicing the coaching and mentoring skills, an opportunity was created for *the discussion of science* within the small learning communities set up by the emerging leaders. Teacher comments indicated that, on the whole, discussing science specifically was not previously thought of but had been found to be of value. Discussion revolved around planning, key foci and reflection on their teaching of science. Daisy commented that "this has been a real sort of something we haven't thought of before. Focused on science, we got lots of ideas and things that they'd like to do". (Daisy/W3). Rose added "Just talked about science in our little meeting the other day was making sure [that] some of the science skills that we need to… to focus on in our planning." (Rose/W2). Iris also said that it gave them an opportunity to focus on science "they identified two things that they really wanted to work on". (Iris/W3). Similarly Violet said "I think I had a really good conversation with my critical friend group about science, and the teachers were very reflective about their own teaching". (Violet/W3).

All four talked about the *specific science comments* made by their colleagues. The main comments were about the importance of the big science ideas (key science concepts) in science, the practical hands-on nature of science, the manageability of science and how children love science. All comments were made during reflections at workshop 2.

Comments on *big ideas and manageability* are supported by these quotes

> Making sure that it [science learning] is completely relevant to the big understandings that we're trying to develop and also, doing it in a practical hands on, science is active, and that manageability of all of that. (Iris /W1)

Rose talked about teachers reflecting on "What's the science behind this, finding that's not always obvious, was it knowledge that I want the children to have." (Rose/W1).

Reference to the *hands-on nature of science* as a positive experience was made by Daisy who said "science, it's a hands on activity and it is very motivating for children," (Daisy/W1). Violet added that the children *love science* and are so motivated "the children are thoroughly engaged because you have got an opportunity to do all those experiments" (Violet/W1).

The practice of active listening with their colleagues in a science context provided an opportunity and structure for identifying issues and professional talking about science teaching and learning. In addition, the four emerging leaders themselves shared ideas from their schools at their professional development workshops.

4.5.2 Exploring the style of science learning

Out of the science context discussions there came an opportunity to explore the style of science teaching. All four commented that they did not just focus on science but on the teaching and learning as a whole. By the third and fourth meetings with their colleagues the conversation was on teaching and learning rather than on science teaching. This occurred because the science was no longer relevant to their day to day teaching as the teachers had moved on to focussing on another learning area. This can be seen in the third reflections (W3) and final interview (Tf) comments of the emerging leaders. This particular aspect of teaching style was identified by the emerging leaders. Violet took the lead and asked the question of her colleagues:

> The question that I asked is what style? Everybody had a different style and then yea, it was quite good to listen to other people's style because then it made you think… Yea so that was quite a reflective question. (Violet/W2)

The science context also prompted Iris's colleagues, in another school, to reflect on the style that they use for teaching as a whole rather than just science "so that it would reflect through, right through the whole of the classroom, rather than just the science activities itself….." (Iris/W2)

Rose referred specifically to style for science as investigations and the way that one teacher structured her science teaching. Rose then commented on how she took the lead with her colleagues exploring what made successful science teaching:

> We when we started to talk, we were talking about successful science, through the questions we tried to pull apart what we did and why we did it, so sort of looking at the beliefs about good science, beliefs about good science learning and teaching, which was really good because it led straight into goal setting, so we started to uncover what our science concepts are for the next unit of learning, (Rose/W2)

The generic topic of the style of teaching came up as a side issue arising from the emerging leaders' use of coaching and mentoring skills to promote thinking about the specific way in which the teachers approached their science teaching.

4.5.3 Resources and planning for science

During the emerging leaders' reflective interviewing with their colleagues it became apparent that they could build further on the conversation to assist their teachers to identify goals and the next steps for science teaching and planning. This I see as a *clear indication of emerging leadership.* All four worked on planning and this can be seen by further references made to planning under the goal setting in an earlier section on GROW under coaching and mentoring. Iris added, at the reflection session, that planning came out of the discussions about science "I believe that those two things that we identified so clearly will be there, planning and teaching, they'll be thinking about it." (Iris/W3).

Interwoven with thinking and actions around science planning was the identification of the need for resources. Resource provision, organizing and purchasing were often seen as blocks to science teaching. As Violet explains "what hindered their own teaching and with the school, were resources again." (Violet/W2). She spoke of building up a "resource bank of stuff for people to come and grab".

4.5.4 Place of science in schools

In three cases the focus on science faded out after the first three meetings of the emerging leaders' small learning communities, as the group felt that they needed to move onto another curriculum. The fourth school had a teacher with a science

degree in their group, this assisted in keeping the science focus going. This is referred to in detail under the learning communities section in this report.

However, having a science context did create an awareness of the place of science in the school. Daisy said that the research created an awareness of the lack of time given to science curriculum delivery in their school when compared with some other curriculum areas. One emerging leader's senior manager commented "that if somebody came to me and said my son's really passionate about science and how are you catering for him, it would be difficult to answer" (Daisy/W3). A similar point about time given to science was made by Violet, "but because the science buzz is sort of over with at the moment, with another buzz going but it might come back to it," (Violet/W3).

Science is often seen as supporting and fitting into other main learning themes that are being promoted in the school. Rose related it to the teaching and learning strategies rather than the science knowledge base "I think it is more an impact on actual learning and teaching itself and the way you interact with other people. I wouldn't say it's science, it is in everything we do." (Rose/W3). Daisy pointed out that in their school "[the] big thing this year is engagement, and that there will be lots of hands-on activities and making and doing, so therefore the children will be a lot more engaged and actively involved." (Daisy/W3). She related the hands-on of science to the engagement in learning theme at their school.

In summary, the science context plus the coaching and mentoring skills assisted the emerging leaders in their leadership development. It promoted reflective discussions and highlighted some key aspects about science teaching, styles of teaching and the place and time given to science curriculum delivery in the four schools. It alerted them to issues concerned with resource provision.

4.6 Professional learning communities as a vehicle for developing leadership skills

The emerging leaders used their newly learnt coaching and mentoring skills to assist in the leadership and growth of a learning community. The data presented earlier under active listening, reflective interviewing and opportunities for professional teacher talk about the science curriculum included rich descriptions and indicators of a growing learning community around the coaching and mentoring used by the four emerging leaders.

Here the following areas pertinent to professional learning communities are discussed; science context as a focus, learning communities as a vehicle for developing leadership and the sustainability of the learning community.

4.6.1 Context as a focus

The science context as identified by the researcher was one that met the needs of some primary schools. All four schools involved agreed to the science context as being a need for their school. The context was identified to promote use of the science curriculum and to encourage teacher talk and learning in a science context. A specific contextual focus (in this case science) is essential to a learning community. The four emerging leaders agreed that it was helpful at the start *to have a clear context* for their professional conversations and that it met a need also identified by their schools. Daisy explained "for me having not been in a leadership role before, it helped me to just start with the science" (Daisy/W2). Rose agreed on reflection that it was good to start with because "having that science to hang it on at the start gave us a place to start, I still think you had to have it there," (Rose /W3). Iris added that it was essential "just to be really deliberate about what it is that we want to get." (Iris/If). Violet pointed out that you need to have a focus to make learning happen "Yea, well that wouldn't have happened if I hadn't been talking about science… Open a box there's always something comes out of it." (Violet/If).

When the four emerging leaders as part of the reflection session at the last workshop were asked about their work with the additional teachers who formed the learning community, it became apparent that the *focus for science had lessened*, but the focus of the learning community remained on teaching and learning.

In their replies Rose and Violet identified issues in continuing with a science context, they had finished their planning and were then moving on to another curriculum area. Iris highlighted difficulty in finding the time needed to meet so had used email communications. Daisy, however, highlighted that "we seem to be developing in our school we haven't experienced it before, a real culture of professional discussions around things" (Daisy/W3).

The context provided an essential starting place even though its prominence lessened over time.

4.6.2 The learning community as a vehicle for developing leadership skills

All four referred to the *usefulness of their learning community* in developing their leadership skills. Daisy highlighted the use of active listening as a leadership skill "but it was a really practical situation where there was so much to say and once they started to see that to stop and listen or to add on to somebody else's idea, instead of talking" (Daisy/If). Iris added that leadership is a cooperative process as "it doesn't imply telling, it implies facilitating, so it is a process of developing together "(Iris/If). Violet confirmed the effective use of the skills in the learning community, "definitely the skills are probably one of the most powerful things I have been given, I think I'll use them a lot," (Violet/If). Iris referred to the use of reflective interviewing and questioning in her learning community, "I am applying the context of coaching to all of the conversations, the professional conversations that I have with my team." (Iris /If). Iris also confirmed the effect other coaching and mentoring skills such as descriptive, non-evaluative feedback as having impact of on her leadership role. "I am also very conscious of not giving judgmental kind of feedback so I think it is going to be really, really useful in everything that I do." (Iris/If). Violet talks about the use of reflection "so they are reflecting what they do and listening to other people what they do and picking what they think they might be able to take on board." (Violet/If).

In summary, the learning communities provided an opportunity for the skills of coaching and mentoring, learnt during the workshops, to be used with their school colleagues. This in turn has had a positive impact on developing skills for their emerging leader's role.

4.6.3 Sustainability of community

The emerging leaders all referred to the future. Three emerging leaders could see their learning communities continuing but only one emerging leader could see the learning community continuing specifically in science. As mentioned above this group included a teacher with a science specialist qualification.

They looked at using their learning communities, in the future, in a variety of ways. Daisy and Iris looked at peer support, "where if I want to do something in my classroom then …, we could give each other feedback about what we're doing and how we're going. (Daisy/If). Iris was hoping to use the descriptive feedback as part of peer evaluation inside her learning community.

> I think that would possibly be the next step, and just in discussions
> with others even if it is just little bits of observation that I've done I am
> just being very careful with the judgment free reflection I don't think
> I'll ever stop now. (Iris/If)

Daisy looked at transferring the model to another curriculum area, "I don't see why it couldn't especially if you have got an interested group of people" (Daisy/If).

Violet said that their group would plan for science again after a break, "Yea we'll start at the beginning of the year and decide with the school what big science topics we wanted to teach throughout the year "(Violet/If).

Rose commented on how she would use skills in the future but she found the context too artificial in the way it was set up and felt the context must be *authentic.* "No probably not, they only met with me because I asked them to," (Rose/If)

The current small learning communities have the opportunity to continue in the future. Only one emerging leader indicated definitely that she would continue with a science context. The leadership skills learnt will be used in either their current learning communities or in new ones. It is important for learning communities to be based on an authentic context.

In summary, the learning communities provided a positive opportunity for the development of leadership skills through the process of coaching and mentoring, in their professional learning communities. Their emerging leadership skills and

knowledge grew. The context provided an essential starting place and focus for the learning communities.

4.7   Professional development model supported

The four emerging leaders made comments on the professional development model that underpinned the workshops.

4.7.1 Support for the model

They found the overall structure of the model workable. In particular the four emerging leaders found the use of the reflection discussion sessions held at the start of each workshop informative. These sessions stimulated new ideas and gave an opportunity for sharing and exploring the use of skills learnt. The new ideas came from their sharing the progress, findings and changes that they had observed in both their practice and the overall interactions within the learning community. This sharing was enhanced by the questions posed by myself as the researcher and the provider of the professional development programme. The introduction of the new leadership strategies, through the coaching and mentoring skills mixed with some leadership theory, provided opportunities to improve their leadership skills and knowledge. Implicit in the model was the time built in to try out new ideas between workshops with their small learning communities. Time appeared to be an issue for some, both in the length of time that the programme ran, which was perceived as being too short, and the emerging leaders finding the time within a school day to meet with their learning communities.

These findings showed that the coaching and mentoring skills, theory, practice and feed-back sessions provided through the professional learning programme, were effective in growing leadership skills and knowledge.

4.7.2 Future use of skills from the model

When asked the question, *do you see yourself in the future using the learning from this professional development in your role as an emerging leader?*
All four replied that they did. Iris and Rose added that the learning was *immediately applicable*:

> Things that I could take right now and use right now and because I
> did *apply it straight away* and I was thinking about it straight away ...
> then I would say to make it part of my regular practice. (Iris/If)

Rose added "now whenever it is appropriate you can actually use it (questioning) with the children in the classroom" (Rose/If). Daisy and Violet highlighted particular strategies. Daisy said that "I use the little *activities* when we are having our discussions and listening to each other" (Daisy/If). Violet "found watching the DVDs really valuable, so that *modelling* actually really helped me" (Violet/If). Many other comments that support this section have been made in earlier sections of this chapter. The four were then asked if there were any changes or recommendations that they would make to the model. The main change suggested was the timeframe. Daisy felt that "it could have been over a longer period of *time*" (Daisy /If). However, Iris felt that an extension of time could be a disadvantage "I think that sometimes when you have more time you lose the momentum" (Iris/If). The other two emerging leaders felt that the time was suitable.

Iris would have liked more time so that hard evidence from her colleagues could have supported her feelings that her work was effective when using some of the coaching and mentoring skills. "I felt like I needed to be finding some evidence, something to really hook into to know that what I was doing was making a difference"(Iris/If). Rose referred to the structure of the first session which did not give her a clear message about the purpose of the programme. However, by the second workshop she was able to see the purpose:

> The first session I thought oh, what are we actually doing, it didn't
> seem to be enough the first one. But as soon as I had been to the
> second one, I came out of there. (Rose/If)

In summary, the four participants found that the professional development model proved highly relevant and useful. They used strategies and ideas from the programme directly with their learning communities. Time was an issue, in different ways, for two of the four participants.

Summary

To summarise, initially all four emerging leaders did not distinguish between the terms leader and leadership. After the professional development programme the

emerging leaders grew in their understandings, skills, security and confidence related to their leadership role. The emerging leaders realized the importance of the coaching and mentoring skills, active listening, reflective interviewing (questioning) and goal setting to developing their leadership skills. The coaching and mentoring skills provided tools and a framework for improving their leadership skills. A key strategy recognized by the emerging leaders was the ability to empower colleagues to solve their own problems, through reflective interviewing. The teachers' conversations became more focused, deeper and professional and they acknowledged that fulfilling professional talk only occurs when there is trust. Trust was identified as being present when colleagues shared experiences of unsuccessful practice. The science context provided a focus and promoted reflective discussions and highlighted some key aspects about science teaching. While all four saw that it was important to have good science knowledge and skills as a science curriculum leader, they did not agree that they had to have the science knowledge themselves to be a curriculum leader. They saw that they could get this from other teachers in their school. All talked about the impact of resource provision in science.

The learning communities that they established provided a positive opportunity for the practice of the emerging leadership role and skill development. The professional development model was effective as a framework for the professional development programme. The coaching and mentoring programme effectively contributed to the growth of the emerging leaders' leadership skills.

The significance and support for these findings by other researchers along with the limitations of this research and recommendations for future research will be discussed in the next chapter.

Chapter Five: Discussion, recommendations and conclusion

Introduction

This thesis has attempted to explore how effective the use of coaching and mentoring is as a professional development process for primary school emerging leaders, using a science context. A number of key themes and aspects emerge from the findings that contribute to answering this question.

This chapter provides a discussion of these findings and then moves on to set out the implications of the findings, the limitations of this study and the recommendations for further study.

Discussion of the findings

In this section the answer to the research question is organized under overarching themes. The two overarching themes are leadership understandings and the growth of leadership practice in professional learning communities.

The findings show that as a consequence of participating in a coaching and mentoring professional development programme, the emerging leaders make changes in their own practice and this also influences that of their colleagues.

5.1   The first overarching theme: Leadership understandings

The positive effect of the emerging leaders being involved in the professional development programme focussed on coaching and mentoring as part of this research study is shown by the change in their leadership understandings.

This change includes growth in their theoretical understandings about leadership, their perceptions of leadership and the progressive growth in the emerging leaders seeing themselves as leaders. Importantly the emerging leaders are now able to identify the use of coaching and mentoring skills, in particular active listening, reflective interviewing (questioning) and goal setting as key leadership skills.

5.1.1 Changes in leadership understandings

The findings indicate that after the professional development programme the emerging leaders demonstrated a distinct positive shift in their understanding of leadership. The emerging leaders at the start of the professional development programme stated that they knew only about leadership from single role models. They made no clear distinction between leaders and leadership in their interview comments. This in part was likely due to lack of exposure to leadership theory. Their views on the leader's skills and role initially were fairly unsophisticated. They saw leaders as needing to have personal knowledge, communication skills, effective people skills, and being able to organize the provision of resources along with providing a supportive and high trust environment. Their initial views on leaders' skills partially meet the leader's role and skills requirements mentioned by Fullan (2001) in that he concurs that knowledge creation and sharing, plus relationship building which contributes to a culture of care, are key factors in a leader's role. Robinson (2007) in looking at differences between high and low performing schools pinpoints strategic resourcing as part of a successful leader's role, which also aligns with the emerging leaders' initial view of a leader's role as a manager of resources.

After the emerging leaders had been engaged in the five workshops their views of leadership were enhanced. From the data gathered it can be seen that they included acknowledgement and some understandings of different theories and strategies of leadership, and the effect of school culture. They were able to talk about the type of leadership in their schools. This shift in the emerging leaders' views of leadership aligns to a more distributive view of leadership as propounded in the workshops and supported by Marzano, Waters and Mc Nulty (2005), who emphasize that an effective learning and leadership culture is "one of nurturing and developing relationships with all staff rather than working with a few high level managers". This certainly supports the view by Spillane (2000) who talks about distributed leadership as a form of collective agency incorporating the activities of many individuals in a school who work at mobilizing and guiding other teachers in the process of instructional change. This shift is in line with the views of Timperley (2006) and Barnett and Aagaard (2007) that leadership cannot be left to the leader alone. This knowledge of different types of leadership assists in helping the emerging leaders to reflect on their own role as

leaders as they now have theories and more models that they can compare with and use to inform their own practice. After the workshops, the emerging leaders also added complexity and the importance of culture and leadership strategies to the role of a leader. The identification of strategies and the complexity of leadership indicated that their views on leadership had become more sophisticated.

My findings highlight that emerging leaders do not always perceive, in the first instance, *themselves as leaders.* After the coaching and mentoring professional learning they came to acknowledge that they could be leaders and contribute ideas to the big picture of the school leadership. The emerging leaders "not seeing themselves as leaders" is consistent with research by Robertson and Strachan (2001). Their research found, as I did, that teachers often refer to leadership as a role that principals and senior managers carry out, rather than seeing leadership as an action in which all can be involved.

The emerging leaders all saw their middle leadership role as *providing support directly to other teachers for teaching and learning* in the classroom. Support in the form of developing resources, planning together, suggesting different strategies and ideas for classroom teaching and learning to meet the students' needs and outcomes. The value of these activities is supported by Robinson (2007) who says that

> the closer the leadership gets to the core business of teaching and learning the more impact leaders have on valued student outcomes. School leaders who build relationships with staff through a collaborative and tight focus on teacher and student learning can make a powerful difference to their students. (Robertson, 2007)

One of the emerging leaders did not see teaching and learning support as a senior manager's role, which conflicts with the current New Zealand emphasis on principals of schools also being leaders of learning and curriculum. The increasing importance of an emerging leader's role in current schooling is confirmed by Hadfield (2005). He talks about the growing number of new middle leadership roles in schools both in the U.K. and internationally. He adds to this the increased opportunities offered for teachers to pick up this role, as a reflection on the changing nature of leadership, in that principals are promoting more delegation. This growing need for a number of

middle leadership roles is also true in New Zealand where we have evidenced based learning being driven by data analysis with many new initiatives, such as numeracy, literacy, physical activity, education for sustainability, all requiring implementation and leadership. All this increases the number of opportunities for the emerging leader role (Ministry of Education, 2007). In the four schools that the research participants came from there was evidence of many informal leadership roles. The emerging leaders talked about the roles that they have. Between them they held a number of middle leadership roles, such as tutor teacher, responsibility for the science resource budget, coordinator of one of the new curriculum competencies (thinking) coordinator for a year level and lead teacher for numeracy.

The emerging leaders, through the professional development workshops on coaching and mentoring skills, progressed in their confidence saying that the coaching and mentoring skills helped them "to provide a pathway" for the other teachers' thinking. This use of coaching and mentoring in providing new leadership learning is confirmed by Robertson (2005) and Lambert (2003) who refer specifically to the use of coaching and mentoring skills to move people out of their comfort zones if new leadership learning is to take place.

5.1.2 Coaching and mentoring skills assist in growing emerging leaders' practice

The role of the coach and mentor is essentially that of a change agent, this is an essential aspect of the emerging leader's role. In this role the development of confidence is crucial (Ackerman, Ventimiglia and Juchniewicz, 2002). The findings show that the most useful coaching and mentoring skills to build confidence and promote a culture of reflection and effective learning dialogue are active listening, reflection, reflective interviewing (questioning) and goal setting.

The first step in the changes in the emerging leaders' practice was seen as a willingness by the emerging leaders to be involved in some of the key aspects of change. They showed this by having a desire and commitment to develop professionally, volunteering to be involved, readily attending workshops in their own time, having ownership of the professional development programme content, in that workshops were constructed from their feedback, viewing change as a challenge rather than a problem.

The above changes all link closely to the nature of the change process described by Bell and Baker (1997, p. 260). As indicated in Bell and Baker's process of change the participants felt confident about making the changes and were prepared to take risks. The emerging leaders, as noted by Fullan (2001), also identified times when their confidence dipped but found that with the use of the coaching skills there was a process that when used helped them through this period of doubt. My findings show that the emerging leaders found the following coaching and mentoring skills the most useful in developing their leadership practice.

Active listening

The emerging leaders and others in the learning communities found initially that it was difficult to use active listening precisely. This is a finding also confirmed by Robertson (2005, p.110) "to listen for even three or four minutes without interrupting is something that leaders often find difficult". The data, however, show that the emerging leaders' practice benefitted from practicing active listening as their *conversations became more focused, deeper and professional.* The use of the skill enabled their colleagues to *become more reflective* and they acknowledged that wait time assists this process. Further discussion on these points will be commented on in the next section under learning communities.

The emerging leaders all commented on how active listening helped to grow their own *confidence* in leadership as it gave them a tool to use and a format to follow. Robertson (2005) confirms that "leaders also talk about the effect that this one small skill development has on their everyday work", they find themselves "listening first in order to learn" (Robertson, 2005 citing Covey). Ackerman et al. (2002) highlights the importance of listening as a coaching skill that promotes a "sense of self within us".

The emerging leaders significantly identified that active listening *contributes to their children's learning* in the classroom.

Reflective interviewing (questioning)

The findings from this study show that a focus on the use of reflective interviewing questions assists in helping the emerging leaders in initiating, focusing and *improving professional teacher talk and new ideas.* It helps their colleagues in identifying how to

take *ownership of their own problems*. Robertson (2005, p. 119) refers to this by saying that "the approach is more powerful than telling or giving advice because it is empowering". Ackerman et al. (2002) echo these findings in looking at the importance of skills such as questioning, reflecting and co-constructing knowledge in forming part of a coach's [and emerging leaders'] role. Hughes (2004) reinforces that coaching is about learning and talks about coaches being "primarily pullers not pushers". This reflective questioning skill is also a key part of action research which enables teachers to ask critical questions about their practice and to undertake systematic means of inquiry in order to understand or improve their practice (Stoll, Fink & Earl, 2003). The emerging leaders all found that the reflective interviewing skill supported them in giving them a *structure for initiating dialogue* and their leadership role in the learning communities. Lambert (2003) gives supportive evidence for the use of reflective interviewing in her continuum of emerging teacher leadership (p.103) in referring to reflective interviewing as an indicator of leadership. She says that firstly in adult development to evoke reflection in others "supporting a culture of self reflection" grows leadership and secondly to promote effective dialogue among members of the school community "by asking provocative questions" is a key leadership skill.

Goal setting

My findings show that the use of the GROW (Grow Reality Options Wrap up, Robertson, 2005, p.101) model for goal setting provides a purposeful framework for discussions, and stimulates ideas for the use of the model in other settings such as appraisal meetings. It provides a tool for the emerging leaders to use in a leadership role. Goal setting is a key aspect of action planning, it is used by leaders and classroom teachers in highlighting priority focus areas for future planning and improvement for learning. Robertson (2005, p. 132) confirms the emerging leaders' findings and emphasizes that "goal setting enables leaders to look ahead and determine desired outcomes". She concurs with their findings on the use of the GROW model as a framework saying that it "provides a particularly useful means of structuring a coaching session around goal setting". The emerging leaders found GROW especially useful as a tool when working with new beginning teachers in their schools as well as determining directions for science teaching with their colleagues in

the small learning communities. The emerging leaders also reflected on the use of GROW as a model for reflection at appraisal meetings where teachers are asked to identify future goals for their own professional learning growth. The emerging leaders used GROW to help the teachers monitor their own progress towards the goals.

Other coaching and mentoring skills were examined in the workshops. The skills of descriptive feedback and evaluative feedback (Robertson, 2005, p.140) were discussed at the final workshop but due to lack of time and the emerging leaders' reluctance to evaluate their own colleagues, these skills did not form the main part of their reflective discussions. They did, however, say that they could see the usefulness of the skills especially in giving feedback on their beginning teachers' practice. The importance of trust and further comments on reflection will be highlighted in the next section.

In summary the change in leadership understandings by the emerging leaders is seen through the growth in their discussions about leadership theory, their changing perceptions of leadership and their acknowledgment of themselves as having a leadership role. This emerging leaders' role is enhanced further through the practice and knowledge of coaching and mentoring skills.

5.2   The second overarching theme: The growth of leadership practices in professional learning communities

This overarching theme refers to the changes in leadership practices. The growth in leadership practices is supported in several ways. Firstly, the professional learning community provides a vehicle for the developing leadership skills. Trust is recognised as an integral part of building the professional learning community. Secondly, action research within the learning community provides an opportunity for reflection on practice along with collaboration and the identification of context as a common focus and goal. Thirdly, professional talk develops and grows as a result of the coaching and mentoring process. This involves promoting deeper professional talk again leading on to reflection on practice, enabling the personal emotional removal of the emerging leaders out of the conversations, so that they felt less threatened if they do not know the answer, or their idea was criticized. The emerging leaders were able to turn social conversations into more formal professional talk. Fourthly, growth of

leadership was also heard in the discussions on the effects of using science as a context and in discussions on the role of the science curriculum leader.

My findings from the emerging leaders' data, therefore, showed that this over arching theme fell into four main themes: first, building the professional learning community provides a vehicle for the developing leadership skills. Second, action research provides an opportunity for reflection on practice. Third, professional talk develops and grows as a result of the coaching and mentoring process and fourth, the effects of using science as a context.

The following discussions on the above themes show that the findings again support the research question in that coaching and mentoring skills assist the emerging leaders in their leadership practice development. This in turn assists in shaping the learning communities into effective professional discussion groups. The discussions also show that having a specific context helps to focus learning in a particular direction.

5.2.1 Building professional learning communities provides a vehicle for the developing leadership skills

A learning community is defined as "a group of people who take an active, reflective, collaborative, learning-orientated approach to the mysteries, problems and perplexities of teaching and learning" (Stoll, Fink and Earl, 2003 p. 132). This is the understanding that the emerging leaders took for their own communities. The qualities that promoted teacher learning were clearly identified as those qualities which linked to Timperley's views, where support is given to participants to process new understandings and the implications of those new understandings to teaching. Timperley (2006) and Stoll and Hord (2005) hold the view that effective learning communities require a supportive high trust environment, vision and values along with feedback and a strong link to improvement in student outcomes. In addition the use of action research fits with the learning communities as it encourages leaders to take time and reflect on their proposed actions. In this research communities formed at two levels, one within the school and secondly the small community formed by the emerging leaders themselves.

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The emerging leaders identified trust, in particular, as a key component to growing an effective learning community.

Recognizing trust as an integral part of a professional learning community

My findings from the emerging leaders confirmed that a trust relationship is an essential part of leadership in the establishment of a new learning community. Lunn (2006) verifies this in her research when teachers identified that "open communication, collaboration and trust were important parts of the workplace and the way they worked". Harris (2004) adds to this, saying that at the core of capacity building is distributed leadership along with social cohesion and trust. Hopkins-Thompson (2000), Allen and Poteet (1999) and Barnett (1995) all identify trust as a key component which enables effective professional support and learning to occur, particularly in identifying the teachers' real needs. Key factors here are the amount of time and contact that is needed to develop trust. The emerging leaders presented a very interesting perspective on how you know that you have trust when talking with colleagues. They all said that trust is there when a person is prepared to talk openly about the negatives and some of the difficulties that they are having with their practice. Robinson (2007, p. 20) touches on this aspect when examining how relational trust works in schools. She says that "relational trust involves a willingness to be vulnerable to another party".

5.2.2   Action research provides an opportunity for reflection, collaboration and focus.

Reflection

Reflection is a key aspect of action research (Cardno, 2003) and its value is highlighted in this study. The key skills of coaching and mentoring, such as questioning, listening, evaluative feedback and in particular goal setting as described earlier, all contribute to reflection as part of the action research process. During this study the participants were asked to reflect both with their colleagues and as part of the group of four emerging leaders as they moved through each part of the action research cycle. This reflection on practice which was assisted by the participants keeping personal journals was then used to plan the next stage in working with their

colleagues, as well as informing the professional development programme workshops. Lambert (2003) gives support to this in the following quotes

> " a learning community develops and supports a culture of self reflection that may include collaborative planning, peer coaching, action research and reflective writing, facilitates effective dialogue among members of the school community, facilitates communication among colleagues by asking provocative questions that lead to productive dialogue, promotes collaborative decision making, engages colleagues in activities that develop mutual trust" (Lambert. 2003, p. 98).

My findings from the emerging leaders' conversations at the reflection sessions of the professional development workshops clearly showed that it was important to set aside time for this. The emerging leaders reflected on how the learning communities were progressing. They were able to identify the new learning and provide feed-back on how this had built confidence in their leadership skills. They also could then identify the next steps that were to be taken. The emerging leaders used their personal learning journals to support their reflections. Robertson (2005) confirms the importance of reflection on practice as being an essential quality of leadership and one that needs to be embedded in the organization. She adds that reflection that leads to agency rarely occurs naturally in a leader's practice as they find it difficult to set aside time. Lambert (2003, p. 27) confirms how reflection on practice enables "new knowledge to be woven into a teacher's work" while assisting the development of leadership skills.

Collaboration as a key factor in building emerging leaders' skills

Collaboration played a marked role in the building of the learning communities. Cohen et al. (2000, p.227) quote Kemis and McTaggart who state that "the approach is only action research when it is collaborative, though it is important to realize that the action research of the group is achieved through the critically examined action of individual group members into their own practice". Action research is research by the teachers on their own work and is seen as part of their regular work, not as an add-on but it is not necessarily the usual thinking that teachers do when they think about their teaching, it is more systematic and collaborative in collecting evidence on which to base rigorous group reflection. It is not simply problem solving, action research involves problem posing and is motivated by the quest to improve the work that they do.

The principals, emerging leaders and teacher colleagues all collaborated to enable these small learning communities to be set up. Without collegial collaboration the emerging leaders would not have had the opportunities to practice their skills or their colleagues the opportunity to share their ideas. This in turn is expected to lead to improved outcomes for students.

The importance of a context in providing a common focus and goals

As well as being part of action research as a clearly identified common focus on science as a context, this is also an essential component of a professional learning community. In my findings all four emerging leaders agreed that it was helpful at the start *to have a clear context* for their professional conversations and that this context met a need also identified by their schools. Stoll (2005) supports this viewpoint and highlights the necessity of having a shared vision and values in a learning community along with a common focus. In this case, the context of science initiated the formation of the small professional learning communities and the principals' interest in this research. It gave the emerging leaders a common focus to start discussions. This then led into other directions, such as teaching and learning styles, a focus on resource provision and some thoughts about learning communities for other curriculum contexts. This therefore provides evidence that the use of coaching and mentoring skills plus an identified context is useful in promoting the growth of learning communities. Timperley et al., (2007) point out that "teacher talk and the outcomes of a learning community are unsuccessful unless there is a clear focus to improve student outcomes and new understandings".

5.2.3 Professional talk develops and grows as a result of the coaching and mentoring process

A key to effective learning communities is the generation of effective professional teacher talk which assists in identifying further goals, issues and greater understandings about teaching and learning for the teachers involved.

Teaching practices significantly improve student learning, if teachers reflect on and enquire into the effectiveness of their existing practices and implement alternatives that improve student learning (Annan, Lai and Robinson, 2003). This also forms an important part of the role of a coach (emerging leader) when working with teachers.

This is supported by Sutton (2005) quoting Stein and Spillane (2003) that interactive theories of learning start with the premise that "learning is something that happens between people when they engage in common activities." As individuals exchange views, listen to and critique others' contributions and expose their own beliefs and assumptions, they create a shared new understanding.

My findings show that the teachers in the learning communities through the use of coaching and mentoring skills (referred to earlier in this chapter) took time to have rigorous dialogue about teaching and learning and directions for their science teaching. The tools of coaching and mentoring enabled the teachers to have a more focussed professional talk rather than a social chat. They explored how they taught science and explored the differences in teaching style. They recognised that the different levels of questioning and active listening along with reflection were important tools in clarifying and structuring thoughts, ideas about teaching and learning. The teachers and the emerging leaders expressed that they got a lot deeper into learning. This is backed by the findings of West-Burnham (2005) who talks about deeper learning being double loop learning which involves links being made between idea and theory, integrating what you know and how you learn. It is an indicator of higher quality teacher talk and can act as an indicator of professional practice discussions. In my experience, it is also important to have clear protocols in place to provide all the learning community members with the opportunity to participate in teacher talk and to alleviate the issue of one speaker dominating the discussion.

5.2.4 The effects of using a science context

I set this research within a science context as the emerging leaders needed a context to start their learning communities but also science is often a poor relative in primary schools (Chapter 1). This is confirmed by one of the emerging leaders who said that they had "not thought of having a science focused learning community before". My findings showed that that the science context promoted opportunities for professional teacher talk about the science curriculum, raised discussions on the style of science learning, developed further planning for science learning and the exploring of resources for science. The science context also led to the role of the science curriculum leader being highlighted and debated.

These findings are consistent with Bell's (2005) review of learning in science. She argues that teacher professional development in science has two key elements, one is the input of new theoretical ideas and new teaching suggestions, the second is trying out and evaluating these ideas over an extended period of time in a collaborative situation, where the teachers are able to receive support and feedback, critically reflect and negotiate and reconstruct what it means to be a teacher of science. The data from teacher commentary indicate that the emerging leaders were able to carry out part of the teacher development promoted by Bell. They identified the importance of using *the big ideas in science* as a key factor, relating this to the body of knowledge that is science. This use of big ideas is also confirmed by Fletcher and Bell (1999) and Bell (2005). Interestingly, from the science teaching discussions held by the participants, there emerged the identification of the *style of teaching that is pertinent to science.* This referred to the use of hands-on investigative processes, and in one case the discussion referred to the use of a structured scientific format to the lesson, identifying hypothesis, method, result and conclusion. In all cases the use of science as a context always included the use of resources in science teaching and learning. The emerging leaders all commented on how children love science and felt that this came from the hands-on approach and the curiosity awareness that goes with science learning.

The science context led to the learning community looking at and revising their planning for science programmes in the schools. The emerging leaders confirmed that as a result of the opportunity to highlight science in their learning communities that all four schools now have science plans in place for this year and are starting to think of next year. The use of the reflective interview questions helped them to identify key goals for their science planning. The emerging leaders all worked in a collegial way, this is the usual practice in primary schools (McGee, 2001).

All four referred to the importance of having resources organized for science and two of the four had a specific role to *organize the science budget* and *resource purchase.* The practical hands-on nature of science and the manageability of science resources were raised as a concern by three of the emerging leaders. Fletcher and Bell (1999) and Harlen and Qualter (2004) agree that primary science is demanding of resources. In Fletcher and Bell's graph which looks at what subject leaders think they

should do, the organization of resources is ranked first. However, the effectiveness of resources in learning is ranked second to bottom. This was also apparent in the emerging leaders' comments on the role of the science curriculum leader.

The role of the science curriculum leader

None of the emerging leaders saw themselves specifically as science curriculum leaders. All four commented that they did not just focus on science but on teaching and learning as a whole. By the third and fourth meetings with their additional teachers the conversation was on teaching and learning rather than on science teaching. They did not feel that they personally had sufficient specific science knowledge. This is not surprising as primary teachers teach across eight learning areas in the New Zealand Curriculum and, as Hewson (2007) says, "teacher professional development in science is itself inherently complex consisting of a number of interrelated components". Science planning and learning ideas were generated by the group of teachers who formed the professional learning community. They all contributed ideas for science teaching. Some teachers who identified themselves as having a passion for science took on the bulk of the planning and generation of ideas. In one school a member of the group had a science degree. The allocation of teachers, by senior management, to take charge of the science budget, is not linked to their science curriculum expertise. Only one learning community has continued with a science focus. This is the community which contains the teacher who has a formal science qualification. In this school also a review has been carried out on the place of science in the whole school curriculum delivery, a task not carried out in the other three schools. The review is looking at the amount of time spent on science teaching throughout the school year, with a view to increasing the time allocated.

5.3   Implications of the findings for three relevant areas of education

The findings and implications of this research are particularly relevant to three main areas of education. They are: professional development and learning, School Support Services organisation (providers of professional learning to schools) and school leaders.

5.3.1 *Professional development and learning*

The content framework for the coaching and mentoring programme used in this study was taken mainly from Robertson (2005) and Hughes (2004), my completion of a university paper in this subject and my own experiences as an adviser to schools and director of professional development contracts. The model was based on the science context models used by Bell and Gilbert (1996) and Hewson (2007). In addition I used generic professional development models promoted by Timperley et al., (2007). My role as a mentor/facilitator was enhanced by information and personal involvement in a current research and development study on in-service teacher educator practice (Ministry of Education, 2008).

The findings in this research support that a content framework for the coaching and mentoring programme can lead to effective shifts in the leadership practices and understandings of the teachers involved. An implication is that there are opportunities for further studies to encourage leadership growth of past and current lead teachers (emerging leaders) in primary schools, through coaching and mentoring. This to me seems to be a group of potential leaders that has not been exposed to the deeper knowledge of leadership theory and skills. There is a huge potential here to build the leadership capacity of schools. The roles that these lead teachers play are crucial to effective teaching and learning and need to be involved more in the decision making for the school as a whole. They are also a priority group from which more senior managers and leaders can be grown. The implication of this is that those providing professional development programmes for emerging leaders could consider using a mix of workshops interspersed by in-school implementation. This provides emerging leaders with an opportunity to practice and critique ideas. Reflection sessions at each workshop provide an opportunity to identify and tailor the professional development course to the needs of the emerging leaders. The sessions also offer a chance to exchange ideas within the group and gather meaningful data without interrupting the flow of the overall professional development and learning.

A further implication for the design of professional development is that it is important to allow sufficient time for emerging leaders to embed the coaching and mentoring leadership skills. The findings confirmed that a key issue with the professional

development programme was insufficient time. Three would have liked more time in between workshops to enable more embedding of the coaching and mentoring leadership skills, although the emerging leaders were not unanimous in this.

Another implication is that the context needs to be negotiated with the participants rather than be pre set prior to the professional development programme or just agreed to by the principal and researcher only. One emerging leader preferred to set her own context, as she felt that science was an externally imposed context, in spite of the school agreeing to the context originally. This, however, was outside the brief set for this research but should be considered in the future.

5.3.2 School Support Services

The core business of School Support Services is providing professional development and learning opportunities for teachers in schools. It is one of six government funded contracts held by six universities throughout New Zealand.

The findings from this study, in the first instance, will be shared with the advisors who work for School Support Services at Waikato University. There are several aspects of this research that have implications for an advisor's role. In particular, the need to support the emerging leaders' understanding of change processes, to help them develop coaching skills, leadership capacity, sustainability of change, the use of theory and the building of professional learning communities. The advisor's role is very much like that of a coach and mentor. The coaching and mentoring professional development programme in this study will be useful to share with the advisors. All advisors need to be aware of leadership both for their own role and for promoting this with others.

Sustainability of change from a professional development programme (intervention) is one of the main issues faced by schools today (Timperley et al., 2007). An implication for School Support Services is that one way of overcoming this problem is to set up a professional learning community within the school. A key part of a learning community and also of any intervention in a school is to have a lead teacher or teachers responsible for building on and supporting the on-going impact of the change. This study has looked at a way to develop these skills by asking the emerging leaders to set up, facilitate and lead a professional learning community.

An implication for School Support Services is that it is in an ideal position to provide support for this middle layer of emerging leaders In particular to encourage leadership growth of past and current lead teachers (emerging leaders) in primary schools, through coaching and mentoring.

A further implication highlighted from this study is the need for more science curriculum expertise help in primary schools. This can be seen by the short time that the learning communities discussed science as a key focus this implies that the depth of science specific knowledge by teachers may well be light. Implied also is the need for extra support to give assistance with the planning and resourcing of science. An adviser in science is in the position to provide this needed science support and advice. It is a concern for the Ministry of Education that the funding to provide this expertise is currently very limited as the focus is on other learning requirements such as literacy and numeracy in primary schools, which can give the message to teachers that science does not require a specific professional development focus in primary teaching.

5.3.3 School leader's role in providing a supportive culture

The school leader will need to consider the implications of the following points when taking on coaching and mentoring as a process involved in building the leadership capacity in their school.

Distributed leadership along with social cohesion and trust is at the core of capacity building (Harris, 2004).An indication therefore is that it is essential that the school leader ensures that any emerging leader is exposed to coaching and mentoring processes along with links to leadership theories

There is an implied need for additional middle leaders with the increasing demand on schools to provide evidence based learning, linking to student achievement at every level (Barnett and Aagaard, 2007). Most primary schools in New Zealand now have lead teachers who give support to the development of learning in new initiatives and additional support to teachers at many levels within the school. They are also a priority group from which more senior managers and leaders can be grown.

Coaching and mentoring is now seen in Britain, the USA and Canada as a key component of a teacher's role in a school. The role in New Zealand secondary schools of specialist classroom teacher (SCT) closely sits with that of a coach and mentor. My findings, in discussion with the emerging leaders, confirm that these skills, active listening, reflective interviewing, feedback, can also be used as part of the pedagogy in the classroom.

Another implication from my findings is that of providing a specialist teacher to provide science curriculum support to teachers, given the challenges faced by the enthusiastic leaders in this learning area.

Time is highlighted by my findings as an essential factor that needs to be built in to a programme to allow for reflection as part of the coaching and mentoring process. School leaders therefore need to factor time into their decision making when considering the above implications.

5.4   Limitations of this study

The nature of this research study as a three paper Masters thesis naturally led to some limitations on the depth and time taken. There are, however, some other factors that emerge which limit the study.

The pre-selected context of science was problematic. While this encouraged schools to become engaged in this research study, as they perceived that it would increase the emphasis in their schools on science, there was no specific person designated who led science curriculum development and support in the school. Findings show that the emerging leaders did not have confidence in their own science knowledge. I believe that this was one of the reasons that the science focus was not maintained in the learning communities. What is concerning is that the knowledge base of science and the holistic approach to some of the key understandings about science will be left out of the learning that children are exposed to. In addition, the timing of when science programmes are run in the schools restricts the opportunities for the lead teachers to observe and give feedback on science lessons.

Some limitations of the professional development model can be seen when looking at the criteria for effective professional learning in Timperley et al. (2007). They stress

the importance of identifying the effect of professional development and learning on student outcomes. This could have been built into the programme by allowing time for the emerging leaders to observe other teachers' practice using descriptive feedback on the teachers' interaction with students and the effect that had on student outcomes. The other teachers could also have worked with the emerging leaders to identify some key foci for observation and feedback on their classroom practice in science teaching and learning. The leadership carried out by the emerging leaders in their small learning communities could have been enhanced by getting feed-back from the other teachers in their professional learning communities. Evidence gathered from these two additional aspects of getting feedback on student outcomes and the emerging leaders' leadership practice would have given greater trustworthiness (Bryman, 2004) to this research.

The time available between workshops for the emerging leaders to practice their newly learnt skills became an issue with two of the emerging leaders. Added to that was a reluctance on behalf of the emerging leaders to give feedback to their colleagues, because they felt they were giving the impression of judging their colleagues, although judging colleagues was certainly not intended as part of the professional development programme. Certainly with more time this reluctance would have been dispersed.

I believe that the data supporting the findings would have been richer and offered more transparency if it had included comments from the additional teachers in the small professional learning communities. This is one of the recommendations for further studies mentioned in the next section.

5.5   Recommendations for further study

Although this is a small study into the effectiveness of coaching and mentoring skills on emerging leadership set in a science context, I believe that it has identified some interesting findings that reiterate some of the findings of recent international and New Zealand research.

I recommend that detailed further study of the leadership roles in other curriculum areas such as numeracy or literacy should be carried out and compared with that of a

lead role in science within primary schools. The roles of primary teachers who are in charge of managing science budgets would also be interesting to explore. Do these teachers also need to have expertise in science knowledge?

Another recommendation is the longitudinal study of small science learning communities in six other schools over a longer period of time, up to two years. These studies could explore the effect that the professional learning community has on both the teachers and the students' learning and outcomes in science.

It would also be interesting to revisit the schools and teachers involved in this study to look at the sustainability of the small professional learning communities and to get feed-back from the other teachers in the communities on their views of the emerging leader's role.

The rhetoric about the links and application of university qualifications in coaching and mentoring having wide applications for these skills in education and further afield could also be investigated.

Conclusion

The findings of this study indicate that a professional development programme based on coaching and mentoring can be effective in building the emerging leaders' leadership understandings and practice. It can provide a vehicle for building a small professional learning community in which to practice the coaching and mentoring skills as part of leadership practice. The coaching and mentoring built up the leadership confidence of the emerging leaders. The context in itself gave a focus to the emerging leader's role.

The professional development programme provided, as part of this research, an opportunity for the emerging leaders to identify different factors that contributed to a leader's role and to become aware of different leadership theories which previously none had known. The emerging leaders' understanding of this was evident in the workshop reflections, when they readily identified strategies and theories that leaders in their schools employed.

The emerging leaders are now using the coaching and mentoring skills to turn their social conversations into professional discussions and dialogue. This has enabled them to empower other teachers to find the answers to their own questions and, through this, develop deeper understandings. In addition, it has taken away the fear that they as leaders had to always come up with the answers.

They are able to talk about important factors that contribute to the effective growth of a learning community. Factors such as trust, reflection time, common clear goals and focus, deeper discussions, future planning and the importance of allowing orderly dialogue to happen rather than people talking over each other. Trust, in particular, as an essential part of a professional learning community, raised an interesting point of view. Trust was there when a person was prepared to talk openly about the negatives and some of the difficulties that they were having with their practice.

Using science as a context highlighted an awareness by the schools of the amount of time devoted to science in the schools' overall delivery of the curriculum. It also initiated, in three of the schools, the formation of a group of teachers into a professional learning community to focus their discussions on science teaching and learning, in the fourth school it initiated science discussions in an already established critical friends group.

The small learning communities provide an effective vehicle for focusing professional discussion and building the confidence and skills of both the emerging leaders and the associated teachers**.**

To sum up this thesis has shown that effective middle leadership development can occur when you have participants who are willing to explore and experiment with change. This was assisted by the emerging leaders participating fully in a professional development programme which engaged them in developing coaching and mentoring skills. This change is supported by changes in attitude, understandings and practice of middle leadership. This benefits these teachers both personally and those in their wider teaching community. It also provides opportunities to enhance children's learning. In the current New Zealand teaching climate of evidence based teaching and learning it is essential that more leaders are grown within primary schools. This can be done by promoting the use of coaching and

mentoring skills as is shown by the findings in this research. Overall this study shows that the use of coaching and mentoring as a professional development process for primary school emerging leaders, using a science context can be effective.

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Appendices

Appendix A: Letter to principal requesting participants

The Principal
Primary School
Hamilton
Date 14/W2/W2008

Dear …………,

Thanks for your interest in this project.

I am currently looking at doing research into the use of coaching and mentoring as a key professional development tool for leadership, particularly looking at emerging middle leadership and using science as the preferred context. The Coaching and Mentoring process that I am looking at draws strongly on the coaching leadership directions promoted by Dr Jan Robertson. It has been shown that this process certainly assists leaders to communicate and give feedback to others on their classroom practice in a positive and effective way.

I would like to invite you to recommend a teacher in your school who would be interested in being involved as an emerging or new middle leader in this research. This emerging leader will be asked to work with two other teachers from your school in supporting them in their science teaching in the classroom using coaching and mentoring as the process.

This is expected to link in with the recently revised New Zealand curriculum document.

My own background and passion is for science learning and teacher professional development and I am currently taking time out from my role as director of School Support Services to carry out this research.

Research has shown that coaching and mentoring is one of the key processes to assist leadership development.

The recent *Teacher Professional Learning and Development*, Best Evidence Synthesis Ministry of Education publication (2007) that looks at effective contexts for promoting professional learning opportunities that are likely to impact on student outcomes also promotes coaching and mentoring as an effective professional development process.

This research will provide a professional learning opportunity involving 4 emerging middle leaders from 4 different schools. I would like the emerging leader initially to take part in an online questionnaire. This will then be used to inform a follow up interview of up to one hour. The four emerging leaders will then meet for 2 hours 5 times over terms 1 and 2 for coaching and mentoring workshops with me. This will be at a time to suit the teachers involved. Workshop dialogues will also be audio-taped during the coaching and mentoring learning sessions. In turn each emerging leader will be asked to identify and work with two other

teachers from their own school using the coaching and mentoring process to help these two teachers identify a goal that they wish to focus on as part of their usual science classroom practice, we would be emphasizing the use of the new curriculum. A follow up questionnaire and interview of up to an hour with the emerging leader is to be used after the final learning session. The participants may also keep a journal of their experiences in coaching and mentoring. This research is expected to assist emerging leaders with their leadership skills in general but especially relating to the science curriculum and at the same time help teachers to focus on teaching science in their classes.

It is anticipated that the school will support the emerging leader teacher to enable them to meet with the other emerging leaders, also to support them in their work with other teachers in the school, it is hoped that this will naturally form part of their role as a new leader and the classroom teachers as they teach science to their children. Participation is voluntary and pseudonyms will be used to disguise the identity of participants. Neither the school nor the teachers will be identified in the research findings.

These research findings will be used to inform my thesis and subsequent publications, conferences and seminars. Participants will be provided with a copy of their interview transcript. They will also receive a summary of the research findings. On request, one copy of the thesis will be provided to the school. It is my hope that this research will benefit the middle leadership in the school and highlight science as a context for learning

This research is being supervised by Dr Bronwen Cowie, Director of the Wilf Malcolm Institute for Education Research, School of Education. The data gathering will start in late February and conclude by late July 2008

If you are interested in this project and would like to nominate a teacher who is an emerging or new leader, to be involved in this research project, could you please let me know either by returning a copy of the attached informed consent or when I ring you within the next two weeks.

I may be contacted by phone ((07)-8384458) or email janeb@waikato.ac.nz. If you have further queries you may also contact my research supervisor Bronwen Cowie by phone at 838 4500 or bcowie@waikato.ac.nz

Thank you for taking time to consider this research involvement.

If you wish your teachers to be involved please sign and return the informed consent form below.

Yours sincerely,

Jane Barnett

<u>Informed Consent</u>

I wish to nominate ……………….. as an emerging/new leader who would like to be involved in this research project

I have read the above information and understood and agree that the school will take part under the conditions set out

Signed …………………………... Principal …………… ………..School Date………

Please Fax to Jane Barnett Fax Number 8384458

School of Education, University of Waikato, Private Bag 3105, Hamilton

Appendix B: Letter to "Emerging leader"

School of Education

The University of Waikato

Private bag 3105

Hamilton

Date

Dear

My name is Jane Barnett and I am currently looking at doing research into the use of coaching and mentoring as a key professional development tool for leadership, particularly looking at emerging middle leadership and using science as the preferred context. The Coaching and Mentoring process that I am looking at draws strongly on the coaching leadership directions promoted by Dr Jan Robertson. It has been shown that this process certainly assists leaders to communicate and give feedback to others on their classroom practice in a positive and effective way.

Your principal has recommended you as a teacher from your school who would be interested in being involved in this research. As part of this leadership role I will need you to work with two other teachers from your school supporting them in their science teaching in the classroom using the coaching and mentoring process as part of your leadership role with them.

This is expected to link in with the recently revised New Zealand curriculum document.

My own background and passion is for science learning and teacher professional development and I am currently taking time out from my role as director of School Support Services to carry out this research.

In looking at the rationale for this research, the latest NZEI proposals (Cameron and Dingle, 2007) state that all teachers who wish to be considered for Advanced Skills Teacher classification need to show that they have been involved in a coaching and mentoring process.

The recent *Teacher Professional Learning and Development*, Best Evidence Synthesis Ministry of Education publication (2007) that looks at effective contexts for promoting professional learning opportunities that are likely to impact on student outcomes also promotes coaching and mentoring as an effective professional development process.

This research will provide a professional learning opportunity involving 4 emerging leaders from 4 different schools. I would like you as the emerging leader initially to take part in an online questionnaire. This will then be used to inform a follow up interview of up to one hour. The four emerging leaders will then meet for 2 hours 5 times over terms 1 and 2 for coaching and mentoring workshops with me. This will be at a time to suit all involved. Workshop dialogues will also be audio-taped during the coaching and mentoring learning sessions. In turn each of you as the emerging leaders will be asked to identify and work with two other teachers from your own school using the coaching and mentoring process to help these two teachers identify a goal that they wish to focus on as part of their usual science classroom

practice, we would be emphasizing the use of the new curriculum. A follow up questionnaire and interview of up to an hour with you as the emerging leader is to be used after the final learning session. You may also keep a journal of your experiences in coaching and mentoring. This research is expected to assist emerging leaders with their leadership skills in general but especially those relating to the science curriculum and at the same time help teachers to focus on teaching science in their classes.

It is anticipated that your school will support the emerging leader teacher to enable them to meet with the other emerging leaders, also to support you in your work with other teachers in your school, it is hoped that this will naturally form part of your role as a new leader and the classroom teachers as they teach science to their children. Participation is voluntary and pseudonyms will be used to disguise the identity of participants. Neither the school nor you will be identified in the research findings.

These research findings will be used to inform my thesis and subsequent publications, conferences and seminars. Participants will be provided with a copy of their interview transcript. They will also receive a summary of the research findings. On request, one copy of the thesis will be provided to the school. It is my hope that this research will benefit middle leadership in your school and highlight science as a context for learning

This research is being supervised by Dr Bronwen Cowie, Director of the Wilf Malcolm Institute for Education Research, School of Education. The data gathering will start in late February and conclude by late July 2008.

If you are interested in this project and would like to be involved in this research project could you please let me know either by returning a signed copy of the enclosed consent letter, to the above address, or by contacting me for further information, within the next two weeks.

I may be contacted by phone ((07)-8384458) or email janeb@waikato.ac.nz. If you have further queries you may also contact my research supervisor Bronwen Cowie by phone at 838 4500 or bcowie@waikato.ac.nz

Thank you for taking time to consider this research involvement.

Yours sincerely,

Jane Barnett

Appendix C: Letter to participants and questionnaire

Dear "Emerging leader"

Thank you for offering to participate in this research.

 I look forward to working with you over the next two school terms.

In this study there are four of you involved from different schools. I will be asking each one of you to fill in an initial questionnaire about some of the key ideas to be explored in this study. This will enable me to have a clearer picture of your ideas and perspectives that you are coming from, so that we can make the coaching and mentoring sessions as relevant as possible to your particular context. This information will be treated confidentially as set out in the written consent form.

Please take about 20 minutes to fill in the attached questionnaire, feel free to state if you have had no experience in the question asked, as this is what I need to find out.

Many thanks for giving up time to do this as I appreciate that you are all busy people especially at this time of the year.

Could you please return the questionnaire by Feb 27th to Jane Barnett, School of Education, University of Waikato, Private Bag 3105. Hamilton

Kind Regards

Jane Barnett

Questionnaire

Please spend about 20 minutes answering the following questions in writing.

1. Are you currently involved in a leadership role?

  If so, briefly explain the context.

2. What do you consider to be the role of a science curriculum leader?

3. How have you used coaching or mentoring skills in your work at school?

3. Have you have used the new revised curriculum already in your teaching?

   If so, briefly give an example of how you have used the new revised curriculum.

4. Why have you selected these particular two other teachers to be working with on this project?

5. What are you hoping to gain from involvement in this research project?

Appendix C2: Initial interview questions

1.   What is your understanding of leadership?

2.   Where did you get that idea of a leadership role?

3.   If you looked at leadership rather than leaders would you see a difference in what you were saying?

4.   If you think about science curriculum leadership, what would you see?

5.   Do you think resources are quite a key part for a curriculum leader?

6.   What do you understand by coaching and mentoring?

7.   How do you see coaching and mentoring helping you with your leadership or emerging leadership role?

8.   Why have you selected these particular two other teachers to be working with you on this project.

9.   How do you see yourself supporting the other two teachers?

10.   What are you hoping to gain from the involvement in this research project?

Appendix C3: Final interview questions

1. What is your understanding of leadership?

2. What is your understanding of science curriculum leadership?

3. What do you understand by coaching and mentoring?

4. How do you see coaching and mentoring skills assisting you in your leadership/emerging leadership role?

5. How do you see your role as an emerging leader within your school?

   Probe: Can you see yourself leading/coordinating a team?

6. What can you tell me about the science practice/planning by the teachers that you have been working with?

   Probe: Has it helped the teachers practice

   Probe: How?

   Probe: Do you see this continuing in the future?

7. Do you see yourself, in the future, using learning from this professional development programme? How?

8. Thinking about the whole study and set up are there any changes, recommendations that you would like to make?

Appendix D: Written Consent Form

Research project: To explore the use of Coaching and Mentoring as a Professional Development (P.D.) process for primary school science curriculum leaders.

Researcher:	Jane Barnett
Researcher Supervisor:	Dr. Bronwen Cowie
Both at the:	School of Education
	University of Waikato
	Private Bag 3105
	Hamilton Phone 838 4500

I, the undersigned …………………………………………. (Full name) having been fully informed as to the purpose, potential benefits and harm of this research, freely consent to participate in this research project.

I understand that:

- I will be asked to complete a questionnaire and a range of open-ended questions in a confidential interview lasting up to one hour.
- My responses will be audio-taped and transcribed. Any responses made after the audio-tape is switched off will be recorded by the researcher and added to the transcript.
- I will be provided with a copy of the draft transcript for review and comment, and retain a copy of the final transcript for my records. I am the only person able to authorize changes to transcript.
- I will retain ownership of the raw data recorded and transcribed.
- Raw data will be archived indefinitely and used by the researcher in the writing of her Masters thesis and any subsequent scholarly publications.

Right to withdraw from research
I may withdraw at any time during the study. Data that has been approved by me prior to my withdrawal will remain in the study. I may decline to answer particular questions during the interview. Should I decide to withdraw from the study, I undertake to advise the researcher of my decision in writing. Following notification of my decision to withdraw, the researcher will destroy all records pertaining to my involvement.

Confidentiality
My identity will be protected through the use of a pseudonym and demographic and geographic descriptions of my school will not be reported in either the raw data or the research findings. I understand that, five years after the conclusion of this research, the researcher will destroy any personal details which enable my identification.

Complaint Procedure
At any time during the research process, I have the right to express any concerns to the researcher and/or her supervisor. If these are not resolved to my satisfaction, I may withdraw from the study.

Signature:…………………………………………
Date:……………………………………………….
Address:……………………………………………
Phone number………………………………………… Email………………………………