Anglia Ruskin University

Engaging Schools in Learning Cycles –
A Study of the Impact of a Mentoring Model on
Teacher Empowerment

Tiki Margolin

A Thesis Submitted in Partial Fulfilment of the Requirements
of Anglia Ruskin University for the Degree of Doctor of Philosophy

Submitted: August 2009

Acknowledgements

Abstract

This applied research in education was undertaken within the context of a school mentoring programme, where my role as a mentor researcher is directed at promoting change in teacher pedagogy consistent with junior-high school educational reforms in Israel. The purpose of this study has been twofold: 1) to confront conflicting issues that exist between the need for change in teacher pedagogy and the resistance felt by many of them toward 'never ending' new reforms and: 2). to investigate the impact of the mentoring model (MM) on learning processes that foster teacher empowerment. Assessment of empowerment, as both a process and a product, drew on the teachers' metacognitive development, growing sense of satisfaction and self-efficacy as mediators of their pupils' thinking/learning skills.

This study presents a unique approach to teacher empowerment through its theoretical and methodological perspectives. Socio-cultural perspectives serve as an over-arching framework through which various theoretical perspectives for learning and development may be integrated. Action research and discourse analysis were found to be compatible with the researcher's philosophical approach, whereby educators engage in a collaborative learning process that promotes shared visions and goals. Promoting the characteristics of a learning organisation within the school shed light on ways that can provide teachers with a nurturing environment within the complex dynamics of the school. The detailed account and interpretation of the multi-level reciprocal interactions that occur between teachers, mentor and the school organisation presented in this study is especially significant for understanding multidimensional developmental processes. It illustrates the evolution of inventive methodological tools (such as skills rubrics and discourse analysis techniques), which assume to provide new perspectives for fostering the teachers' trust in their own judgement when mediating higher order thinking skills. These findings are of particular relevance as contemporary research indicates that teachers often experience difficulties in practicing metacognitive pedagogy.

Table of Contents

List of Figures

List of Tables

Chapter 1   Introduction

1.1 Background and Problem Definition

This study is connected with my work as a school mentor. In this role, I deal with fostering change in teacher pedagogy in a manner consistent with current educational reforms in Israel.

In this section, I will introduce the basic concepts that form the basis of this thesis and define the problem addressed by it.

First, I will present the general background for mentoring in Israel and the conflicts and challenges that are inherent in it. Then, I will describe the journey that triggered my goal of fostering teacher empowerment and my concern for engaging teachers in active learning. This concern led to the definition of the problem in this thesis: how to empower teachers as learners in the field of thinking/learning instruction. This section will highlight the conditions and needs through which the mentoring model (MM) evolved in this thesis.

1.1.1   The mentoring context

School mentors in Israel are appointed by the Ministry of Education and Culture ("the Ministry"), which administers the State's educational system. Internal service mentors (i.e. mentors employed by the Ministry), working in both intra-disciplinary and interdisciplinary formats, are expected to assist both novice and experienced teachers (Fuchs, 1995).

Particular focus is placed on the implementation of educational innovations and reforms as determined by Ministry policies. Many of the leading reforms echo international trends (Friedman and Philosoph, 2001; Levin, 2001)[i], either in the

implementation of constructivism in teaching, learning and assessment or in setting standards for school performance and the agenda for mentoring in schools.

Various frameworks are employed by the Ministry, where many of the professional development programmes are led by external bodies or by the Ministry's own educational projects (with names such as 'Instrumental Enrichment', 'School Climate', 'Science and Technology').

The various programmes are assisted by external or internal trainers/instructors/mentors. Fuchs (1995) describes five main working models which characterise training in educational institutions in Israel: regional training, personal training, opening doors (exposing teachers to new ideas), teachers' learning room, and school mentoring programmes. Mentoring in this study finds expression in the latter form.

Mentors are traditionally selected by their regional inspectors based on their reputation as teachers and are expected to report regularly to their inspectors on their work. Mentors fulfil a wide range of functions such as observing and assisting teachers in the school environment, conducting workshop sessions and developing new school curricula (Orland-Barak, 2002).

In the last decade, however, the Israeli educational system has been undergoing a shift in policy, providing schools with the autonomy to decide on reforms, innovations in curricula and pedagogical interventions that meet each school's particular needs (Orland-Barak, 2002). This new approach creates new challenges as well as dilemmas for mentors:

> Rather than being appointed by inspectors, mentor services will be 'purchased' by a school according to its particular needs and prospects. This implies that mentors will be compelled to 'market their services', consequently generating new kinds of ethical dilemmas and conflicts around issues of accountability and role boundaries. (*ibid*, p. 465)

Other difficulties were encountered in this complex reality relating to the boundaries of the mentor's role. Rubinstein (1999), through her comprehensive research conducted for the Israel Administration for Teacher Training and In-service Training and Instruction identified substantial vagueness concerning the definition of the mentor's role and mentor activity. In addition, she points to contradicting trends in the Ministry's policies that set conflicting objectives for the mentoring system. Similarly, I was faced with contradictory goals and a lack of clear guidance in delineating boundaries for my role as mentor; on one hand, the Ministry calls for teacher empowerment and the enhancement of dialogical relationships in schools, while at the same time imposing external exams administered under short time limits and demanding an improvement in pupil thinking skills and achievements that meet national and international standards.

This trend toward educational reforms that focus on 'performativity' (Ball, 2003, p. 215) is forcefully criticised by different scholars who view the spreading of reform across the globe as 'a policy epidemic' (Levin, 1998, in *ibid*). Ball (2003) and Brady (2008) point at the emotional constraints that these reforms are producing. Standardised testing affects mentor-teacher relationship when mentoring aims at assisting teachers in raising teaching and learning standards:

> …these technologies have an emotional status dimension, as well as the appearance of rationality and objectivity. Thus, responses to the flow of performance information can engender individual feelings of pride, guilt, shame and envy. (Ball, 2003 p. 215)

Other constraints on mentor work have been added by the new decentralised policy, where schools engaged in several intervention programmes, as each provided additional benefits (monitory support, prestige or publicity) Thus, school autonomy, when choosing a mentoring programme, is not always directed to meet pressing pedagogical needs, as Fullan (1997, p. 26) clarifies:

> Much of school life seems to follow an endless cycle of soliciting funds, implementing new initiatives, and then going out to solicit more funds for even newer initiatives to replace current ones.

In these circumstances, teachers can find themselves participating in several at times seemingly contradictory intervention programmes, each with its own agenda   For example, one programme refers to raising uniform standards and promoting achievements in national exams, while another addresses multiple intelligences, accommodating teaching strategies to individual's learning style and disposition. Thus, while teachers need to cope with these changing requirements at school, anxiety and stress become a part of their actual learning processes. In addition, the lack of clear direction often leads, in my experience, to feelings of burnout and a lack of motivation toward further involvement in learning. Ball's (2003, p. 220) description highlights this state of affairs:

> We become ontologically insecure: unsure whether we are doing enough, doing the right thing, doing as much as others, or as well as others, constantly looking to improve, to be better, to be excellent. And yet it is not always very clear what is expected.

These different conflicting issues and the dilemmas they raise set the stage for my proactive approach to teacher mentoring. For me, they emphasise the need to foster learning conditions in schools that can lead to pedagogical innovations. In an era in which governments declare the need to raise school standards (Friedman and Philosoph, 2001; Pollard, 2002), where critical thinking and problem-solving skills are regarded as essential learning goals (Wyatt-Smith and Cumming, 2003), the teachers' need for professional growth appealed to me as a challenging mentoring objective.

The next sub-section will present my background as an educator (as a teacher, mentor and researcher) and how my concern for promoting teacher developmental processes evolved.

1.1.2   A cause for concern

Approximately twenty-eight years ago, when I began my teaching career in sciences in a secondary school[ii], I planned my lessons so as to create experiences that would stimulate my pupils' thinking and their curiosity toward investigating the studied phenomena. I found myself searching continuously for communication strategies to create a dialogue with my pupils. Through this involvement, I was able to evaluate pupil progress and identify difficulties.

Looking back, I realise that my focus on finding ways to arouse pupil interest and excitement, together with the search for solutions that would guide them to cope successfully with the different learning tasks, resembles the path of action I took later in facing the teachers whom I mentored in various settings. Whether in teacher-mentoring, in the management of science and technology teaching in school, or in facing teaching staffs in other schools, my main pursuit accompanying these interactions was to experiment, develop and apply a variety of teaching methods. I did this while enlisting the learners in active partnership. When I found such methods to be only partially effective, this only triggered additional incentive for experimentation.

Over the last two decades, faced with educational innovations and reforms, I have enthusiastically adopted new directions for teaching. I have attempted to arouse my pupils' enthusiasm throughout the learning process, particularly in those who lacked that special 'sparkle in their eyes' – an image that for me signified that an exciting moment in the learning experience is occurring. It guided me, intuitively, through years of teaching and mentoring, allowing me to sense the level of engagement of my partners in learning. This image and its relation to empowering learning processes, was corroborated by recent findings from brain studies (see Sub-section 2.2.1), and found expression in the advanced stages of this study. Realising the significant power of images and metaphors in guiding me through the different collaborative learning activities led to my decision to weave them throughout my writing.   Each had its own authentic contextual meaning to which I will correspondingly relate in the different parts of this work.

As I developed a rich 'tool box' and began to promote change, initially within the staff of science teachers that I coordinated in school, I found myself asking:

- Why didn't my enthusiasm for experimentation with innovations in teaching infect many of my colleagues?

- Why was it that when we completed a learning project that was unsuccessful, I turned to explore and learn the necessary lessons, while some of my colleagues disappointedly lost their 'appetite' for new learning and experimentation?

Looking back, I can say that I found much satisfaction each time I discovered previously unidentified aspects of learning that prevented pupils from successfully performing the tasks that had been planned for them. I used to cite one of the Dalai-Lama's adages to my colleagues in the staff when a classroom learning activity did not live up to our expectations, whereby we may have failed but we have gained a lesson. It is a lesson since a problem previously concealed from us had been exposed. This, I assumed, would enable us to modify our coping strategies for the problem we encountered. My colleagues looked at me as if I was strange because I insisted on looking for different ways to enlist energies that would encourage pupil learning. What I have often heard from many of them about the pupils was: "They're just lazy …", "They have difficulties" or "Those children are not interested in school".

During those years, I was often frustrated and sometimes even angry at those teachers. How to lead teachers toward self-direction remained an enigma. It was only through further learning that I realised that my judgemental approach lacked a systems[iii] perspective for teacher learning. My personal perspective overlooked the different nurturing factors needed for tapping teacher commitment (Senge, 1990) and efforts in a constant mode of learning.

1.1.3 Developing a systems approach to teacher learning

Changes that were introduced in school policies provided an opportunity for me to widen my previous perspective in relation to teacher professional development. My search for answers was in fact a way to redefine the system in which I worked. I will gradually unfold this personal development below.

The reforms in education in the 1980s and 1990s rapidly followed one another from alternative strategies for teaching to alternative assessment. Not a few teachers in my science staff developed a sense of contempt for these new ideas, as they were already in the midst of an experiment that was only recently presented as innovative. Dror (1986, cited by Levin, 2001) describes this unstable environment as "fuzzy gambling", where the rules change while the game is played and "surprise dominates". This lack of motivation to experience another professional development program, and the subsequent lack of innovation in teaching, continued to constitute a source of frustration and disappointment for me at that time.

Retrospectively, I realize that I was a teacher who looked at her work critically and reflectively, though I was not aware then of these concepts. The desire to find coping strategies in the teaching arena motivated my learning. It was not without good reason that a study that I performed at that time (Margolin, 1998) dealt with the contribution of a teaching strategy that I had formulated to foster pupil understanding of abstract terms in science (when studying the 'particles model' of atoms and molecules). This strategy aimed at providing the pupils with a tool to enhance scientific thinking and simultaneously provide teachers with a tool for dialoguing with their pupils. It was also used as a tool that aimed at providing science teachers with a systemic view of their practice whereby the teacher uncovered pupil understandings/difficulties through a model they constructed and the pupils are provided with an opportunity to reflect upon their learning experience. I found here an opportunity for learning which the teachers could exploit to identify alternative perceptions of the pupil and simultaneously guide

him/her through a process of conceptual change (Posner et al, 1982; Hewson, 1992). I did not realise then that I was practicing Vygotsky's (1962) methodological approach, which focuses on exploring dynamic developmental processes.

Contrary to my experience and expectations, this variety of innovative strategies did not produce teacher satisfaction. The toolkit of teaching strategies that I had found productive was ineffective in enlisting the teachers' learning energies. A hard core of teachers on my staff resisted the reforms I was trying to institute in science and technology.

During the 1990s and until 2001, as I developed as a mentor and a teacher, I became more aware of the processes that reduced the teachers' sense of empowerment, a concept that educators in Israel have used widely during the last decade. Initially, empowerment meant to me that teachers would be afforded with learning opportunities to develop and gain their natural place as leaders of educational innovations. However, through my intensive involvement in leading science and technology programmes in school, I began to recognize the significant role management support plays in these developmental processes. In addition, I was able to identify how the lack of communicative dialogue between the teachers and 'change agents' (mentors, supervisors) who entered my school failed to contribute to the expected pedagogical breakthrough.

I recall one particular case when we arrived as a staff of science teachers at a seminar organised at my school, and we definitely expected to 'receive tools' that would help us in our difficulties in coping with teaching, especially at the junior high school level. The seminar was conducted by a mentor who seemed to us to be young and lacking in experience. From her answers to our questions, it was clear that she lacked significant teaching experience. We were annoyed that a mentor, who had only two years of teaching experience, offered us a means for teaching in heterogeneous learning groups without having used them herself. I remember, almost regretfully, how we 'battered' her with questions, such as: 'What do you do

when the pupils do not cooperate?' 'What do you do when advanced pupils are not interested in further enrichment levels? We asked her to present examples from the field, as we needed "live examples", pupil products, to demonstrate the practicality of her method to us. In effect, we felt that only someone who had experienced the work in class and had coped with it successfully was fit to guide us through these challenging tasks. Such personal experiences had considerable value later on when I was mentoring teachers in this study. Being familiar with the reality and culture of the school environment contributed to my sensitivity and awareness of teacher learning needs.

My growing awareness of the impact of school management on teacher learning and development led to my first success in mentoring the science teaching staff in my school. It was a meaningful milestone from which I also gained considerable confidence in guiding teacher learning processes. It occurred when the programme I led received support from the Head-teacher and management team. They believed in my ability to lead change. When the Head-teacher explicitly supported the programme I led it signified to the teachers that their work received value and prestige in the organisation. In addition, at my request, the teachers were paid for their additional time and efforts. This was another way that the teachers sensed the support of the Head-teacher. From this stage on, they collaborated in the development of a teaching programme aimed at providing pupils with strategies for coping with challenging learning tasks. The teachers became open and accommodating. When the partnership was accompanied by growing trustful relations and reciprocity, I began to discern that some of them had been 'infected with the virus' that was well known to me, whose symptoms started with the search for answers and questions, such as: 'How can I improve my teaching?' 'What does the fact that the pupils acted in this way indicate?' These were, for me, the initial 'symptoms' of teachers who underwent a meaningful learning experience. They were motivated by their desire to search for effective innovative solutions; solutions which in turn motivated the pupils toward cooperation and involvement in the learning process.

For two years my staff was professionally enriched; many of us spent hundreds of hours in collaborative learning processes that led to the development of a school curriculum that integrated science and technology. The curriculum proved to be successful, as teachers and pupils engaged enthusiastically in learning and developmental processes.

However, following changes in management personnel and policy (a new Head-teacher and management team, as well as a gradual decrease in the teachers' financial compensation), I noticed signs of slowing and regression in the involvement of some of the teachers in the collective task. In addition, the new Head-teacher failed to maintain and support the reform that previous management had engendered.

Additional demands from science and technology policy-makers, together with the shift in the schools' management policy, limited further developmental processes in my staff. A substantial number of teachers, who had promoted new ideas and had become enthused by the joint learning processes, began to express frustration. 'Why is it only our staff that has to stay after hours to develop new materials?' or – 'Other staffs don't have meetings at all, they simply "close their stalls" and go home in peace'. Other teachers became enraged by the slowdown and claimed that as the staff coordinator I had "given in" to the teachers who had stopped coming to staff meetings. Despite their complaints, these teachers continued their active participation in the joint enterprise. It seemed that they had engaged in a path that was challenging and rewarding for them, as they coped successfully with emerging dilemmas in class.

At this stage I was convinced that my pursuit for teacher empowerment through pedagogical innovation was doomed to fail without the support of the organisation's management, and of the school Head-teacher in particular. Without linking the teachers' learning with the school's vision and goals, I believed it would be impossible to expect a significant change in the teaching methods of most teachers. Consequently, I was motivated to exploit these new insights as a mentor outside of

my school. Beginning in 2000, mentoring schools became my principal undertaking.

1.1.4 Exposure to new perspectives of learning

In the years prior to this study (1998-2001), my work mentoring in several schools, as well as participation in a training course for mentors, has had a great impact on my development as a school mentor. The theories to which I was exposed and the reflective discussions in which I have taken part were enriching. Insights began to evolve within me, yet many unanswered questions accompanied them. All of us, the mentors, essentially wanted to learn how to succeed in guiding teachers toward introducing pedagogical/organisational changes, which was the clearly intended culmination of the mentoring process.

Each of the courses in which I participated revealed a new approach designed to help us. These approaches included such names as: reflective practitioner, cognitive coaching, trust-building communication, resistance to change, organisational structure, the position and role of the manager in an organisation and change dynamics. Consequently, the complicated tapestry from which the teacher's work environment is woven became more enriched for me every day. The large 'holes' in this tapestry, those same hidden areas of which I was unaware and through which I often fell, became proportionately smaller. This metaphor helped me understand how my perception of the system involved in teacher development widened and deepened; mentoring became more of a solid, thick net, on which I could safely tread.

My readings on learning and change processes in organisations (e.g. Covey, 1989; Senge, 1990; Sarason, 1990; Fullan, 1998) further directed my attention toward more carefully considering the Head-teacher's needs, which I had tended to ignore in the past. In addition, the way to enlist the teachers' energies for learning and pedagogical innovation became clearer as my systemic perception widened. Teacher learning and the school organisation as their learning environment came to

be perceived as parts of one whole (system). I began to gain a new understanding of the learning environment needed for nurturing teachers' development.

Weinberg's (2001) argument clarified for me the essence of these revelations, further deepening my understanding of the 'system' concept. Weinberg rejected arguments made by systems writers (e.g. Checkland, 1999 in Larses and El-khoury, 2005) about the 'emergent' properties of a system, as properties that did not exist in the parts but are found in the whole. His claim is that no new property is discovered, but rather a relationship between a system and an observer is formed. Accordingly, properties emerge for a particular observer when she/he did not or could not predict their appearance. From this stance:

> …any system is the point of view of one or several observers. Whether our view – or their view – is good or bad can only be judged according to the purposes which the system is designed to satisfy. (p. 62)

Similarly, the system I initially observed was that of the pupil and the teacher. Teaching/learning tools were substantially paths for learning interactions between teachers and pupils. With each new developed insight, I began to observe additional parts of the system of which I was previously unaware. My growing awareness of the school environment as an essential factor in teacher growth manifested itself in a new point of view. I was undergoing a dynamic process that continually modified my perception of the system.

It became apparent to me that the knowledge that I had gleaned over two decades of teaching, as well as the work with the school staff with its rich variety of content, was insufficient to cope with the teachers' resistance toward engaging in continuous change and innovation. My main concern was: 'How can teachers lead the next generation in a way that meets today's standards without being perpetual learners themselves?' The struggle in this challenging task generated many other questions that motivated me to look for answers.

1.1.5   Motivating questions

- How can I engage my teachers in continuous cycles of learning?

- How can I prevent a vicious circle, one in which the teachers expect each learning experience to wave a magic wand, such as a strategy that will be 'the answer' for fostering their pupils' development as skilled learners?

- How can we escape from a situation where the teachers continue to blame policy designers and those who write instructional programmes of which they don't approve?

- How can we escape from situations where the educational system and society blame the teachers as the ones who do not know how to implement new reforms?

It seemed to me, at that point, that the pupils' failure remained orphaned – no one took responsibility for it.

These questions were the nurturing ground for more acute ones, through which an alternative direction opened for me:

- How can I enable teachers to sense empowerment (where their efforts are valued and have impact on the school activity)?

1.1.6   Guiding answers that illuminated my way

I can recall two specific instances that significantly focused my attention and behaviour as a mentor.

The first occurred during a course on organisational learning; it was in the framework of an encounter with the work of Kurt Lewin (1946) in a mentors' seminar led by lecturer Eli Teicher.[iv] In one of our sessions, where we discussed different conflicting episodes, one of the mentors in our group complained that after

all his guidance as a mentor and his investment in assisting teachers in one of his schools, the Head-teacher stood up in a certain forum and presented the school programme as though he himself had initiated the idea and not the mentor. Eli's response, noting the disappointment and hurt feelings in the mentor's voice, was as follows: 'If the Head-teacher relates to the new programme as if it were his own, then this is a sign that you have succeeded well – if the Head-teacher claims to own the change, then you have done your work'. He then took us to a higher level of understanding when he articulated the following metaphor: 'In mentoring, when you face the people that you assist, it is necessary to prepare a large trunk to store your ego'.

This reply had a great impact on me in my role as mentor over the following years, guiding me to a different perspective. This new path allocated a wider space for teacher and Head-teacher needs. My feelings of anger, frustration or insult when teachers did not cooperate with me or rejected my plans (see Appendix 1) were based on the assumption that the teachers I mentored were either challenging my abilities or my authority. These feelings begun to fade and were gradually replaced by other ones. I began to check and look together with my mentees for an alternative path to accommodate their newly awoken needs. When this new perspective took hold and I prepared a 'big trunk for my ego' as Eli suggested, the centre of gravity and focus of my actions turned to the teachers' needs. At this point, my attention was directed toward their comments and complaints, as well as their compliments, as new lenses through which to direct my assistance.

This transformation in my behaviour was enhanced when I chose to delve deeper into the literature concerning teachers and work in organisations (mainly Senge, 1990; Schön, 1987; Covey, 1989). Parallel with this supportive knowledge, I found myself more receptive to listening to the teachers' needs. At first, I did so as a way to minimise their resistance to the intervention programme. It was as though I said to them: 'You are the teachers who know, I have not come to repeatedly point out that you do not know enough – my position is that, despite your rich teaching experience, it may be useful for you to try a new path with me…' The message that I received from the teachers following these learning sessions was that they

experienced something important – they gained strength with me and confidence in their abilities. I reached a state where the teachers told me: 'You are not like other instructors who gave us the feeling that we didn't know anything…who told us to "listen and learn in order to succeed"…instructors who do not value what we already know and have developed.' These experiences began to seep slowly into my consciousness, enabling me to gain insights into the advantages of developing a dialogue of mutual learning with the teachers.

The next meaningful turning point in my development as a mentor was during a seminar course dealing with case studies concerning mentoring teachers. During one of the sessions, our leader Michael Kraindler[v] asked: 'What in your opinion is your most important function as a mentor? What is the most significant goal in your work with teachers?' Each of us in her/his own way expressed what we thought was important: 'To bring about change in the school'…'To enable the teachers to adopt new programmes'…'To develop new programmes'…'To develop the teachers' professionalism.' Then Michael said: 'Your most important role is actually to enable the teachers to discover their potential.' A moment of silence fell in the room – then a shower of questions resulting from the astonishment that gripped us. 'What do you mean "Only to enable?" To discover their ability? … 'But they don't know! …'They need to learn first.' The mentors claimed that there are many learning theories, areas that the teachers should master first in order to be able to develop. As I thought more deeply about Michael's statement, together with my improved listening to the teachers' needs, I sensed how my insight was again broadened, becoming more sensitive, absorbing the potential embodied in the teachers. Gradually, I began to understand the similarity of the learning interaction between pupils and teachers and between teachers and the mentor.

1.1.7   The identification of parallel processes in the system

Broadening our perspective provides us with a wider perception of reality, thereby contributing to our ability to cope with it (Vygotsky, 1978; Cohen, Manion and

Morrison, 2000). Similarly, rather than focusing on teachers and pupils within the school organisation, my perspective grew to include myself as a mentor as an additional component on which to focus my observations.

The parallel that I found was as follows: We, the mentors (as a subsystem within a larger system), actually have similar relations with our teachers to those that the teachers have with their pupils. We are unaware of their abilities, their potential. We aspire to transmit knowledge to them; strategies, programmes, tools or methods. Based on my conversations with other mentors, they were also unaware of this distressing inconsistency between our knowledge of learning methods and the manner with which we practiced it with the teachers. To the teachers we said – 'Connect with the pupils' previous knowledge'…'Respect the place from which they begin'…or 'Enable them to find their own preferable learning styles.' At the same time, many professional development programmes expect mentors to impart new knowledge to teachers and to implement these programmes without any consideration of their previous knowledge, expectations or difficulties. We also do not listen. Often we do not even suggest that they bring their own plan and thus take responsibility for their choices.

According to the Ministry of Education's GEMS surveys (Growth and Effectiveness Measures for Schools, 2005), a majority of teachers do not really believe that pupils with learning difficulties have a chance to succeed. Similarly, I had not believed that the teachers, who were unaware of new teaching and learning strategies, could advance if they did not first thoroughly learn what I knew and use the strategies that I would 'transmit' to them.

As mentors, pointing to the teachers' resistance to change was our principal observation when interpreting their lack of interest in engaging in additional learning. The idea that many of us, educators in professional development programmes, are unaware of the many parallels between the learning processes of teachers and children, seemed to gain more validity as I progressed along the different cycles of this study.

Thus, one idea that began to coalesce within me was that teachers should be provided with a supportive environment in school, similar to what they are required to provide to their pupils. From my experience, most teachers rarely experience a constructivist learning environment, neither during their own academic learning nor through professional development courses.

This idea finds resonance in the professional literature concerning teacher professional development programmes. Miles, for example (1995, cited by Keedy et al, 2001 p. 39), claims that in many professional development programmes, the learning environment provided to teachers is 'everything that a learning environment shouldn't be', and leads away from empowerment. Even when practical workshops have taken place, they are usually infrequent. The instructors in a multi-participant workshop were not able to relate to the individual teacher's prior knowledge (Ausubel, 1968) or the emotional constraints within which they exist. Yet these are the emphases that the teachers are required to provide in their classes. This inconsistency exists between the expectation that teachers promote pedagogy with a constructivist perception, while at the same time they are afforded experiences characterised by behaviouristic strategies. Moreover, when teachers do experience active learning in workshops, they at best experience 'naive constructivism' (Prawat, 1992, in Sillman and Dana, 1999). In such cases, the activity is equated with learning, while ignoring the role of reflective thinking that should accompany the teacher throughout the learning process.

1.2 The Mentoring Context in this Study

From my study of the professional literature, I came to believe that an era of constant socio-economic change would exert pressure on schools to foster teaching of skills in order to enable pupils to cope successfully with a rapidly changing environment. I also believed in the provision of significant learning opportunities for teachers, through which they would become partners in the development of innovations aimed at coping with these needs.

My appointment to the school that participated in this study was part of the Education Ministry's new policy for providing assistance to schools that undergo periodic standard inspections ('GEMS', 2005). These inspections reflected a change in the Ministry's policies (beginning in the 2001-2002 school year). Until then, only the upper secondary schools had been included within its inspection and assessment system through matriculation examinations.[vi] The Ministry's declared purpose was to produce data that would inform schools of their academic achievements as well as their school climate (in comparison with the national average). The working assumption was that the school staff would derive conclusions from these indices in order to achieve growth and improved effectiveness. Each school in the region that participated in the Ministry pilot study (2000-2001) was given autonomy to choose of the mentoring field needed for its improvement.

I shall now describe the nature of the mentoring which I was required to provide in this school and how I prepared myself for this challenge. My personal aim was to successfully implement the significant insights that I had gained through my previous mentoring experiences. I was referred to this particular school because of the Head-teacher's desire to improve teaching methods in order to assist pupils in coping successfully with new national standards. This school was identified by the school inspector and my superior, the senior mentor, as a particularly challenging environment for mentors: the Head-teacher was described as a person with high pedagogic standing and as having a significant presence in the school. His staff was known to be highly opinionated. Considering the above, mentoring in this school appeared to be a challenging mission.

Underlying these needs, intense processes had taken place in the educational system in Israel. These were led by policy-makers in the Ministry of Education who called upon teachers to participate in professional development programmes. The heavy workload, together with the teachers' lack of satisfaction with many of the regional developmental programmes, contributed to a sense of burnout for many of them, as well as to their lack of motivation (38% of the teachers in 2002, according to

'GEMS' report, 2005). I knew this to be true from my own experience, and was confirmed by my colleague mentors. These characteristics of the teachers' learning environment, accompanied with criticism and lack of appreciation of their work, have also been noted in other studies (e.g. Sharan, Shachar and Levin, 1998; Aviram and Yona, 2003; Dinham and Scott, 2004).

The deep concern I developed about this situation together with my strong belief in the power of engaging teachers in a collaborative enterprise, sparked my desire to explore ways that would engage them in learning processes that empower them to cope successfully with the challenges of the school environment. The purpose of this study will be presented in this context.

1.2.1   Purpose of this study

The main purpose of this study is to explore the impact of the MM (mentoring model) on teacher empowerment. I conducted it as a mentor and as a practitioner researcher with the collaboration of teachers at a secondary school together with their management team. The mentoring programme aimed at restructuring the school's pedagogy by co-producing a curriculum with a thinking skills core. Empowerment in this thesis refers to the development of professional teacher competencies in fostering their pupils' thinking/learning skills. This developmental area, which was chosen by the teachers, was particularly challenging, since the emerging need of the 21st century is to initiate procedures that will enable educators to fulfil their role as key players in the development of a learning society (Fullan, 1993; Fullan, 2007; Claxton, 2008).

1.2.2   Research questions

The questions posed by this study evolved through three cycles (lasting over a period of three academic years). The first cycle (lasting two years and constituting the pilot stage) was guided by implicit questions directed toward finding ways of fostering teacher empowerment.

Questions that guided my concern in the first cycle of this study:

- How to stimulate teacher interest and motivate innovations applicable to their teaching programmes?

- How to promote teacher learning activity, combining their efforts in a satisfactory way, which would respond to their needs?

The following questions were derived from the first cycle, where teacher interest in fostering their pupils' thinking/learning skills led to appropriation of questions:

Questions that guided the second and third cycle of this study:

Central question

What impact does the mentoring model have on teacher empowerment?

Sub-questions:

a. What impact does the mentoring model have on the development of teacher metacognitive knowledge when mediating the learning of thinking skills?

b. What impact does the mentoring model have on the development of teacher metacognitive skills when mediating the learning of thinking skills?

c. What impact does the mentoring model have on teacher satisfaction and sense of self-efficacy?

Two secondary questions arose as a result of the secondary and tertiary analysis of the findings:

    a.   What impact does the mentoring model have on the empowerment of the organisation?

    b.   What impact does the mentoring model have on the empowerment of the mentor?

1.3 Significance of this Study

The main significance of this study is its holistic approach to fostering pedagogy that enhances pupils' thinking/learning skills. Considering Claxton's (2008, http://www.guyclaxton.com/documents/Routledge%20Companion%20to%20Ed %20chapter.pdf) accent on the need 'to find practical ways of seeding a culture of change in the classroom (or the school as a whole)', it is assumed that this study will shed light on ways to engage teachers in empowering learning processes and in transforming the school's culture of learning.

Further significance is embedded in the MM, whereby it offers an effective multidimensional approach which might fill the gap between the mentor's perception of appropriate goals and those perceived by the educational system (e.g. Rubinstein, 1999). Presentation of the MM through its evolution provides different paths through which educators as teachers and mentors can engage as practitioners in constructing new knowledge.

Creating such meaningful experience is derived from a continual dialectics among theoretical, methodological and philosophical perspectives woven throughout the inquiry. This dynamic has yielded a coherent structure relevant to the challenge of meeting current needs for developmental models in schools of a kind that is 'more gently cumulative, more organic and experimental, and more involving of students' critical and creative energies' (Claxton, 2008, http://www.guyclaxton.com/documents/Routledge%20Companion%20to%20Ed

%20chapter.pdf). The present research focused on enlisting teachers' energies for learning and development in order to meet this end.

1.4 Organisation of this Thesis

This thesis is organized into six chapters.

- Chapter 1 (Introduction) references the background and the defined problem in this study.

- Chapter (2) introduces theoretical perspectives of the research which grew out of the above background and evolved throughout this work. It presents the different sets of lenses that structured my integrative theoretical perspective and guided me in mentoring teachers towards their empowerment. The pragmatic approach to theorising in this study is aimed at achieving coherency between theoretical perspectives and practice. This approach found resonance in Vygotsky's socio-cultural approach (1962, 1978) which provided an integrative, overarching framework. Through it additional theoretical perspectives were woven, affording a practical tool for studying and fostering teacher empowerment.

- Chapter 3 (Methodology) presents the multidimensional approach used by the MM to foster growth and assess teacher empowerment processes within the school's dynamic and complex environment. It accents the dialectical relations between theoretical perspectives and practice. In this way, learning, assessment and developmental processes in this study constituted parts of a complex whole (Vygotsky, 1962).

- Chapter 4 presents the research findings and initial levels of discussion which reflected the ongoing dialectic between theory and practice. It presents the findings through the three cycles of the study – Section 4.2 relates to the first cycle of the study (the pilot study) whilst Section 4.3 relates to the second and third cycles. The first cycle, which was executed over two academic years, determined the research categories

that were employed for assessing growth in teacher empowerment in the subsequent two cycles (executed in a single academic year). Section 4.4 summarises the main findings in reference to each of the research question. Cross-analysis (Section 4.5) highlights reciprocal interacting levels of empowerment among teachers, mentors and the organisation.

- Chapter 5 (Discussion) introduces a higher level of conceptualisation of the findings, accenting interacting levels within the school's mentoring programme. In addition, it references current studies which address similar issues in mentoring and teacher empowerment.

- Chapter 6 (Conclusion) presents the principal conclusions derived from this study. This chapter emphasizes the contribution of this study toward filling gaps in knowledge related to teacher empowerment. In addition, it presents the limitations of this study and recommendation for future research.

Chapter 2   Theoretical Perspectives

2.1   Introduction

This chapter presents the extensive range of theoretical perspectives which were woven into the conceptual framework of this thesis. The various concepts that have been incorporated into this framework are the product of my goal, as a mentor and practitioner researcher, of organising a coherent theoretical framework that supports developmental processes in the school organisation. A comprehensive review of the professional literature with regard to each of these concepts is beyond the scope of this thesis. Instead, I will focus on how the different concepts correspond with the research data and their suitability for highlighting developmental processes.

Such an approach is consistent with Blumer (1954, cited in Bryman, 2001, p. 270), in which concepts are used in a way that provides 'a general sense of reference and guidance in approaching empirical instances…a general sense of what to look for'.

This pragmatic approach to theorising, which is knowledge-based and action-oriented **(**Dewey, 1916), assisted me throughout this study in coping with the complex and unique school environment (Fullan, 1993, 1998) in which the study was conducted. It mirrors Fullan's (1998) description of innovative change, where practitioners consistently test and modify their own theories in a dynamic environment.   Studying the teachers' developmental processes this way is a manifestation of the constructivist approach to learning. It explains the existence of the many different types of constructivism such as radical, social, physical, evolutionary, post-modern and information-processing (von Glasersfeld, 1995; Bruner, 1996; Karagiorgi and Symeou, 2005; Sjøberg, 2007), where each individual researcher constructs knowledge through his/her own experiences based on his/her own philosophical and contextual knowledge.   von Glasersfeld's statement (1995, p. 459) that 'there are as many varieties of constructivism as there are researchers' mirrors the many ways to conceptualise reality.

2.1.1 Relevant Theoretical Perspectives for Learning and Development

In an era of accelerated change, enabling teachers to realise their role as key players in the learning society of the 21st century (Fullan, 1993; Wells and Claxton, 2002) is viewed as a significant goal. To meet this end, it is necessary to develop a relevant and coherent theoretical framework. This section will present general considerations involved in framing constructivist research perspectives.

While the behaviouristic approach considers the learner as a controlled respondent to stimuli (Perkins, 1991), constructivism views knowledge as derived from the individual's need to make sense of the world (Bruner, 1996). In constructivism, knowledge is a construct of the individual's active participation in learning and knowing and thus cannot be imposed or transferred from one mind to another. Moreover, it is an adaptive process that organises the individual's experiential world (Mayer, 1992). Likewise, in the context of this study, teacher engagement in productive learning did not mean the 'capturing' of information as an entity with its own defined properties and its 'transmission' to pupils, which is the case in many professional development programmes. A constructivist approach, then, is more appropriate, but leaves the question of how to choose a relevant framework for teacher development out of the many paths to constructivism unanswered.

Piaget, who coined the term constructivism before its use by academics in other fields (Sjøberg, 2007), developed a theory of knowledge construction that has been widely influential in education. I will present central aspects of his approach which will be used throughout this thesis to highlight the debate between various constructivist perspectives and their relevancy to teacher development.

Piaget's theories are based on ideas derived from biology, using terms like adaptation, assimilation and accommodation. His stage theory, which relates to intellectual development through which each individual must pass, was embraced

enthusiastically by educators. 'Names like the psychomotor, the intuitive, the concrete operational and the formal operational stage soon became part of educational terminology' (*ibid*, p. 5). Piaget's stage theory received support because of its practical application. In addition, his 'wish to formulate general theories in a mathematical way' (*ibid*, p. 4) appealed to educators in science and mathematics as it lent credence to their scientific approach.

Further praise was given to Piaget's work by Vygotsky (1962, p. 9), who pointed out that Piaget 'revolutionised the study of child language and thought… [and] was the first to investigate child perception and logic systematically'. Moreover, he highlights Piaget's unique approach which concentrates on 'the distinctive characteristics of child thought…rather than on what the child lacks.' (*ibid*)

Despite these positive qualities, Vygotsky (1962) noted several deficiencies in Piaget's work. What is particularly insightful is the way by which Vygotsky derives his assertions. He directs us to look for Piaget's hypothesis, 'the philosophy behind his rich data' (*ibid*, p. 11), through which Vygotsky concludes that 'Piaget's work suffers from the duality common to…contemporary works in psychology…as it develops into a science in the true sense of the word' (*ibid*, p. 10). For Vygotsky, approaching cognitive development (thoughts, consciousness) separately from the interacting role of cultural/social factors is inadequate. He ascribes this tendency to 'science and its methodological and theoretical premises' used by Piaget 'which have long been a subject in dispute between materialistic and idealistic world conceptions' (*ibid*, p. 10). Ratner (2004) supports this distinction, explaining that what Piaget suggests as cognitive developmental stages and their specific sequences are now viewed as a culturally-dependent variable. He explains that rather than a rigid, age-graded sequence that determines the level of development, it is familiarity with the task, social stimulation and requirements that affect one's cognitive performance.

Vygotsky's (1962) distinction shows that he recognized, almost a century ago, what later on was found to be constraining in Piaget's work. His claim echoes new ways

of conceptualising psychology today (Leahey, 2003; Pickering, 2006), accenting the need for 'a generally accepted system incorporating all the available psychological knowledge' (Leahey, 2003, p 10), instead of inquiring about cognition separate from social, cultural and biological interacting factors.

Though Piaget's constructivist ideas triggered a wide range of studies during the late 1970s and early 1980s (which had a major influence on corresponding curriculum projects in science education), his stage theory and its theoretical underpinning gradually lost supporters and popularity (Sjøberg, 2007). I will elaborate later in this chapter on various Piagetian perspectives which were relevant to this thesis.

Seen from a historical perspective, the debate about appropriate teaching methods that are most likely to lead to growth through learning processes has deep roots (Zellermayer, 2004). During the 20th century, while the education field was immersed in the debate whether teaching should focus on providing content and skills or, alternatively, on the learners and their development processes, Vygotsky (1962, 1978) suggested bypassing this controversy. He directed attention to the dialogue that takes place between learners and instructors (Kozulin, 2004; Zellermayer, 2004; Mercer, 1995). He claimed that learning is a process that takes place in the interpersonal space between learners and significant others when learners seek to develop skills and knowledge. In comparison, Piaget had a general interest in knowledge but not much in education or teaching (Solomon, 1994, in Sjøberg, 2007), which makes Vygotsky's approach more relevant to this thesis. The next sub-section will elaborate on this issue.

2.1.1.1 The relevancy of Vygotsky's work in the context of teacher development

In his seminal work that serves as a cornerstone for socio-cultural theory, Vygotsky (1962, 1978) presents a holistic, multidimensional model for understanding learning processes that explains the unique pattern of psychological development in humans (John-Steiner and Souberman, 1978; Kozulin, 2004). This orientation is appropriate in the context of this thesis. It provides a framework that encompasses teacher development within the multilevel interactions that occurred in this study through the school mentoring programme. Moreover, Vygotsky's perspective, by which new mental development arises qualitatively throughout one's life, made his developmental theory relevant to studying teachers as adult learners.

His theory ascribes a central place to educational activity as a framework that is geared to evoke cognitive change (Kozulin, 2004). In science education, researchers have been influenced by his notions of cognitive change (*ibid*), for example in relating to pupil misconceptions (Vosniadu, 1994, in *ibid*) or theories relating to conceptual change and conceptual conflicts (Posner et al, 1982). From my personal experience, these various theories provide productive ways to foster and understand the mental development of pupils (Margolin, 1998) and teachers as demonstrated in this study.

Only in the 1960s, when Vygotsky's work *Thought and Language* (1934) was translated into English (1962), was the West exposed to a theory that Bruner (in his introduction to the work, 1962) describes as especially rich and original. The term 'socio-cultural' will be used in this thesis with reference to Vygotsky's approach, although he originally related to it as socio-historical (Wertsch, Rio and Alvarez, 1995). In addition, reference will also be made to his expanded work (mainly to CHAT – Cultural Historical Activity Theory). According to Wertsch, Rio and Alvarez (*ibid*), this term has been used by different authors, among whom was Dewey, whose work *Democracy and Education* (1916) was of particular inspiration for this thesis. His approach to learning and teaching coincides with Vygotsky's ideas, as they both refer to learning as the most important human coping strategy in

a complex dynamic environment. Philosophical and pragmatic aspects in Dewey's work (1916), as well as Vygotsky's, deal with a learning environment where participants are actively involved in reciprocal learning interactions which transform both the participants and their environment. This approach was relevant for this thesis in which teacher empowerment and their learning environment are viewed as parts of one whole.

2.1.1.2 The need for an integrative approach to teaching, learning and development

Further tensions exist among different constructivist approaches. Murphy (1999, p. ix), for example, denotes the clash of cultures evoked since the 1990s by two theoretical traditions: 'situated cognition' and 'symbolic cognition'. The former – situated cognition – views learning as a process where individuals engage in activity and where the environment structures, constrains and guides their cognition (Lave and Wenger, 1999). The latter – symbolic cognition – focuses on the individual's internal mental processing and symbolic representation of the mind in understanding learning and the way in which it transforms behaviour. The situated approach, which is supported by current psychological studies of human developmental processes (Bredo, 1999; Freedheim and Weiner, 2003), raises the need for:

> Shifting the focus from individual *in* environment to individual *and* environment…the boundaries of a cognitive system are no longer limited to a person's brain, head, or body, but include aspects of the environment as well. (Bredo, 1999, p. 34)

Bredo (*ibid*) reminds us that Dewey (1916) had already pointed out the tension derived from theoretical approaches that accent one-sided positions, when:

> …some educational approaches emphasised the external demands of the curriculum, others the inner needs of the child…some placed their emphasis on the content to be taught… some gave priority to the social world and the humanities, others gave it to the world of nature and sciences. (Bredo, 1999, p. 25)

In reference to the above, using the encompassing aspects of Vygotsky's (1962, 1978) theory, I was able to view both perspectives as part of one complex whole (Vygotsky, 1962). However, Vygotsky's productive formula for understanding the unique mode of human development, useful as it was, required elaboration, as Kozulin (1999, p. 6) stresses:

> After all, <u>Vygotsky only sketched out a theory</u> of cultural psychology, and it is our task to develop it into a viable intellectual perspective. (Emphasis added)

While his perspective of human action as culturally mediated overcame the split between the Cartesian individual (where mind and body are separate entities) and the untouchable societal structure, its unit of analysis remained focused on the individual (Engeström, 2001). This explains the integration of Engeström's model (1987, 1999) of a collective learning activity through this study. His model expanded Vygotsky's work and afforded additional concepts through which to frame collaborative learning processes.

The integration of Senge's (1990) notions of 'the learning organisation' in this thesis with Engeström's model (1987, 1999), was particularly helpful. These models illuminated aspects of teacher learning at the macro level. Senge's work provided relevant perspectives from which to make sense of the learning dynamic in the school organisation. Its compatibility with the socio-cultural perspectives of this thesis added coherency to its conceptual framework (Figure 2.1), yielding a multifocal lens with which to study individual and collective learning processes.

In order to fit the complexity involved in the exploration of teacher development, additional theories of conceptual change (Posner et al, 1982) and metacognition (Flavell, 1976, 1981) were also incorporated into the conceptual framework of this study. These assisted me when inquiring into micro levels of developmental process (an individual's cognition).

Conceptual integration receives support from the work of numerous scholars (e.g. Wertsch, 1995; Mercer, 1995; Cobb, 1999; Desforges, 2001, Parke and Clarke-Stewart, 2003; Ogawa et al., 2006). Moreover, it mirrors psychological approaches of the current era, 'characterized as eclectic in terms of theoretical models, developmental assumptions, and methodological approaches'. (Parke and Clarke-Stewart, 2003, p. 215)

Similarly, Illiris's adult learning model (2003), responds to the need to revise and integrate traditional learning theories. His model attempts to integrate between the cognitive, the emotional and the social dimension, which he refers to as the 'tension field' of learning. He offers a path through which to observe and analyse learning from three different approaches; cognitive psychology (mainly drawing on Piaget's work), psychology of personality (the work of Freud) and socio-cultural approaches (drawing on sociologist Oskar Negt and Marx's theory of societal change). Illiris's (*ibid*) work provides a wide range of instances showing the effect of emotions (resistance, defence) on cognitive processes, as well as the distinctive role of social interactions on the quality of learning.

Nevertheless, Illiris's (ibid) work lacks several elements that Vygotsky's theory (1962, 1978) provides in understanding learning and developmental processes as considered in this study. One is the lack of explicit reference to the cultural dimension of learning (cultural artefact). Second is the absence of an articulated mechanism that helps us understand the relationships among the different dimensions and how they are bound into a coherent whole. Moreover, Illiris (ibid) draws mainly on Piagetian perspectives when referring to the cognitive dimension of learning. This approach, as discussed earlier (section 2.1.1), may be viewed as conservative and restraining for understanding the dynamic of learning in a social context (Ratner, 2004). In the following sections I will elaborate on these issues, and the concept of 'mediation', in particular, which is a key concept in Vygotsky's work (1962, 1978) and central for understanding learning and developmental processes that lead to teacher empowerment.

Socio-cultural approach – An overarching conceptual framework for teacher empowerment

Intuitive thinking
Higher order thinking
External /Internal Speech
Metacognitive knowledge
Self-regulated learning
Internalization
Conceptualization
Conceptual change

Reflective discourse
Collective learning
Multiple ZPD interactions
Negotiating meanings

COGNITIVE MEDIATION

SOCIAL MEDIATION

School as a learning organisation

Mentoring multiple ZPDs interactions towards teacher empowerment

Teacher Learning

CULTURAL MEDIATION

EMOTIONAL MEDIATION

Learning organisation
School-meta language
Mentoring model

Negative feelings: pressure, stress, frustration, sense of failure, humiliation, guilt

Positive feelings: Support mutual respect, trust, confidence, sense of efficacy, empowerment

Figure 2.1: **Integrative Approach to Learning and Empowerment**

Wertsch (1995, p. 56) emphasizes the significance of the integrative approach as applied in this study towards the empowerment of teachers:

> The goal of socio-cultural research is to understand the relationship between human mental functioning on the one hand, and cultural historical and institutional settings, on the other. In a world characterised by rapid political transitions, and many other forms of potentially positive, but often deadly change... socio-cultural research has never been more timely. It represents one of the ways that psychology, anthropology, education, and related disciplines can take a next step in entering into public discourse.

Consequently, I employed Vygotsky's (1962, 1978) theory, as an overarching conceptual framework, facilitating the integration of various perspectives on teaching and learning. The next section will present this conceptual framework with other amplifying perspectives woven in.

2.2 Vygotsky's Approach - an Overarching Framework for Teaching, Learning and Knowledge Development

Vygotsky (1962, 1978), the founder of socio-cultural learning theories, together with his colleagues Leontiev and Luria, developed a multi-dimensional theory of teaching, learning and knowledge development. Its power lies in how it explains the dynamic interdependence between the social world and the individual's learning and developmental processes (John-Steiner and Mahn, 1996). Vygotsky drew attention to some features, often ignored by psychological theorists, which are important in the process of human mental development and the construction of knowledge (Bruner, 1990; Mercer, 1995; Stetsenko and Arievitch, 2002):

1. Learning and teaching interactions are the very pathway through which the thinking human mind develops.

2. A person's learning ability can be enhanced by providing the right kind of cognitive support and encouragement.

Likewise, the role of education is not in the passive acquisition of knowledge and rules through existing psychological functions, but rather in learning that generates new mental functions.

A few aspects of Vygotsky's (1978) constructivist approach to learning and development are incompatible with theories such as Piaget's, where 'maturation is viewed as a precondition of learning but never the result of it' (*ibid*, p. 80). Rogoff (1999) highlights additional areas of contention between these two influential theorists, though both agreed on the importance of sharing perspectives. She asserts that Piaget viewed cognitive development as the individual's product, 'sparked by having to account for differences in perspectives with others' (p.81). For Piaget, social impact is in the background, providing the information through which individuals become aware of competing concepts. This awareness is assumed to trigger conceptual conflict which can lead to conceptual change (Posner et al, 1982; Hewson, 1992). However, Vygotsky's perspective is that the individual's involvement in joint decision-making processes makes use of collective perspectives and cultural artefacts (Rogoff, 1999) which provide the foundation for mental development. Therefore, the unit of analysis shifts in the Vygotskian approach from individual mental activity to social activity that fosters mental development.

In this thesis however, these two theoretical perspectives were not viewed as mutually exclusive. Both were useful for exploring and assessing progress in different contexts that reciprocally interact with one another. These perspectives found expression in data collection at the level of the individual (e.g. members of the school staff) as well as the level of the organisation (e.g. school staff, subject matter teams).

Similarly, theoretical and methodological aspects interact in Vygotsky's (1962, 1978) work. His approach is consistent with Dewey's (1916) suggestions of placing theory within practice and involving transactions between the individual and the environment. It challenges the dualism involved in the separation between the individual and the group, where processes of thinking, learning and development are viewed as separate entities (Bredo, 1999). 'Mediation' is a central concept in Vygotsky's work, through which synthesis between such dichotomies evolves, instead of seeming opposites. I will focus on this central concept and its relation to learning and knowledge development in the next sub-section.

2.2.1 Learning and development – Mediated processes within the learner's Zone of Proximal Development (ZPD)

The concept of the 'zone of proximal development' (ZPD, Figure 2.3) was presented by Vygotsky (1978) in the 1930s during heated debates in the field of education in relation to the study of learning and the development of knowledge (Zellermayer, 2004). This alternative perspective shifted the focus from the dichotomy of studying 'learning' separately from 'teaching' to 'teaching and learning' within the learner's zone of proximal development (Mercer, 1995, p. 4). Vygotsky (1978) defines this zone (ZPD) as:

> ...the distance between the actual developmental level as determined through independent problem-solving and the level of potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers (1978, p. 86).

The ZPD concept encompasses Vygotsky's dialectical method, which involves 'the interrelatedness of diverse elements and the integration of opposites that creates unity within dialectics" (Falmagne, 1995, p. 207 cited by John-Steiner and Mahn, 1996). Accordingly, teaching and learning within learners' ZPD are a unified process which involves meanings negotiation yields cognitive change (as new meanings, perspectives).

Mediation is a key concept for understanding the ZPD notion. It refers to any intervention that fosters interrelatedness between opposites. Wertsch (1994) claims that mediation has a central role in the basic formulation of Vygotsky's socio-cultural approach:

> [It] is the key in his approach to understanding how human mental functioning is tied to cultural, institutional, and historical settings since these settings shape and provide the cultural tools that are mastered by individuals to form this functioning. In this approach, the meditational means are what might be termed the 'carriers' of socio-cultural patterns and knowledge. (p. 204)

The underlying premise of such an approach is that 'humans have access to the world only indirectly, or mediately, rather than directly, or immediately.' (Wertsch, del Rio and Alvarez, 1995, p. 21) Engeström's (2001) theory of *expansive learning* and his unit of analysis are congruent with Vygotsky's (1978) triangular model (Figure 2.2 A); where mediation (X) creates an indirect connection between stimulus (S) and response (R). This model transcended to the context of a collective activity by notions commonly expressed as the triad of subject, object, and mediating artefact (Figure 2.2 B). The collective *subject* refers to an individual or subgroup (such as the teacher or organisation in this study). The *object* of the activity refers to the problem space toward which the activity is directed and which is transformed into learning *outcomes* with the assistance of external and internal *mediating tools* (external, such as rubrics, discourse and internal, such as the individual's conceptualisation or emotion).

A   B

Mediating artifact

S •┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄• R

Subject

Figure 2.2: Vygotsky's model of a mediated act (A) and its common reformulation (B) (adopted from Engeström, 2001, p. 134**).**
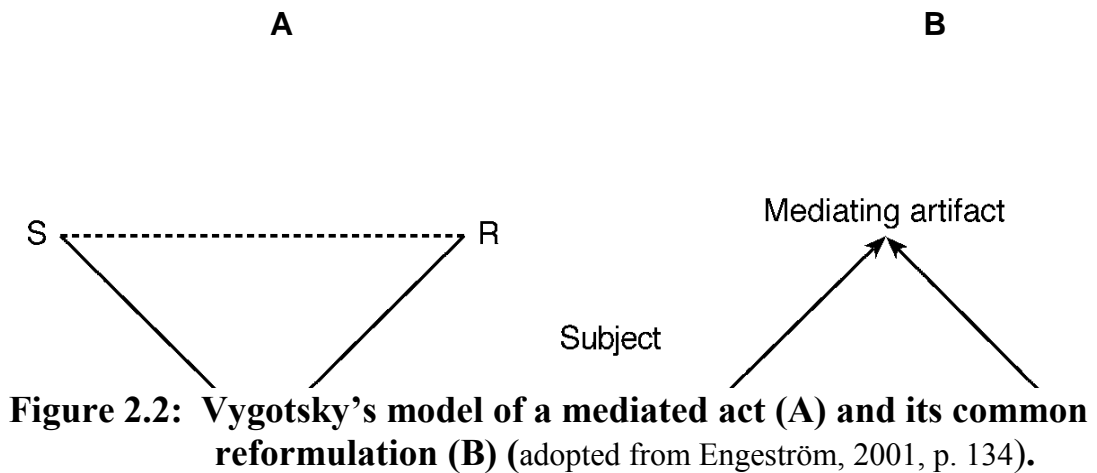
Mediation is thus an active process which shapes actions and has 'transformatory capacities' (Wertsch, del Rio and Alvarez, 1995, p. 23).   Through social interactions, individuals internalise the use of cultural tools such as language, procedures or didactic tools. Rogoff (1995) and Wertsch (1998) accent the adaptive nature of such internalisation, to which they refer as 'appropriation'.   While 'internalisation' as 'mastery' means knowing how to use certain tools in a particular practice 'appropriation' refers to the adaptation by individuals of cultural tools that fit to their own use.

Furthermore, due to this capacity, meditational means are incorporated into action in unanticipated ways, crossing boundaries, causing 'spin-off' effects (*ibid*, p. 25) or turning points (in Engeström's model, 1999). Accordingly, human action, including mental activity, involves complex dynamic interactions rather than an 'ideal design'. (Wertsch, del Rio and Alvarez, 1995, p. 26)

Four mediation levels are involved in the process of higher mental development: cognitive, emotional, social and cultural, which interact reciprocally and transform each other (Vygotsky, 1962, 1978; Ratner 1998, 2007, 2008; John-Steiner and Mahn, 1996, Mahn and John-Steiner, 2002; Wertsch, 1994, 1998; Stetsenko and Arievitch 2002; Kozulin, 2004).   The orchestration of all four took place in this thesis (Table 2.1). They form the basis of its overarching theoretical framework. In

addition, they are involved in mediating learning and teaching processes within the learner's zone of proximal development, to which I will now turn.

Table 2.1: **Mediation levels involved in teaching, learning and development within the learner's zone of proximal development**

Cultural Mediation	**Cultural** tools (macro-cultural tools, products of society – tools and abstract symbols such as words, rubrics, modules, books, research and institutions) are situated in a social context and interact with the learning process.
Social Mediation	Cultural tools are mediated through **social** interactions and relationships within a discourse space[vii] of active interaction and co-operation in the learner's zone of proximal development: the teacher/mentor or other experienced person mediates the developmental processes, enabling learners to perform a task they could not previously carry out alone.
Cognitive Mediation	**Cognitive** development progresses through active learning interactions with cultural tools. These processes yield a transformation that occurs through internalisation (appropriation) processes, creating the building blocks (mental models) of the mind. Learning is a developmental process, transcending lower mental functioning (biological roots) to higher ones (higher-order thinking) which has social and cultural roots.
Emotional Mediation	**Emotions** (feelings that accompany thinking) intertwine with cognitive processes, influence and are influenced by the formation of higher mental operations.

The ZPD concept received a boost from Bruner (1978, in Mercer, 1995) who was greatly influenced by Vygotsky's work (Bruner, 1996). Following Vygotsky, he coined the concept 'scaffolding' as a metaphor that shows how a more competent person (teacher/parent/more experienced peer) as a mediator of learning provides learners with appropriate mediating tasks that challenge their thinking and at the same time is not beyond their comprehension. Mercer (1995) finds this concept

attractive for both psychology and education, since it offers an explicit tool for conceptualising the active and sensitive dynamics involved in the instructor's role within the zone of proximal development.

I found Bateson's (1972) approach to the interaction between individuals and the environment useful for highlighting the dynamic of learning within the learner's ZPD. His view, as derived from a systems approach (on which I will further elaborate in Sub-section 2.4.1), describes the change yielded through the interaction between individuals and their environment as 'a difference which makes a difference' (*ibid*, p. 381). Accordingly, information presented to an individual will make a difference (a change) in their knowledge depending on the gap (the difference) between the new level of conceptualisation required and the individual's existing one. Vygotsky (1978) suggests bridging such a gap by offering learners mediation within their ZPD – mediation with appropriate scaffolding that challenges learners to cope with a new task which is slightly beyond their current knowledge/competency.

In addition, the ZPD notion was compatible with my mentoring approach, where learning is perceived as a mutual developmental act taking place between mentor and teachers. The ZPD concept attributes a major role to teachers in fostering pupil thinking. Moreover, accenting the notion that mental development can be mediated through appropriate assistance encourages teachers to believe that pupil success in learning is possible when providing appropriate scaffolding. In an era where the development of the mind toward learning is viewed as the essence of education (Wells and Claxton, 2002), this concept becomes more relevant than ever.

Levels of Mediation
within the learner's **ZPD**

Current
Competency

Expected
Competency

Cultural mediation (tools, abstract symbols)
Emotional mediation (support, encouragement)
Social mediation (reflective dialogue)
Cognitive mediation (mental models, concepts)

Zone   of   **P**roximal   **D**evelopment
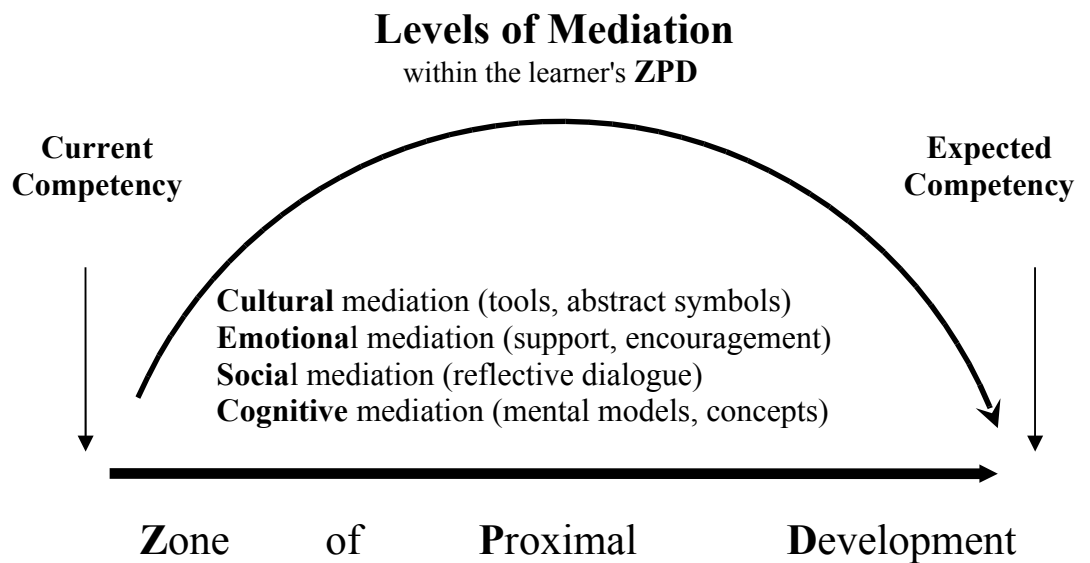
Figure 2.3:   **Mediation of thinking/learning processes within the**
learner's ZPD (Based on Vygotsky, 1962,1978)

The following sub-sections will explicitly present each of these levels of mediation, which constantly interact with and transform one other.

2.2.1.1 The cognitive level of mediation

The term higher mental functioning, or psychological phenomena (Vygotsky, 1962, 1978), relates in this work to cognitive development. It is congruent with 'thinking skills' and follows Resnick's suggestion (1987) that learning activities be addressed

that involve different types of higher-order thinking skills. These include three of the highest level skills in the Bloom taxonomy: analysis, synthesis, and evaluation. Metacognition (Flavell, 1976, Brown, 1978) is another concept which corresponds with higher-order thinking skills and indicates mental growth (to which I will turn later).

According to Vygotsky (1978), higher mental skills are task-specific, learned and developed in social-cultural contexts, and are not an inherent part of human biological qualities. He views the development of higher mental functions as human cognitive tools that mediate and regulate our behaviour. He goes so far as to define these interrelations as the 'law of the development and structure of higher mental functions' (Ratner, 2004). This development is described as the result of two qualitatively different processes: the fundamental process that originates in biology and connects to elementary structures (lower processes of thinking) and the process by which higher psychological functions evolve (John-Steiner and Souberman, 1978; Ratner, 2004). Rather than lower and higher processes forming a continuum in which the biological elements affect the higher ones, Vygotzky (1978) speaks of a radical dichotomy in which higher functions have total autonomy in human mental development. Nonetheless, as higher functions evolve they interact reciprocally, creating a bootstrap effect (a term I borrowed from Edelman's description of neural activity involved in higher mental processes, cited in Sacks, 1999), where lower cognitive functions interact with higher ones, transforming them both (Ratner, 200(0. Likewise, basic abilities such as remembering or directing attention (lower, natural abilities) can be mediated through mental interactions (cognitive mediation) to levels where we are able to remember more and focus our attention better than we did before.

These perspectives of mental growth are reinforced by current studies in neuroscience. Edelman's model (1992, in Sacks, 1999) stresses that learning, which transcends thinking to higher levels of consciousness, is not just a process of control and corrections of errors. It is rather a mechanism that can generate innovation (*ibid*). In this context, Ratner (1998) confronts perspectives found ubiquitously in

the psychological literature, whereby psychological functions are attributed completely to biological mechanisms.

In this thesis, cognitive mediation is viewed as the mechanism responsible for the construction of new meanings as well as modifying existing ones. It involves several levels of thinking processes.

a. Metacognition

Metacognition merged in this thesis with Vygotsky's perspectives of higher mental functioning, expanding the meaning of mediating developmental processes within each teacher's ZPD. According to Flavell, 1976 and Brown (1978), metacognition is concerned with awareness of cognitive acts of thinking – "Any knowledge or cognition that takes as its object, or that regulates any aspect of, any cognitive endeavour" (Flavell, 1981, p. 37). It relates to knowledge about learning and about oneself as a learner, and the skills of planning, monitoring and regulating one's own cognitive processes (Flavell, 1976, 1981; Brown, 1978). Ann Brown (1978) emphasises the regulation and control aspects of metacognition. She perceives self-interrogation and introspection as crucial to monitoring and regulating thinking processes. A recent definition describes metacognition as:

> One's knowledge and beliefs about one's own cognitive processes and one's resulting attempts to regulate those cognitive processes to maximize learning and memory" (Ormrod, 2006, cited by Stewart, Cooper and Moulding, 2007).

Moderating beliefs about knowledge is viewed by Fosnot (1996) as an essential aspect of educational change:

> If there is a key to reinventing our educational system, it lies in what our teachers believe about the nature of knowing. Without a re-examination and change in beliefs about the nature of knowing, there will be no substantial change in the enterprise of education; we will stay in a vicious cycle. (p. 202)

Much of the research on metacognition has been focused on young children, while metacognitive skills are tacitly assumed to be fully developed by adulthood (Stewart, Cooper and Moulding, 2007). However, there is much evidence suggesting that metacognitive awareness (self–appraisal) and self management skills (executive control of cognition) (Brown, 1978), continue to develop in this later stage of life (e.g. Imel, 2002; Baker, 1989, in Stewart, Cooper and Moulding, 2007; Cubukcu, 2008). Imel (2002), points out though that literature on metacognitive skills in adult learning relates mostly to the area of self-management skills.

These notions were particularly relevant for this thesis, as my premise was that teachers need to deliberately regulate their own metacognitive development (knowledge and skills), and to develop awareness of the nature of knowledge and skills development in order to mediate their pupils' higher-order thinking skills.

Similarly, Sternberg (1998, in Imel, 2002) asserts that teachers who are aware of their own metacognitive functioning tend to play a more significant role in helping learners develop skills in metacognition. Moreover, in their review, Leat and Lin (2003) point to strategies for enhancing learner metacognition which are particularly compatible with Vygotsky's concept of the zone of proximal development. These strategies provide scaffoldings which are most effective when placed just beyond the learner's current level of independent functioning. Accordingly, over the past decades, there have been two main approaches for teaching metacognitive monitoring skills (Lin, Schwartz and Hatano, 2005): strategy training and the creation of social environments that support reflective discourse.

Kayashima and Inaba (2003) recognize that a lack of common vocabulary exists when addressing metacognitive skills, since metacognition itself is a cognitive skill. They suggest a hierarchy (Figure 2.4) which distinguishes between different skills as well as a definition for differentiating between cognitive and metacognitive skills

– cognitive skills are involved in solving a specific problem while metacognitive ones are those used to control and monitor this activity.
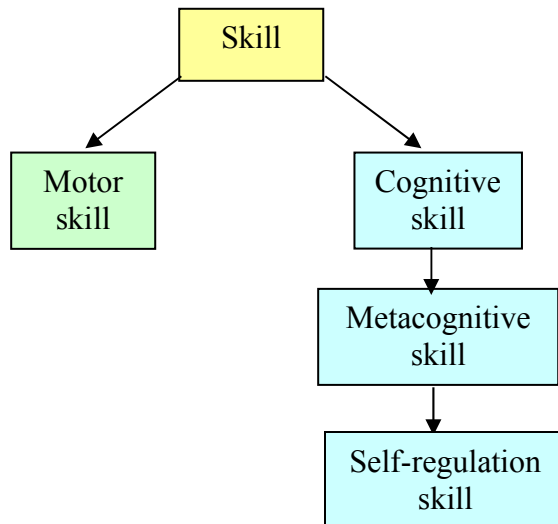
Figure 2.4: Hierarchy of Skills (based on Kayashima and Inaba, 2003**)**

b. Metacognition and self-regulation

The term self-regulation or self-regulated learning became popular in the 1980s because it emphasised notions of student autonomy and the responsibility of the student for taking charge of his/her own learning (Paris and Winograd, 2001).

A review of the literature points at various psychological theories which have focused on the area of self-regulation (Zimmerman and Schunk, 1989; Boekaerts, Pintrich and Zeidner, 2000; Pintrich, 2000; Paris and Winograd, 2001). They have all attempted to explain and describe how learners might advance their achievement level while receiving guidance and proactive supervision of their academic learning, despite their cognitive limitations. Zimmerman and Schunk (1989) present three aspects common to various learning theories in their definitions of self-regulation:

1. Self-regulation requires purposeful use (goal-orientation) of processes and strategies that learners apply toward improving their academic achievement. In all definitions, it is assumed that learners are aware of the potential usefulness of the self-regulation process.

2. Self-regulation is viewed as a cyclical process, a self-oriented feedback loop, in which learners monitor the effectiveness of their methods and strategies. Such responses vary from <u>covert</u> changes in self-perception to <u>overt</u> changes in behaviour that are expressed in changing the learning strategy.

3. Most definitions describe how and why students choose to use a particular strategy or response.

Pintrich's work (2000) presents a synthesis of a variety of self-regulation theorists into a general model that includes four phases, which was relevant to this work. The following are the characteristics of each phase which were used in this study to mark the teachers' metacognitive growth as mediators of thinking skills (detailed description in *ibid*, p. 454):

1. **Forethought, planning and activation** – Goal-oriented planning; activation of prior knowledge; metacognitive knowledge (awareness to task difficulties); planning for self-observation of behaviour; involvement of self-efficacy and personal interest (motivational beliefs).

2. **Monitoring** – Awareness to cognitive and motivational (emotion) monitoring; monitoring of efforts, time use and help needed; monitoring changing task and context conditions.

3. **Control** – Selection and adaptation of cognitive learning/thinking strategies; selection and adaptation of strategies for managing motivation; increase/decrease efforts; change or renegotiate tasks; change or leave context (parallel to proactivity, creativity level of knowledge in application in Kolb's learning cycle, see Figure 3.5).

4. **Reaction and reflection** – Application of cognitive judgement; evaluation of task and context; affective reactions; choosing reaction.

According to Pintrich (*ibid)*, these phases are not linear or hierarchically structured; they can occur simultaneously and dynamically interact with each other. Moreover, each of these skills refers to interactions between personal and situational factors (such as other collaborators (teachers, mentor, pupils) and various task products that demand thinking/learning skills).

In the context of this study, situational factors were appropriated by me to include interactions between cognitive and emotional mediating factors of individuals and social/cultural environmental interactions. The latter involves the impact of teamwork and the role of cultural artefacts (Ratner, 1998, 2007). Language was a central scaffolding for metacognitive growth, and paved the way toward dialogical learning.

Moreover, self-regulation is characterised by skilled learners mirroring qualifications ascribed to experts (Ericsson, 1996). They are manifestations of personal growth echoing Vygotsky's (1962) perspectives on mental growth, where individuals gain control over themselves and over their environment, by which impulsive, reactive behaviour is restrained (Ratner, 2007). Such development enables individuals to direct their acts proactively toward the achievement of desired goals.

Characteristics of metacognition and self-regulation correspond with Resnick's higher-order thinking (1987), as the latter similarly involves judgment and interpretation: when analyzing and criticizing multiple solutions, each has its own benefits and costs. As in self-regulation, it reflects the ability to reach conclusions based on sound judgement or inference. These processes involve complex and non-algorithmic thinking. They indicate the ability to cope with uncertainties, as the path of action for reaching a certain goal cannot be fully specified in advance. The evaluation processes referred to by Resnick's higher-order thinking or Pintrich's model (2000) for self-regulation both deal with the application of various and sometimes conflicting criteria. Such higher-order thinking requires the structuring by the learner of apparent disorder, which involves abstractions and discovering the

essential principles of things. Vygotsky's (1962) theory refers to these processes through the construction of concepts, to which I will refer later when describing the cultural aspect of mediation.

These characteristics find expression in this study in the level of teacher metacognitive development. The concept of metacognitive knowledge and skills as self-regulation will be further elaborated on in Section 2.3 in reference to teacher empowerment, as it constitutes one of the main dimensions of teacher professional growth in this study.

Another aspect of thinking which characterizes teacher practice and which accompanied their growth in this study was the intuitive mode, which is discussed in the next sub-section.

c.   Intuitive thinking and metacognition

Intuition is another kind of knowledge (Furlong, 2000), which is frequently used as a synonym for 'tacit' knowledge, or implicit knowledge:

> Professionals often speak of "learning by doing", "using professional instinct" or "intuition". Social scientists use the concepts "implicit learning" and "tacit knowledge" to describe these activities that are part of professional practice. (Horvath 1999, cited by Blow, 2005, p. 7)

Bruner (1960) describes intuitive thinking as arriving at a solution of a problem with little, if any, awareness of the process by which it was reached: 'Intuition implies the act of grasping the meaning, significance or structure of a problem or situation without explicit reliance on the analytic apparatus of one's craft.' (*ibid*, p. 60)

Educational institutions do not value the development of intuitive understanding as a product of education (Bruner, 1960; Lieberman, 2000; Atkinson and Claxton,

2000). However, recent studies in education and neuroscience show that intuition has a significant impact on an individual's ability to solve problems and develop confidence in one's own judgement (Atkinson, L. 2000; C Betsch, 2007; T Betsch, 2007). This ability is particularly essential for coping with a dynamic, unpredictable environment:

> …the role of intuition is to condense – again in a global compact manner – an analytic solution previously obtained…to prepare action. That final concentrated interpretation is destined to make the solution directly useful in an active, productive, thinking process. (Fischbein, 1982, p. 12)

The use of accumulated knowledge in intuition represents 'practical wisdom' (Smith, 1996, cited by Furlong, 2000) or other ways of knowing, such as 'feelings, hunches, ways of recognizing complex patterns' (*ibid*, p. 28). For Dewey too, these are:

> "Feelings" [that] have an efficiency of operation which it is impossible for thought to match. Even our most highly intellectualized operations depend upon them as a "fringe" by which to guide our inferential movements. (1925, cited by Lieberman, 2000)

Intuitive thinking provides a sense of the structure of the whole (Claxton, 2000; Johnson, 2000), as it 'involves reframing or reconceptualising the situation' (Claxton, 2000, p. 41). For Senge (1990) these are ingredients of systems thinking and creativity, which bring us to notions that connect intuition to cognition: as intuitive thinking and knowledge involve '…physical, environmental and emotional sensitivity [which are] valid ways of knowing... [that] do not subvert rational thought but complement it' (*ibid*, p. 47). Thus, although conscious, rational thinking is commonly accepted as a way to cope successfully with problem solving, it is often intuition (implicit knowledge) which yields unconventional solutions; it is able to reorganise the unconscious, the taken for granted perceptions of the problem 'which had been effectively blocking a solution'. (*ibid, p.* 41*)*

In the book *The Intuitive Practitioner*, Atkinson and Claxton (2000) concentrate on *'the value of not knowing what one is doing'* (book subtitle). They introduce

intuition as 'the bedrock on which all other ways of knowing are constructed' (*ibid*, p. 48). This notion links intuition with cognition while intuition has often been linked only to emotions (Lieberman, 2000). Recent brain studies undermine this dichotomy and suggest a model where intuition, implicit and explicit learning 'are linked together in circuits such that they process the same information, in any given circuit, but contribute different functions to the informational product' (*ibid*, p. 126).

Congruent with these notions of interconnectedness, is L. Atkinson's (2000, p. 61) claim that confidence in one's own judgement that derives from intuitive enactments, correlates with the individual's sense of efficacy. Her stance, based on Eccles (1993, *ibid*) definition of this concept: 'Perceptions of one's abilities' of the probability of success.' As the concept of self-efficacy correlates with empowerment (Short and Rinehart, 1992), as well as self-regulation (Bandura, 1986), it implies possible relationships between intuitive and metacognitive modes of thinking.

Together with the advantages of intuitive thinking, Eraut (1984, cited by Blow, 2005, p. 9) warns that '…reliance on unconscious competence may blind us to new information or skill acquisition and the result may be unconscious incompetence.' Moreover, several studies relating to teaching literacy skills (e.g. Johnson, 2000) point out that teacher intuitive judgement needs to be more explicit in order to provide pupils with support and guidance. Furthermore, Eraut (2000, p 266) points to the paradox behind the 'hyper-rational' thoughts of policymakers as reflecting their own irrational and intuitive feelings when they erroneously continue to search for authoritative solutions for coping with the complex nature of teacher professional development.

d.   Reflectivity and metacognition

The role of 'reflection' as a concept that connects with teachers' professional knowledge has been addressed and defined in many ways (Furlong, 2000). In this sub-section, I intend to relate to its potential to develop metacognitive pedagogy.

According to Schön (1983, 1987), an influential contributor to this subject (Furlong, 2000), reflection is the practitioner's way of developing knowledge. He relates to reflection as an examination of practice through which 'mature professionals can be helped to renew themselves so as to avoid 'burnout'…build their repertoires of skills and understanding on a continuing basis' (Schön, 1987, p. 15). Practitioner knowledge is viewed as embedded in the performance of 'unusually competent… artistry…' (*ibid*, p. 13) He contrasts this with modern research as 'technical rationality': an outcome of research-based theory and technique, important though occupying a limited territory, as it is often divorced from practitioner needs. Schön's (1983) presentation of practitioner knowledge relates to intuition, implicit knowledge and its value for practitioner wisdom. His threefold definition of practitioner research-based knowledge is 'knowing-in-action', 'reflection-in-action' and 'reflection-on-action'. 'Knowing-in-action' is a stage embedded in the act of doing, where professional practice is entirely intuitive. 'Reflection-in-action' is the stage where we consciously observe our actions in the midst of doing, while 'reflection-on-action' is enacted after the event. Explicitness in thinking and interpretations of past experience are involved in these latter two stages.

While Schön seems to give intuition a central place in practitioner knowledge, accenting reflection makes it more a theory of metacognition (Eraut, 2000; Furlong, 2000) as it involves 'consciousness or explicitness in thinking' (Furlong, 2000, p. 22). Atkinson, T. (2000, p. 71) argues that reflection can 'lead to better understanding but not necessary to better practice'. Thus, his suggestion (*ibid*, p. 73), supported by Eraut (2000), is to use reflection 'as a framework for the development of intuitive insight ' (*ibid*).

Paris and Winograd (2001) claim that most definitions of reflective practice refer to 'the teacher's ability to engage in active, persistent analysis of his or her beliefs and knowledge and the consequences that follow from those beliefs and knowledge.' They maintain that self-regulating learning can offer a framework through which teachers' ability to be reflective can be fostered, as it provides additional insights

into issues of teaching and learning. While effective strategies and teachers' expanded knowledge about their own thinking are crucial for sustaining their own motivation and engagement in reflective practice (*ibid*), Gilliss (1988) stresses the challenge involved in setting the stage for reflective practice in schools. She bases her arguments on the fact that school schedules do not provide teachers with time or supervisory support frequently enough to promote the type of reflective practice that Schön (1983) suggests. Moreover, reflectivity and other types of metacognitive activities that are involved in learning are far more difficult to perform than cognitive skills (Kayashima, Inaba and Mizoguchi, 2004). These difficulties are embedded in the multi-processing activity involved in regulation of one's cognitive activities; it simultaneously involves two layers of the working memory (the brain's capacity to hold facts essential for performing a specific task): the cognitive layer and the metacognitive layer (*ibid*). In addition, metacognitive thinking is usually covert and invisible. Moreover, it is difficult for learners to observe metacognitive thinking or changes occurring as a result of it (*ibid)*. These difficulties can explain why teachers find it hard to cope with the mediation of higher order thinking skills.

In this regard, Leat and Lin (2003) conclude that 'there is little practical assistance for teachers to make these concepts a reality in the classroom' (*ibid*, p. 384). Black and Williams (1998, cited by Leat and Lin, 2003) suggest bypassing these barriers to teacher growth by providing teachers with 'a variety of living examples of implementation, with whom they can identify and from whom they can both derive conviction and confidence' (*ibid*, p. 385).

Periodic appraisal and self-regulation   e.

The issue of periodic appraisal is central to metacognition (Paris and Winograd, 2001). It involves reflection on practice, which has been addressed by several theoretical models over the past century. These models are based on the cyclical nature of learning and deal with identifying and solving practical/professional problems. Different characteristics of these cycles overlap and have been woven

into the MM methodology. The most influential theories of learning cycles, in addition to Schön's model, include the following:

- Dewey's thinking cycle (1910): Feeling of difficulty, locating and defining the difficulty, recommending a possible solution, judging the significance of the recommendation.

- Kolb's learning cycle (1984): experiencing, observing, conceptualizing and planning the implementation.

- Lewin's action research (1946): Planning, acting, observing and reflecting.

Periodic appraisal involves reflection, which is cardinal for teachers and students alike, as the engine for revising one's approach. These processes are compatible with patterns of formative assessment, which serve as a feedback mechanism for learning (Black et al., 2004). Traditional assessment methods are summative, tending to be evaluative and judgmental (such as tests and final exams). Formative and diagnostic assessment accent dialogical relationships (*ibid*), which are congruent with Vygotsky's (1978) notion of teaching and learning within the learner's ZPD. The rubric tool (Andrade, 2000, 2001; Andrade and Du, 2005; Reddy, 2007; Appendix 2) that was used in this study provided teachers with the opportunity to practice formative assessment as well as diagnostic assessments (Black et al, 2004). Accordingly, it was used by the teachers in this study to check pupil performance capabilities in academic tasks (thinking/learning skills), thereby affording an assessment and dialogical tool through which to reflect on teaching and learning processes within the learner's ZPD.

2.2.1.2 The social level of mediation

Social interactions are essential for developmental processes as words/signs create a "space" between the individual's impulse and his/her reaction (Ratner 2004, in reference to Vygotsky, 1978). Mediating our responses rather than reacting directly to stimulus offers us a control mechanism over the environment and our behaviour. Thus, social mediation, such as teaching and learning interactions, is a key to

developmental processes. In addition, social interactions foster the ability to understand the intentions of others, which is important for coordinating and predicting behaviour, such as learning and teaching processes. Cultural tools are mediated to individuals through these interactions. The next sub-section will refer to cultural tools and their effect on modifying levels of communication as well as developmental processes.

2.2.1.3 The cultural level of mediation

Vygotsky (1978) makes a distinction between physical and psychological tools, both of which are essentially cultural. Psychological tools are used to mediate awareness and are essential in supporting and transforming mental functioning. Wertsch (1991) adopts Wittgenstein's metaphor of a socially provided tool kit of semiotic means. They represent the means and practices which become internalized and available for independent activity (Wertsch, 1991). Physical tools (e.g. a spoon) are directed toward the external world; psychological tools on the other hand are directed internally and are appropriated during activity. Thus, knowledge is not internalized directly, but through the use of psychological tools.

Cultural tools (artefacts) include signs, symbols, linguistic terms and instruments such as books and pencils (Ratner, 1998). The followings are two major cultural tools relevant to this study.

a.   School as macro-cultural tool

Vygotsky (1978), in regard to the relationship between learning and development, emphasises the unique role schools have in mediating the development of pupils' higher cognitive abilities. He challenged other researchers of his time and showed how they failed to make fundamental distinctions between learning outside of school and learning within the school setting. His view is that school instruction has an important role, as it can direct the development of higher-order thinking skills. Compatible with this notion, Ratner (2007) relates to schools or other institutions as macro-cultural tools, as their structures have a significant role in mediating mental development.

Accordingly, various educational and learning programmes in Israel that followed in Vygotsky's footsteps were purposely designed to enhance pupils' mental skills: for example, 'MATACH' – the Centre for Educational Technology Programmes, or Fuershtein's Instrumental Enrichment. Others promote the motto that 'Everyone is able', such as the SHAHAR Branch of the Ministry of Education. Likewise, the MM was used in this study as a cultural tool aimed at mediating teacher development. The next sub-section will refer to the relationship between language and the evolution of metacognition – higher cognitive functioning.

b.   Language and other external symbols

The present study uses the concept of higher-order thinking skills in reference to performing and mediating academic tasks. Accordingly, cognitive skills focused on two capabilities – accumulated knowledge (know-how) that enables complex problem-solving and the execution of specific literacy tasks (reading comprehension, which is concerned with analysis, synthesis and evaluation of the text, writing tasks involved written answers, paragraphs, comparison and the construction of thinking maps). Language as a major psychological tool (Vygotsky, 1962) and other external symbols (such as rubrics and diagrams) were applied in this study by teachers in order to mediate pupil interactions with the aforementioned tasks.

An example of such mediation is the use of a marker for indicating the central topic of a text. The external act of creating these signs leads to the construction of an internal representation, a mediating function (a mental representation) that extends our memory by an act which is within our control. This way of 'constructing the process of memorizing by forcing an external object' (Vygotsky, 1978, p. 51) is a manifestation of the expansion of biological, early natural functions (e.g. basic memory capacity) into a higher level of mental activity. Thus, in earlier forms of memory 'something is remembered; in the higher form humans remember something' (*ibid*). The latter is a deliberate act of recall, which transforms the

nature of the mental process from a reactive response to stimulus to a proactive one, where individuals direct their actions.

Language, as compared to other semiotic means (signs, symbols, visual representations), is an abstract psychological instrument and is viewed by Vygotsky (1962) as the most significant for the development of higher-order cognitive skills. It is not only a communication tool but also the mediator of conscious thought. While '[directed] thought is conscious' (Piaget, cited by Vygotsky, 1962, p. 12) and a construct of social mediation, meaning-making is a cultural construct. My basic premise in this study was therefore that, without teacher engagement in a meaningful discourse, the understanding of new generative pedagogy will not prevail.

Moreover, language has a 'multifunctional nature' (Vygotsky, 1962, p. 142). Its use as a communicational tool offers us a symbolic world – a representation of reality which transcends our biological mental abilities. Vygotsky (1962) draws a strong connection between these two functions that represent one complex whole. In the following presentation he formulates the essence of the uniqueness of human mental development:

> The primary function of **speech is communication**, social intercourse…Rational, **intentional conveying of experience** and **thought to others** requires a mediating system, the prototype of which is **human speech born of the need of intercourse during work**…human **communication** presupposes a **generalising**, attitude, which is an **advanced stage in the development of word meanings**…The **higher forms** of human intercourse are possible only because man's thought **reflects conceptualization.** (*ibid*, p. 6; 7, emphasis added)

The emphases above highlight principles that served me as a compass for understanding developmental processes in teachers. It describes the core component needed in all professional development. For me, this definition demystified the notion of teacher empowerment. It pointed out the principal relationship or relationships between meaningful and purposeful collaborative

activity and the development of mental capacities. Accordingly, an attempt was made throughout this study to create a meaningful coherent discourse. Discourse according to Coyle (1995, in Cohen, Manion and Morrison, 2000) relates to a set of linguistic materials, conversation or any written texts, through which people are enabled to collectively construct common meanings. (For a broader definition, see Sub-section 3.1.2.3)

Investing in developing language/literacy skills seems most highly valued (Wyatt-Smith and Cumming, 2003) in an era where learning has become a way of life (Wells and Claxton, 2002). Correspondingly, the MM focused on enlisting this natural resource, which is often taken for granted (Schutz, 1970; Yore, 2001).

The research field on learning provides a wide range of strategies for mediating pupil thinking in class (e.g. Rowe, 1987, 'wait time'; developing metacognitive skills in performing literacy tasks, Palincsar and Brown 1984, Brown, 1992). However, my argument, supported by various scholars (e.g. Giroux, 1986; Paris and Winograd, 2001) is that when the dynamics and procedures involved in acquiring these strategic tools are unfamiliar, teachers are often left with a vague concept of how to use them. In the absence of awareness and opportunities to develop self-regulation of their own thinking, teachers are unable to fully benefit from such well-designed instructional tools that are needed for successful learning. New scientific concepts addressed by educational reforms when removed from meaning negotiation processes are translated into changing the gimmicks used in the classroom rather than in changing the ways teachers think about teaching and learning (Lester and Onore, 1990). Therefore, as Vygotsky (1962, p. 5) stresses, when concepts are removed from meaningful negotiation, they lack the potential to trigger change, representing words with 'an empty sound, no longer a part in human speech'.

Consequently, a concerted attempt was made in this study to assist teachers in developing new conceptualisations of pedagogy which foster skilled learners. Clarifying these processes is essential for understanding the dynamic involved in

mentoring and assessing the teachers' developmental processes in this study. The following processes explain how language, as a macro-cultural tool (Ratner, 2007), mediates the development of self-regulation and new conceptualisation:

c. Developing conceptualisation through the negotiation of meaning

For Vygotsky (1962, pp. 54-55), any goal-directed activity is connected with the process of concept formation, as words are the 'means by which we direct our mental operations [and] control their course…' (ibid, p.58). In addition, he stress that the development of word meanings which evolve through generalisation 'reflect conceptualised actuality (ibid, p. 7). Thus, an increase in self-regulation involves clear goals and the development of conceptualisation that controls our thinking and actions. Similarly, developing the teachers' conceptualisation of their role as mediators assumed a relevant means for enhancing their levels of self-regulation and consequently their professional development.

Concept formation (generalisation) is mediated by words and results in the construction of bonds and relationships between scattered impressions (*ibid*). It is a dynamic intellectual process 'constantly engaged in serving communication, understanding and problem-solving' (*ibid*, p. 53). I will present general lines of concept formation which assisted me in investigating relations between the MM (e.g. rubrics construction and reflective discourse) and the teachers' metacognitive development.

Vygotsky (*ibid*, p. 76) suggests three major phases in concept formation. I will relate to two phases, the second and the third, because of their relevance to the development of abstract thinking (generalisation). The basic phase of the two is 'complex thinking', which begins with the 'unification of scattered impressions; by organising discrete elements of experience into groups', which involves **analysis** processes. While the essence of complex thinking is the production of connections, the formulation of abstract concepts, is the more advanced phase, which means 'to

single out elements, and to view the abstracted elements apart from the totality of the concrete experience in which they are embedded' (*ibid*). The abstract concept formation process involves **synthesis** as well as analytic processes. It is a dynamic complex operation where concepts 'are constantly alternating between two directions, from the particular to the general, and from the general to the particular' (*ibid*, p. 80). These developmental processes evolve through social interchange, which directs its dynamics. (*ibid*)

d.   Dialectic between spontaneous and scientific concepts

Another productive path employed in this thesis for understanding the process of developed conceptualisation (as a metacognitive growth) made use of another set of concepts suggested by Vygotsky (1962): **spontaneous concepts** and **scientific concepts**. While the former manifests learning through everyday experience (as implicit/intuitive knowledge), the latter supplies a structured, deliberate process of learning (explicit/declarative knowledge), which schools (or professional development frameworks) provide. The interrelationship between these two concepts is manifested in a dialectical relationship – 'Starting far apart, they move to meet each other' (*ibid*, p.108). This process is responsible for our metacognitive growth, where an individual's spontaneous concepts reach a certain level of experience from which scientific concepts can be absorbed. Interaction between both leads to a developmental process from spontaneous concepts 'toward consciousness and deliberate use' (*ibid*, p. 109). Similarly, reflective discourse in the MM attempted to foster teacher development from intuitive to metacognitive levels of mediation processes.

e.   Dialectic between external and internal concepts

According to Vygotsky (1978), conceptual internalisation involves dialectic between interactions that take place externally (conversations, dialogue) and those that take place internally (internal dialogue, internal speech). This notion is based on the distinction between the public/formal meaning of concepts (scientific concepts/external speech) and personal ones (internal speech and intuitive, spontaneous concepts). Accordingly, conversations between colleagues focus on

negotiating the gap between an individual's meaning (internal speech) and that of the group (external speech). Without this process, two participants who use the same concept (such as 'mediation of skill') will have different meanings. In this case:

> It is not only the deaf who cannot understand one another but any two people who give a different meaning to the same word or who hold divergent views. Vygotsky (1962, p. 141)

Utilising concepts in interpersonal communication prior to processing them into one's own concept was referenced in this study as "egocentric speech" (Vygotsky, 1978). Such speech serves learners (pupil/teacher or mentor) in regulating his/her own behaviour, as well as that of the other in the discourse (Zellermayer, 2004). Internalisation, according to Vygotsky (*ibid*), is accomplished through the intensive use of the concept which involves interpersonal interactions through shared experiences. These concepts were useful in this work to study the teachers' conceptual development and to guide meaning negotiation.

The development of self-regulated skills and metacognitive knowledge (declarative, procedural) comprised a complementary conceptual system in the research that served to identify levels of meaning and conceptualisation that the teachers constructed throughout this study.

2.2.1.5   The emotional level of mediation

Emotions have been differentiated for years from rational, cognitive thinking. Goleman (1995, p. 44) claims that cognitive scientists that have guided a 'vision of an emotionally-flat mental life' are beginning to recognise the power of emotion on thinking and learning processes. The learning culture in schools, where cognitive psychological perspectives are dominant, similarly accents rational thinking and information processing, rather than attending to the emotional side of learning. It is teacher intuitiveness that values this aspect of learning, but this aspect of their experience is not respected (Claxton, 2000). Furthermore, the pressure brought to bear from the latest educational reforms, international exams (e.g. PISA survey -

) and national exams demands that pupils' cognitive skills be promoted with no emphasis on developing their emotional ones. This leads to the teachers' greater sense of guilt; they experience additional pressure and fewer opportunities to support their pupils' emotional needs, resulting in additional feelings of failure.

Though little emphasis is put on emotions in Vygotsky's work, he himself attested to the fact that one cannot separate emotions from the process of learning. It can be assumed that his untimely death truncated this chapter of his work:

> We have in mind the relation between intellect and affect. Their separation as subjects of study is a major weakness of traditional psychology since it makes the thought process appear as an autonomous flow of "thoughts thinking themselves "(1962, p. 8).

Wells (1999, cited by Mahn and John-Steiner, 2002, p.47) asserts that 'Learning in the ZPD involves all aspects of the learner…acting, thinking and feeling.'

Reference to cognitive, social and cultural aspects are found in the works of socio-cultural researchers (e.g. Rogoff, 1999; Lave and Wenger, 1991; Wertsch, 1998; Zellermayer, 2004). My claim however, which is supported by contemporary research (e.g. Wells, 2000; Mahn and John-Steiner, 2002, Ratner, 2000, 2007) is that there is a need to pay more attention to the role of emotional mediation in learning. Hammersley (1999, p.1) supports this position and contends that sometimes teaching and learning 'are seen in overly instrumental and cognitive terms: there is neglect of the way they are embedded in the lives of both children and teachers'.

Accordingly, in the absence of explicit reference to the emotional factor within the teachers' ZPD, they might lack the confidence needed to cope with risks inherent in new and challenging learning. Teachers take the risk of exposing their lack of knowledge and skills when in the process of implementing a new pedagogical approach. This may be expressed in anxiety, a sense of insecurity or guilt when

their pupils fail to advance. This study aimed at filling the gap between the teachers' needs and the level of emotional support they receive in their school environment.

Recent studies however indicate a change in the socio-cultural movement's awareness of the emotional aspect of learning (Mahn and John-Steiner, 2002), stemming from exposure to Vygotsky's recently translated and published sixth volume of his works (*ibid*). They claim that the mediating role of emotion is, in fact, inherent in Vygotsky's concept of learning and teaching in the zone of proximal development; novices gain confidence as they expand their knowledge and skills through learning processes within their ZPD, receiving guidance and a caring relationship from a more experienced colleague (Rogoff, 1999).

2.2.1.6 Reciprocal patterns of interaction between levels of mediation

Studies based on neuroscience (e.g. Jensen, 1998; Lieberman, 2000) lend support to the conceptual framework of this thesis and were found useful for understanding the dynamic of mediated learning. The following discussion does not attempt to present a comprehensive description of brain function, as it is beyond the scope of this thesis. Rather, it aims at presenting some evidence which afforded me additional lenses through which I was able to make sense of findings that demonstrated the teachers' metacognitive development and growing sense of empowerment.

These studies indicate that brain activity in meaning-making involves reciprocal interactions between cognitive, emotional, social and cultural mediation (Jensen, 1998). Likewise, intuition, implicit learning, metacognition and emotional thinking are not divorced from one another, as they were once viewed (Lieberman, 2000).

The limbic system is the brain's centre of emotions (Goleman, 1995) and is involved in learning and memory. Emotions drive attention, create meaning and set

priorities (Jensen, 1998). The limbic system ordinarily rewards learning when the environment supports a positive and stimulating climate (*ibid*). Rewards are manifested in the release of neurotransmitters such as dopamine (Stokes, 2004). Dopamine facilitates some pleasurable sensations, which are expressed in 'alertness, self-confidence, exhilaration and euphoria' (*ibid*, p. 63). Another stimulating factor arousing learning motivation involves providing learners with a moderately challenging task which triggers a low level of emotional tension (Jensen, 1998). In addition, dopamine activity is involved in such processes as mediating problem-solving and creativity (*ibid*). Thus, learning involves cognitive as well as emotional activity in the brain. According to Goleman (1998, cited by Peters, 2004, p. 545), developing 'adaptability' relates to emotional intelligence competency which allows learners to 'relish change and find exhilaration in innovation…stay comfortable with ambiguity and remain calm in the face of the unexpected' (*ibid*). Accordingly, providing supportive learning interactions is assumed in this thesis to increase the teachers' sense of satisfaction and increase their motivation and capacity to engage in continuous learning cycles.

Other interacting levels that mediate good learning involve intuition and emotions. Recent progressive models of decision-making emphasise emotion-as-information (e.g. Damasio, 1994, in Lieberman, 2000), which guides thinking and intuition as a phenomenological and behavioural correlate of knowledge acquired through implicit learning (Lieberman, 2000). Furthermore, evidence suggests that both implicit learning (which relates to information processing) and intuition stem from the same neuroanatomical source, the basal ganglia (part of the limbic system which regulates emotions), which are involved in evaluating positive affective and emotional experience (*ibid*). Lieberman suggests that the brain frequently enacts mixed strategies which activate the cognitive substrate and might explain the various interacting processes described above.

Additional support for the reliance of individuals on various modes of thinking, suggest that the tendency of people to enact cognitive, rational, deliberate thinking or intuitive, implicit modes of problem-solving is dependent on personal or environmental factors (C. Betsch, 2007; T. Betsch, 2007). This indicates that

intuitive and deliberate, rational thinking strategies represent two separate dimensions.

For Jensen (1998), these multilevel operations, when simultaneously conducted, are manifestations of the brain's adaptation toward survival in an ever-changing environment. It can be concluded then that the brain mechanism is poorly designed for linear instruction (*ibid*). Thus, formal school education often impedes rather than facilitates learning (Wells, 2000). Against this background, the MM attempted to provide teachers with a supportive, multidimensional environment aimed at facilitating meaning-making processes which lead to their professional development. Empowerment was the concept chosen in this thesis to represent such growth.

2.3 Empowerment – a Socio-Cultural Approach to Teacher Professional Development

The Oxford Dictionary of Current English defines 'empowerment' as follows: 1. Give authority or power to. 2. Give strength and confidence to (Page and Czuba, 1999). Many studies, focusing on empowerment, consider this to be a multidisciplinary concept (e.g. Klecker and Loadman, 1998; Sadan, 2004). It is a concept shared by fields as diverse as community development, psychology, education, economics, and the study of social movements and organisations. What most of these disciplines have in common is their reference to empowerment as a process which takes place in a social context and whose main outcome is manifested in the development of skills.

Originally, the concept of empowerment had been related to approaches of community work, focusing on the place of minority groups in society such as women, blacks or the underprivileged (Sadan, 2004). These approaches consider empowerment to be a transition from a state of helplessness to one of relative control over one's life and one's environment. Empowerment, then, is oriented

toward improving the ability to control oneself as well as the ability to impose a certain measure of control on the environment.

And yet, the differences in the cultural-historical contexts of the above processes, together with the various researchers' different conceptual perspectives, results in the many meanings that are associated with this concept. The inevitable result, as Page and Czuba (1999) sum up, is the lack of a clear definition.

'Empowerment' as a concept gathered momentum with respect to teacher development in the mid-1980s, as the centrepiece of school reform for teachers in the US. (See a further review of the history of the concept in Keedy et al, 1999) Nevertheless, many teachers express loathing and cynicism towards the concept since it is not always associated with their experience in the school system. For them, it is just another idea in long line of short-lived fashions, used as an empty slogan by administrators and reformers of educational policy. Empowerment, then, for many, is a popular buzz word thrown in when new funding for old programmes is needed (Page and Czuba, 1999), or as a slogan which helps the users present themselves as knowing more than they do (Bynom, 2003).

Despite the above, my belief is that fostering teacher empowerment is a productive path for coping with challenging reforms directed at change in teacher and school patterns of work. Baruch (1998) reinforces my attitude, viewing empowerment as comprised of a shift from the control mechanism of top-down management styles, which have dominated managerial concepts since the industrial revolution (Baruch, 1998).

Thus, empowerment was defined in this study as a strategic goal aimed at coping with feelings of burnout, pressure and guilt experienced by teachers (Hargreaves, 1994, 2002). These feelings, which I have encountered throughout my experience as a mentor and as a teacher, derived from negative evaluations of the teachers' work. Imposing new demands to promote achievements according to new standards

increases pressure (Ball, 2003; Finlay et al, 2007), while appropriate conditions for teacher professional growth are not provided (Paris and Winograd, 2001).

Despite my clear-cut goal of advancing teacher empowerment, many questions emerged as to how to evaluate its attainment when there is no one accepted definition for the concept. At the same time, Zimmerman (1984) claims that asserting one single definition contradicts the very concept of empowerment. These contradicting considerations echo my own difficulty in defining empowerment.

Engeström's (1999) theory of expansive learning helped me reconcile this tension. It provided special lenses through which I was able to perceive empowerment as a single entity, rather than separate contradicting facets. His model of expansive learning presents contradictions as the main trigger for a productive learning mechanism, where engagement in multi-level learning cycles, through a collective activity, involves challenging dilemmas and paradoxes, as inherent in the process of innovative thinking. Moreover, the different perspectives of empowerment merged with socio-cultural perspectives to learning; where the cognitive, emotional, cultural, and social facets represent one complex whole (Vygotsky 1962) rather than separate entities.

The following sub-sections will present the different aspects of empowerment, which provided the base for an integrative definition of teacher empowerment.

2.3.1 Power, empowerment and power relationships

Power and empowerment are significant issues to be considered when dealing with the professional development of teachers (Eraut, 2008). As professionals, teachers must have access to power and control over their practice in order to lead innovations. Due to the closeness of these two concepts, I will focus on clarifying their relations in this thesis.

A meaningful definition of the meaning of power appropriate to the needs of this study was afforded through a perusal of various perspectives on the subject (Page and Czuba, 1999; Zenz, 2000; Sadan, 1997*)*. Page and Czuba (1999) relate to Weber's (1946: *ibid*) perspectives on power, asserting that it is created in relationships and thus, power and power relationships can change. Thus, they perceive empowerment as a process of change.

Zenz (2000), for example, used Lukes' dimensions of power and rephrased them as dimensions of empowerment. Overall, these relate to change and the development of abilities (emphasis added):

> 1. […] **to access and control** material and non-material **resources**...2. […] **to access and influence decision-making processes** […] to ensure the proper representation of one's interests […] 3. Gaining **an awareness** of dominant ideologies […] which […In addition] **enable individuals to determine their preferences independently, and act upon them.**

And he adds a forth dimension: **'personal or psychological empowerment** […] also known in the psychology literature as the concept of perceived self-efficacy (Bandura, 1995, *ibid*): To develop the **ability to trust in one's personal abilities in order to act with confidence**.'

Page and Czuba (1999) review new perspectives of 'power' which broaden the meaning of the concept beyond the common approach; that which provides people in control the access to power and subordinate others under their control ('zero-sum', *ibid*). New perspectives represent a shift from this win or lose perspective to that of collaboration, sharing and mutuality (Kreisberg, 1992 cited by Page and Czuba (1999)). I found this perspective compatible with Covey's notions (1989) where 'win-win' thinking is grounded in seeking cooperation rather than competition. This philosophical approach, where one's success should not amount to the other's failure, strengthens the power of group participants, rather than

diminishes it. It coincides with my approach to teacher empowerment in my pursuit to enhance change in their learning and teaching patterns.

Kreisberg (1992, cited by Page and Czuba, 1999), suggested that power defined as "the capacity to implement" is broad enough to allow power to mean domination, authority, influence, and shared power or "power with."

This integration of the essence of power with manifestations of growing abilities met my belief in sharing with equals. Collaborating with teachers in a collective partnership also implements Dewey's educational ideal (1916) and Vygotzky's approach to learning which takes place between teachers/mentors in the learner's ZPD. It creates teaching/learning environments where trust and mutual respect are fostered (Wells, 2000, Mahn and John-Steiner 2002). Moreover, according to Freire's (1989, p. 49) insights, these relations can be projected in teacher-pupil (or mentor-teacher) relationships, manifesting "authentic dialogue between learners and educators as equally knowing subjects."

Having said the above, it must be noted that the need by teachers for power and their need to have control in class might impair empowering processes between teachers and learners (Wyatt-Smith and Cumming, 2003; Bynom, 2003). Bynom (2003) reminds us that the teacher, as the evaluator of learning processes, is the most powerful person in the classroom.

A similar problem may arise between mentor and teachers in hierarchic and authoritative systems such as schools, where the mentor is the expert who controls the intervention programme. One such mechanism is the use of discourse that determines the participant structure: who is to speak, what may be said and who does the evaluation. In this sense, discourse is related to power. Freire (1970) emphasises aspects of disempowerment as oppression when such aspects block the way to an open, reflective discourse.

Zenz (2000) too, claims that:

> It is empowering (upward spiral) when people reflect and act, and disempowering (downward spiral) when the change agent discourages people's reflection and/or action by doing it himself, and/or when the feedback from the behavioural world hinders people's efforts.

With respect to this point, Keesing-Styles (2003, based on Freire, 1989), suggests that the educator's role is to empower learners to self-assessment. As this development is not simply acquired through experience alone, teachers/mentors need to employ processes that help their learners become proactive and self-managed learners.

2.3.2   Empowerment and socio-cultural aspects of learning

Relating to empowerment as a process corresponds with Vygotsky's (1962) view of learning. His claim is that learning can be understood only through its historical context and development. Similarly, in this study, mentor and school collaborators are engaged in processes of reciprocal learning cycles in a longitudinal study. The next sub-section will focus on presenting learning aspects of empowerment, and on the way they were intertwined in the conceptual framework of this thesis.

2.3.3   Empowerment as a collaborative enterprise

Researchers from various fields have referred to empowering interactions that exist between humans and their social environment. Rappaport (1987, p. 122) who describes the construct of empowerment as 'a joining of personal competencies and abilities to environments that provide opportunities for choice and autonomy in demonstrating those competencies'. Somech and Ron's (2007) study juxtaposed the empowerment of individuals with that of teams in an integrated model of organisational outputs (performance, organisational commitment, and professional commitment). Their emphasis gives additional support to this thesis's approach,

viewing empowerment as embedded in social interaction and leading to professional growth.

2.3.4 Empowerment as a process and outcome

Empowerment was conceived in this thesis as both a product and a process as related to learning in a social context. This perspective afforded the actualisation of human potential, that which relates, according to Vygotzky (1962), to our unique ability to free ourselves from blocking behavioural patterns and to the advancement of new abilities:

> It is an image of man that places the effort to learn and master into the centre of the stage as an instrument that frees us of earlier efforts and results. (Bruner, in the introduction to Vygotzky's book *Thought and Language*, 1962, p. ix)

Vygotzky's perspectives to learning (1978, 1962) offer a flexible framework through which to integrate various characteristics of empowerment. The common denominator that has bonded the different definitions of empowerment thus far has been that learning processes mediate human development by means of a complex array of interactions between social, cultural, cognitive and emotional factors. At the same time, empowerment is also perceived as a spiral and dynamic learning process (Zenz, 2000). The product is the development of capabilities that help people achieve control over their environment and later on, over themselves.

Another characteristic of empowerment that is parallel to learning processes in the socio-cultural approach is the reflective thinking that accompanies action (e.g.: Schön, 1983; Freire, 1989; Zenz, 2000; Katsap, 2003)

> Knowledge involves a constant unity between action and reflection upon reality [...which is...] why we must take our presence in the world as the focus of our critical analysis (Freire, 1989, p. 52).

Development then, is fostered by learning (Vygotzky, 1962) and is identified with the advancement of mediating functions (high levels of conceptualisation). These

functions make it possible for us to choose what to react to and what to ignore. These functions simultaneously manifest control acquisition, foster autonomy, and proactive behaviour and are a product of spiral learning processes (Kolb, 1984) which take place in a social context.

Likewise, Zimmerman (2000) maintains that a process is empowering if it helps people develop skills which afford independent problem-solving and decision-making. In his opinion, outcomes might include situational, specific perceived control skills and proactive behaviours.

The above features of empowerment were found to be relevant to this thesis, since fostering change in teacher knowledge was its main objective. The multi-dimensional character of empowerment was found to be compatible with other characteristics of the socio-cultural approach to learning embedded in this work:

> [...Empowerment] occurs within sociological, psychological, economic, and other dimensions. ...at various levels, such as individual, group, and community [...and] is a social process, as it occurs in relationship to others (Page and Czuba, 1999).

2.3.5 Empowerment as proactivity

Professionalism was another aspect of empowerment shared by different disciplines. It refers to the development of skills, achievement of control and proactive behaviour which manifests the freedom to choose an action (Lightfoot, 1986; Lichtenstein, McLang, and Knudsen, 1992; Short and Rinehart, 1992; Kreisberg, 1992; Klecker and Loadman, 1998; Czuba and Page, 1999; Zimmerman, 2000; Sadan, 2004; Katsap, 2003). Lightfoot (1986), for example, explains empowerment in terms of the opportunities that an individual has for power, autonomy, choice and responsibility.

Zenz (2000) stresses that complete empowerment means that 'the people would have the power to do anything they wanted'. Derry's (2004) argument accents the relation between free will and freedom of choice, proactivity and empowerment,

rather than 'people doing anything they want', as suggested by Zenz (2000). His article on *The Unity of Intellect and Will* shows how Vygotsky was inspired by Spinoza's idea of freedom. He further emphasises how, for both scholars, 'free will' did not coincide with people doing 'any thing they wanted'. For Spinoza, human beings exhibit freedom through self-determination. Being free, self-determined, is only possible when activity corresponds with adequate rather than inadequate knowledge. Humans therefore, are free to choose when guided by adequate conceptualisation rather than reacting to external causes. Therefore, the freedom to act is a projection of our levels of competency, which in turn enables us to delay immediate reactions to environmental stimuli. This notion coincides with Vygotsky's (1962) view of intellectual growth as an empowering mechanism through which we master our environment as well as control and monitor our own reactions.

O'Gorman (1995, in Zenz, 2000) also asserts that empowerment signals a transition away from traditional development in which people act as passive recipients. Instead, empowerment strategies aim to assign us an active role, to enable us to become activists for our own self-defined cause.

Short and Rinehart (1992) suggest six dimensions in their school participant empowering scale which were adapted to the categories assigned for assessing teacher empowerment in this study. These will be presented in the following sub-section.

2.3.6 Defining the dimensions of empowerment that are relevant to teacher empowerment

Two main categories for examining teacher empowerment which drew on the various aspects of empowerment presented above yielded the following framework for this thesis.

2.3.6.1 Professional development – assessing metacognitive development

Placing emphasis on teachers' knowledge of thinking processes and mediation of higher order thinking (metacognition) distinguishes the context of this study from programs that are subject-matter oriented. Thus, a unique terminology which refers to metacognitive knowledge and skills was required. Compatible with Zohar's (1999) notions, Shulman's definition (1986, in *ibid*) of teachers' professional development was found less adequate for the context of this study, as it refers to content and general pedagogic knowledge rather than metacognitive knowledge and skills.

In addition, characteristics of self-regulation were both useful, for describing advanced levels of metacognitive development (Zimmerman and Schunk, 1989; Pintrich (2000); Paris and Winograd, 2001;Cubukcu, 2008) as well as for empowerment; since acting proactively, developing competencies and control over the characteristics of empowered teachers (e.g. Short and Rinehart, 1992; Page and mediation of pupil learning processes are manifestations of self-regulation and Czuba, 1999; Zenz, 2000; Keedy et al, 1999).

The next category accents teachers' perceptions in reference to their professional growth.

2.3.6.2 Teachers perceptions – work satisfaction and sense of efficacy

This category provided an additional set of dimensions through which to assess teacher empowerment. It relates to teachers' perceptions and feelings accompanying growth in teaching competencies and the sense that their work is valued. It is compatible with indicators derived from international research which inquired into sources of teacher work satisfaction (Dinham and Scott, 2004). Feelings of work satisfaction relate in this study to expressions of happiness when fostering pupils' thinking skills. In addition, they relate to enthusiasm and

exhilaration that accompanied learning processes (Goleman, 1998, in Peters, 2004). The aspect of teacher perceptions, which is embedded in their sense of empowerment, was another indicator of their work satisfaction. Short and Rinehart (1992) addressed this issue through their 6-dimension assessment scale. Bandura's work (1986) clarifies that perceptions of capacities and the actual execution of them are linked and influence an individual's sense of efficacy. Thus, the following dimensions complemented the above system of evaluating metacognitive development, as they refer to teacher perceptions of their empowerment, based on Short and Rinehart (1992):

- Professional Growth – the teachers' perception that they are provided with opportunities to grow and develop as professionals, learn continuously and expand their own knowledge and skills.

- Status – refers to the teachers' perception that they have professional respect and admiration from colleagues. This dimension was combined in this study with the teachers' sense of satisfaction.

- Self-efficacy- – relates to the teachers' perception that they are competent in building effective teaching programs and can foster change in student learning. A guideline to understanding self-efficacy in relation to empowerment is Bandura's (1986, p. 391) definition, which accents the interrelationships between knowledge of task, the socio-cultural context and performance, whereby 'competent functioning requires both skills and a belief in self-efficacy to use them effectively'. The social context for such development is particularly essential, as learning and judgement of self-efficacy are based, among other attributes, on observation of others who model certain performance (*ibid*).

- Autonomy – relates to the teachers' sense of freedom to make decisions that control certain aspects of their work, including scheduling, curriculum, textbooks, and instructional planning. Acting proactively is considered in this work as one of its manifestations.

- Impact – relates to the teachers' sense that their work has an effect on school life; the feeling that what they are doing is meaningful, that it is enacted in a competent manner, and that their accomplishments are valued. This dimension merges with the sense of satisfaction in this study in expressions of happiness, enthusiasm and exhilaration which accompanied the teachers' learning and their sense of capability when they succeeded in fostering their pupils' growth.

The above attributes suggest an interaction between personal and situational factors; metacognitive competencies (Cubukcu, 2008) and environmental factors. Valot (2002) suggests that work environments provide opportunities to observe metacognition as applied to job challenges. Workplaces (such as schools) often present situations where one faces the need to make risky decisions, often with incomplete knowledge and at times, uncertainty about one's own performance. Thus, providing teachers with a nurturing learning environment within their workplace is intended, in this study, to foster their empowerment as well as to observe and assess the impact of the MM on such growth. The next section will present the concept of 'The Learning Organisation' (Senge, 1990) as chosen in this study to characterise a school environment that enhances self-regulation in teachers as mediators of thinking skills. Characteristics of an ideal organisational environment will be derived from it.

2.4 The Learning Organisation – Framework for Teacher Empowerment

An adult's essence is found in the essence of the environmental conditions. (Vygotsky and Luria, 1930/1993, cited by Ratner, 1998)

2.4.1 The need for coherency in the school's micro and macro levels of learning

The main premise that provided the underpinning for this thesis was that teacher development can be nurtured through the learning environment. Senge's (1990)

concept of 'The Learning Organisation' (through his seminal work *The Fifth Discipline*, 1990) was inspiring for this work and was found to be compatible with notions of empowerment in the socio-cultural conceptual framework of this thesis. This concept has gathered momentum in education in general (Turkington, 2004) for over a decade, including within the Israeli educational system. Integrating the concept of the learning organisation through school activity constituted a communication channel for connecting with the educational community's discourse. It has also contributed to defining criteria for examining supportive characteristics of the teachers' learning environment.

Both organisational and socio-cultural theories of learning were found conceptually congruent. They relate to learning processes as socially shared activity, where meaning is constructed through the dynamic interactions between individuals and their environment. Both involve systems thinking with a constructivist approach to learning and development. Similar understanding can be found in Ogawa et al. (2006), where these overlapping notions are discussed.

For Vygotzky (1978, 1962), the social and cultural context is a reflection of the thinking dimension of an individual's mental activity. Other writers like Wang and Ahmed (2003, in Turkington, 2004), taking an organisational point of view, are also concerned with the social and cultural aspects of learning. However, they accent individual learning processes as the starting point for understanding organisational learning. In their view, the individual is the mirror who reflects learning and development processes of the organisation. The overarching socio-cultural framework of this thesis encompassed both of these two points of departure – learning by the individual and by the organisation, which are perceived as two interacting factors through which human development takes place. The following sub-section presents considerations in selecting characteristics of a learning organisation that are compatible with the overarching conceptual framework of this thesis.

2.4.2   Characteristics of a learning organisation

Argyris and Schön (1978, 1996, in Turkington, 2004) laid the theoretical foundations for the concept 'the learning organisation'. They view it as a powerful idea for increasing an organisation's capacity for effective action. However, it was Peter Senge's (1990) work that popularized the concept of the 'learning organisation' and raised learning organisation theory to new heights (Cullen, 1999 in Turkington, 2004). His work was a source of inspiration for this thesis, as it fostered my understanding of the dynamics involved when reforms impose conflicting demands on teachers and schools.

Senge (1990) claims that learning organisations are those that succeed in creating commitment and capacity, emphasizing continuous learning through gradual development and the mastery of five disciplines: **systems thinking, personal mastery**, **mental models, building a shared vision and team learning**. A 'discipline' is viewed as a series of principles and practices that we study, master and integrate into our lives.

Each of the five disciplines constitutes a vital component of the others if organisations are to 'learn' (*ibid*, p. 6). These characteristics of the learning organisation were compatible with my own philosophical and theoretical perspectives for learning. They also refer to the study of channels of communication, effective resource acquisition and policy leverage, which are relevant to organisational empowerment (Zimmerman, 2000).

Turkington's (2004) comprehensive review of the learning organisation cites several writers who criticize Senge's (1990) idealistic, philosophical orientation as failing to provide a practical guide for implementation. This criticism focuses on the lack of objective terminology, a drawback that makes the practical application of the learning organisation problematic (Zairi, 1999 in Turkington, 2004). For this study, it was just this lack of a defined operative framework that provided me with the

flexibility to design conditions for teacher learning within the complex school environment.

Further criticism comes from Cullen (1999, in Turkington, 2004), pointing at the need to enrich the concept of the learning organisation by a stronger reference to contemporary developments in learning research. Integrating the concept of the learning organisation with the socio-cultural conceptual framework responded to this need. Using this concept, which was promoted by the Israeli Ministry of Education as a way to empower teachers as learners, contributed to the need to promote coherent discourse in school, and focused school activity on teaching and learning processes.

Senge's powerful, intuitive and practical conception of the learning organisation suited features of my own intuitive thinking, which recent studies reveal as the most productive tool for practitioner development (e.g. Claxton and Atkinson, 2000). Wonacott (2000, in Turkington, 2004), views Senge's notions as inspiring for understanding organisations. The rich metaphors he frequently used fostered my understanding of teacher development in the context of school dynamics. Moreover, his reference to the emotional, cognitive, social, and cultural aspects of learning in the organisation provided current perspectives compatible with the overarching theory of this thesis. Integration of his work into this thesis yielded a win-win framework, where policy-makers' intentions were exploited in a way that furthered the teachers' needs for empowerment.

The aforementioned five disciplines as suggested by Senge (1990) will be presented below in the manner by which they guided me in mentoring learning processes in the school organisation. Each one will be presented as it was integrated into the conceptual framework of this thesis.

2.4.2.1 Systems thinking

Senge's (1990) reference to systems thinking draws on theoretical approaches which have been developed over the last fifty years (*ibid*). Accordingly, I will integrate several additional perspectives that merged within his orientation and highlight them. This concept serves as the cornerstone of the learning organisation, which integrates the other four disciplines. Systems thinking as a conceptual strategy aims at organising a complex reality into a coherent whole. It creates a framework that focuses on seeing relationships between the defined parts of a complex whole: "for seeing patterns of change rather than static 'snapshots'" (*ibid*, p. 68). Weinberg (2001, see Sub-section 1.1.4) also emphasises the essence of a system as being embedded in a new relationship between a system and an observer. Accordingly, 'the image of the whole emerges' (Senge, p. 68), whereby as observers we begin to see new "structures" and identify relationships we failed to relate to before. Likewise, in this thesis, dialectic interactions between micro and macro levels of interactions (Minnis and John-Steiner,2001), the individual's levels of learning (micro) and those of the organisation (macro), between power relations and empowerment, or reactivity versus proactivity, broadened my systems approach to teacher progress.

Such a unity of purpose provided a coherent framework through which to structure the teachers' learning environment. It is congruent with characteristics of newly developed social systems approaches as suggested in the work of Maturana and Varela, (*Autopoiesis and Cognition* 1980, cited by Vanderstraeten, 2004). 'Autopoiesis' represents a *constructivist* view that refers to self-production, where living systems (organisms, social systems) cause certain products to be produced. Thus,

> The interconnection of system and environment is dependent on the closing-off of the system's self-production from the environment. Knowledge of the external world (cognition) can only be acquired on the basis of internally circular structures (autopoiesis)… (Vanderstraeten, 2004, p. 258)

This systems approach leads from an interest in planning and control to an interest in autonomy and environmental sensitivity, and from structural stability to dynamic stability (King and Thornhill, 2003 in *ibid*). It also makes it necessary to analyse (and not just to formalize) the mechanisms that are used to establish and maintain boundaries between the system and the environment (*ibid)*. Similarly, the MM adopted strategies of 'control without control' (Senge, 1990), where teachers were afforded mediation which were attuned to their defined goals and level of progress.

In this line of thought, learning does not mean acquiring information but rather a widening of our abilities and perspectives – our 'learning horizon' (Senge, 1990, p. 23). Vanderstraeten (2004), who draws on Luhmann's work, explains that social systems (such as schools) 'use communication as their mode of reproduction…; meaning can be actualized only by circulation in the network of ongoing communication' (*ibid, p.* 259). Accordingly, we can react to our environment only according to our own patterns of operation or conceptualization (Vygotsky, 1962). These notions echo Bateson's (1972, p. 453) idea of 'the difference which makes a difference', which can be used to explain the essential function of mediation within the learner's ZPD (see Sub-section 2.2.1). It clarifies why 'When our actions have consequences beyond our learning horizon, it becomes impossible to learn from direct experience' (Senge, 1990, p. 23).

Thus, when faced with a problem, it is the 'solutions' that are close by that we focus on – actions that produce short-range improvements but long-term costs (*ibid*). In contrast, when applying system thinking we see patterns rather than separate details, which delays our tendency to think that cause and effect will be relatively near to one another, since 'the systems viewpoint is generally oriented toward the long-term view' (*ibid*, p. 92). Similarly, change is detected in patterns of growth at the level of the school and the teacher based on identifying change in teacher-pupil and teacher-mentor participant structures (Wertsch, 1985, cited by Zellermayer, 2004) (see Chapter 3).

2.4.2.2 Personal mastery

> Organisations learn only through individuals who learn. Individual learning does not guarantee organisational learning. But without it no organisational learning occurs' (Senge 1990, p. 139).

Personal mastery is the discipline of 'continually clarifying and deepening our personal vision, of focusing our energies, of developing patience, and of seeing reality objectively' (*ibid*, p. 7). People with a high level of personal mastery never 'arrive' (*ibid*, p. 141), they live in a continual learning mode. It is a lifelong discipline; here, a high level of personal mastery is manifested in teachers being

> …aware of their ignorance, their incompetence, their growth areas. And they are deeply self-confident. Paradoxical? Only for those who do not see that the 'journey is the reward'. (*ibid*, p. 142)

This last statement is one of many where Senge 'called' my attention to the need to adopt his five disciplines as productive guidelines for nurturing a learning environment for teachers. The way he approaches and articulates learning coincided with my perception and understanding of this multidimensional process – it is embedded in human nature and when afforded with the proper environmental conditions (cognitive, emotional, social and cultural mediation) it can be a source for exhilaration. Brain research and its implementation for learning (e.g. Goleman, 1995; Jensen, 1998), though not central to this work, was another supporting source for conceptualising learning in this thesis. Through it, the metaphor given by Senge (1990, p. 142), which emphasized that in meaningful learning, the 'journey is the reward' receives scientific validation (Sub-section 2.2.1.1 (E)) rather than disqualifying it due to its lack of objective terminology.

Managing paradoxes relates, for example, to holding creative tension, while managing the gap between vision and reality, or recognizing our own power or lack thereof (*ibid*). Similarly, Engeström (1999), who views learning as an expansive process, uses the idea of contradiction. According to this view, a learning system, like the learning organisation, is always confronted by contradictions (paradoxes) that create disturbances and discoordination, which are vital for the system's

growth; they create movement and turning points which energize the entire system (*ibid*).

Fostering openness is Senge's view (1990) of how to cope with conflicts such as 'internal politics and game playing' (*ibid*, p. 274*)* which dominate traditional organisations. He distinguishes 'participative openness' from 'reflective openness' (*ibid*, p. 277). The later means having the "freedom to speak one's mind…to be open in a way that leads people through the discourse to 'looking inward" (*ibid*, p. 277). 'Participative openness', on the other hand, characterises most organisational conversations, where people get to express their views but are rarely involved in changing each other's point of view.

Moreover, personal mastery associates growth as leading from reactivity and dependence towards proactivity and taking responsibility for our own actions, which is similarly addressed by Covey (1989) as a central feature of professional growth. Proactivity coincided with my philosophical approach for coping with the constraints in the learning environment of teachers. It requires imagination, since big plans 'begin with the end in mind' (*ibid*, p. 97). This ability seems to correlate with systems thinking as it also requires seeing the general pattern. This compatibility of Senge's five disciplines with my philosophical approach was another reason for the adoption of his work through this thesis.

2.4.2.3 Mental models

This discipline connects to the main objective of this thesis, which aimed at fostering change in teacher pedagogy through the development of their metacognitive knowledge and skills. These are 'deeply ingrained assumptions, generalizations, or even pictures and images that influence how we understand the world and how we take action' (Senge 1990, p. 8). Thus, in line with Schön's notions, developing our ability to <u>reflect in- and on-action</u> through the reflective mentoring discourse was aimed at fostering such change. Mediating these

developmental processes was assumed in this thesis to empower teachers as learners who gain control in coping with new pedagogical tasks.

2.4.2.4 Building shared vision.

Both Peter Senge (*ibid*) and Vygotzky (1962) view human development as being socially-oriented. Thus, what inspired organisations for thousands of years, is 'their capacity to hold a shared picture of the future we seek to create' (Senge 1990, p. 9). Such a vision has the power to be uplifting – and to encourage experimentation and innovation. This can also foster a sense of the long-term, something that is fundamental to systems thinking. Personal engagement through shared vision is the essence of a real social group, as opposed to compulsion of external ends that Dewey (1916) warns us to avoid. Moreover, Dewey stresses that top-down imposed ends from superior authorities projects a distrust of teacher experience, neglecting the teacher's emotional and intellectual resources. This leads to confusion, lack of confidence (*ibid*), and motivation to learn, a phenomena validated by recent brain research (Jensen, 1998; Howard, 2000). In this thesis, the MM attempted to reinforce processes that were aimed at increasing clarity in school discourse, enthusiasm and the teachers' commitment to meet shared goals – 'As people talk, the vision grows clearer. As it gets clearer, enthusiasm for its benefits grow' (Senge, 1990, p. 227).

2.4.2.5 Team learning

Since learning is a socially embedded process (Vygotsky, 1962, 1978), team learning is a vital factor in the organisation. It requires communication tools (Vygotsky, 1962), which Senge (1990) expands to include shared structures that assist people in dealing with complexity. Such learning is viewed as 'the process of aligning and developing the capacities of a team to create the results its members truly desire' (Senge 1990, p. 236). As team learning builds on personal mastery and shared vision, a shared language is needed so people can act together. Similarly, reflective dialogues enacted through the M.M aimed at affording teachers with frameworks through which to establish a coherent meaningful discourse. When

dialogue is paired with systems thinking, Senge argues, language use focuses on deep-seated structural issues and forces, rather than being diverted by questions of personality and leadership style.

As stressed by Smyth (1991) and supported by my personal experience, the school's formal organisation often inhibits colleagueship among teachers. Isolation and a lack of continuous and careful support drastically impede their professional growth (*ibid*). Thus, mentoring teachers towards their empowerment through their engagement in a collective school activity was aimed at filling the gap between the teachers' growth potential and their current disempowered position in school.

2.5 Mentoring in the Learning Organisation – Mediating Teacher Empowerment

Mentoring was found to be an appropriate term to frame my role in the context of this study. The term 'mentor' is generally chosen to describe a caring relationship between a more experienced individual and a novice, known as mentee or protégé (Clutterbuck, 2004; Mullen and Lick, 1999; Barrett-Hayes, 1999; Gilbreath, Rose and Dietrich, 2008). This term is borrowed from Greek mythology – Odysseus, the King of Ithaca, asked Mentor, his faithful companion, to raise his son Telemachus in due course as his successor. Mentor's characteristics of being 'purposeful about teaching, loving and supportive, guiding and nurturing as well as creative and insightful' (Barrett-Hayes, 1999, p. 137) were found compatible with my view of mentoring and the theoretical perspectives of this thesis with respect to learning, where teaching and learning interactions are viewed as a productive path for metacognitive developmental processes within each teacher's ZPD.

Mentoring is perceived as a multifunctional role (Clutterbuck and Megginson, 1999, Megginson, 2000, Tang and Choi, 2005; Gilbreath, Rose and Dietrich, 2008). Megginson (2000) claims that in fields of practice such as mentoring, definitions are generally drawn by observing what people do; thus, it is associated with different actions such as: 'befriending, advising, encouraging, promoting' (Mullen,

Kochan and Funk, 1999, p. 31), as well as collaborating, coaching, assisting, instructing and co-learning (Little, 1990, in *ibid*). However, Clutterbuck's (2004) claim is that none of these concepts is inclusive enough to apply to mentoring since, in practice, mentors provide a particularly wide range of support. He distinguishes mentoring from other supporting roles such as coaching or counselling by highlighting its holistic nature. Accordingly, coaching is task-oriented, short-term, and emphasises explicit feedback to the learner with respect to performance and skills. Mentoring, on the other hand, is concerned with long-term relations and implications beyond the task; it focuses on the learner's potential, and emphasises feedback by the learner in relation to intuitive/implicit knowledge (*ibid)*.

2.5.1   Mentoring models – meaning and practices

The meaning and practices of mentoring vary by discipline and curriculum (e.g. business, psychology, medicine, academics and education). Clutterbuck (2004, p. 11) claims that the concept of mentoring has been considerably influenced by culture − organisational and national − which shapes approaches to mentoring styles. He points for example to the significant differences in the meaning of this term as employed in the North American and European models (e.g. the UK). In North America, where the general model is a sponsoring type of mentoring, the accent is on the formal, hierarchal relationship between mentor and protégé − 'one who is protected' (*ibid*, p. 20) and who models him or herself on the mentor. Accordingly, guidance is received in a traditional style of interaction, where the mentor is considered wise and experienced. In the European school, on the other hand, the accent is on developmental models; placing more emphasis on the reflexive aspect of the relationship, where mentors may learn from their experience with the mentees. In addition, mentees are encouraged to think for themselves and even act independently, as empowerment and developed competencies are embedded in developmental models. While in the US, the focus of mentoring is on career development and psychological support, in the UK, the focus of mentoring is on learning and development.

In education, the traditional approach is based on expert knowledge and higher authority (Mullen, Kochan and Funk, 1999), manifested in a hierarchical relationship between mentor and mentee. In fact the term *protégé* literally means 'one who is protected' and mentee means 'one who is helped to think' (Clutterbuck, 2004, p. 20). While the latter projects equal, reciprocal relationships, the former term suggests dependence. Current needs, though, have expanded this definition, as new educational reforms have demanded improvements in pupil academic achievements, teacher empowerment and institutional change (*ibid*). Similarly, Orland-Barak (2004, p. 199) highlights the changing orientation of mentoring in Israel, which echoes current reforms. It is:

> …gradually shifting from a teacher development orientation towards a pupil achievement orientation, creating a discourse of practice geared to interventions that focus mostly on raising pupils' achievements in specific areas'.

Guskey (2000) claims that educational improvement involves complex processes which require a systemic approach to teacher professional development. Accordingly, he recommends the integration of several developmental models. Mentoring is one of the major models of professional development that he describes (based on reference to Sparks and Loucks-Horsley, 1989, in *ibid*). The other models involve constructivist approaches to learning and evaluation processes such as training, observation/assessment, involvement in a development process, study groups, inquiry/action research and individually guided activities (*ibid*, p. 22). The next sub-section will present common approaches used in mentoring models in Israel.

2.5.1.1   Mentoring models in Israel

In Israel, various frameworks for teachers' professional development programmes are promoted and employed by the Ministry of Education ("the Ministry") through external bodies and educational projects (see Sub-section 1.1.1). The present study used the school training programme as the framework for its holistic approach, aimed at engaging school staff in a collaborative learning experience.

While these programmes echo constructivist orientations toward learning of current reforms, Karagiorgi and Symeou (2005, p. 22) accent the limitations involved in translating constructivism (which relates to knowledge and learning as individually constructed), into instructional design; for constructivism, 'evaluation emerges naturally from authentic tasks and measures learning gain but not mastery of a pre-determined set of skills'. On the other hand, current educational policies advocate setting standards to assess the meaningfulness of teacher learning. Thus, school mentors are challenged with these seemingly conflicting needs.

In addition, a shift in Ministry policy towards the development of autonomous schools creates additional challenges. On the basis of a yearly budget, each school can independently decide on curriculum innovations and pedagogical interventions (Orland-Barak, 2004). The need by mentors to market their services (*ibid*) generates new kinds of conflicting dilemmas – ethical conflicts and conflicts around issues of role boundaries (Rubinstein, 1999), as explicit definition of the mentor's role are lacking (see Section 1.1.1).

Additional constraints with which mentors must cope are highlighted by Arieli and Shachor (2003). Outside experts are perceived as those who try to introduce new ideas, often foreign to the school's needs. Reforms are perceived as 'a passing fad'. Moreover, the entry of experts is perceived as an action of covert supervision by the education authorities, risking the exposure of weaknesses of the school and its staff. However, following Engeström's perspective on contradictions, these constraints provide opportunities for creativity in attending to the multifaceted needs of the school. Accordingly, the MM in this thesis, compatible with Tang and Choi's strategy (2008, p. 385, in reference to Wang and Odell, 2002), used the dialectic between theory and practice to create:

> …mentoring skills and knowledge of mentoring [that] are actively constructed by mentors and modified through integration of their practical knowledge of teaching and learning.

I found this constant need to modify and redefine mentoring (relationships, models) in current studies and trends in mentoring (e.g. Mullen, Kochan and Funk, 1999; Megginson, 2000; Clutterbuck, 2004 ; Orland-Barak, 2004; Evans, 2007) to be a productive trigger for developmental processes when it is interwoven with socio-cultural perspectives to learning. This integration seemed natural in this thesis, as current reforms and new trends in mentoring similarly address social, emotional, cognitive and cultural aspects in the teachers' learning environment:

a.   **The social** aspect of learning, is expressed in the call to move from one-on-one, hierarchical, individualistic modes of mentoring to collective ones (Hargreaves and Fullan, 2000).   These encourage dialogical forms of interactions which echo the reflective practice approach to teacher education (Dewey, 1933; Schön, 1987; Senge, 1990).

b.   The **emotional** aspect of learning is emphasised through a growing awareness of emotional intelligence (Jensen, 1998; Howard, 2000; Megginson, 2000, Evans, 2007).

c.   The **cultural aspect** (Lick, 1999, p. 203) of the school is emphasised, reflecting characteristics of a learning organisation. Mentoring requires that 'the "whole faculty" be active in study groups with each group taking responsibility for an important part of the change or reform efforts'.

d.   Emphasis on the **cognitive aspect** of learning – enacting a critical reflective practice aimed at the development of new insights and comprehension skills (Evans, 2007).

Socio-cultural perspectives provided me with several operative paths through which to cope with the challenging task of mentoring the teachers' metacognitive developmental processes. The next chapter will present the research methodology which incorporated these perspectives in an attempt to foster such growth.

Chapter 3   Methodology and Design

3.1 An Overview

This research was undertaken in the context of a professional development programme for teachers. It focused on fostering teachers' empowerment and on exploring the impact of the mentoring model (MM) in meeting this goal. The teachers' metacognitive development in the domain of mediating thinking/learning skills and their sense of efficacy and job satisfaction are recognized as central elements in assessing their empowerment. The MM employed a holistic approach which 'insists that knowledge of things requires understanding elements as complex, multifaceted entities that are dialectically related' (Ratner, 2008).

A research methodology was thus needed that would enable exploration of teacher development as part of a complex whole, one that mirrored social and cultural interactions in the context of collective school activity (Engeström,1987,1999). The MM was designed to meet the emerging need to initiate procedures that can empower teachers to fulfil their role as key players in the development of a learning society (Fullan, 1993; Bruner, 1996; and Claxton, 2008).   Methodological considerations thus focused on exploring effective ways of engaging the school's teachers in developmental change processes.   These yielded a 'multi-method' inquiry process (Denzin and Lincoln, 1994). In this overview, I will refer to the different philosophical, theoretical and ethical aspects that accompanied these considerations.

3.1.1: Taking a qualitative approach to data collection and analysis

Teacher empowerment as the main objective of the research drew on various features of the qualitative approach. This approach is often referred to as qualitative-constructivist (Shkedi 2003), interpretive-naturalistic (Denzin and Lincoln, 1994), constructionist-inductive (Bryman, 2001), or holistic (Ratner, 2008). It is consistent with the socio-cultural constructivist perspective toward

learning and development adopted by this thesis (as explained in Chapter 2). Each of the features that characterise the qualitative approach will be discussed in this overview.

The inductive approach was reflected through the research strategy of weaving back and forth between data and theory (Bryman, 2001, p. 10). My aim was to gain meaning and understanding through the inquiry process (Denzin and Lincoln, 2000) rather than focussing on assessing and presenting the results of the teachers' metacognitive development. Accordingly, I sought to detect 'the pattern of steps of the developmental dynamic' (Ratner, 2008) that fostered teacher growth. These constructivist features were found to be a relevant framework in which the research methodology could nest.

Research undertaken with a quantitative, positivistic approach assumes that there is a reality out there which the researcher can capture as an outside observer (Bryman, 2001). It relates to data as objective information, where biases caused by the observer's subjectivity should be avoided. Charmaz (2000, in Shkedi, 2003), for example, claims that the traditional methodology of this theory is based on principles of positivistic assumption where the researchers assume the existence of an external reality waiting to be exposed and traced by them. Constructivist-qualitative perspectives on the other hand perceive the world as a multitude of realities which are the outcome of human construction (Bruner, 1996; von Glaserfeld, 1995, Shkedi, 2003). Accordingly, in this thesis, the knowledge developed by teachers is viewed as the construct of individuals derived through situated social interactions (Lave and Wenger, 1991) and mediated by the cultural, linguistic environment (Vygotzky, 1978; Sjøberg, 2007).

When comparing constructivist-qualitative and positivist-quantitative studies, Shkedi (2003) points to similar stages through which knowledge is produced. Both positivistic and constructivist approaches relate to the nature and form of reality (ontological aspect), to the relationship between the knower and what can be known (epistemological aspects) and to the way we practice and inquire about what we

believe can be known (methodological aspect). Both are involved with presenting a problem, raising questions, collecting information relevant to the questions, analyzing data and producing answers to the questions. However, these two approaches differ in their process of inquiry. Differences in methods of social research are linked to the researcher's approach of 'how social reality should be studied' (Bryman, 2001, p. 4).

The constructivist-qualitative approach suits the goal of this thesis of affecting change in teacher pedagogy. As with the constructivist approach, the constructivist-qualitative approach sees learning as a cyclic, expansive and unpredictable process, with the research methodology evolving dynamically throughout this study. Accordingly, initial questions were transformed as new ones arose through the ongoing processes of constructing meaning. Such an investigative approach thus demanded the flexibility that the constructivist approach allows. Accordingly, the methodologies were adjusted through continuous interpretations of the data in its new context. Rather than merely collecting objective data, my role was directed toward assessing data and modifying/generating tools that made it possible for me to track the teachers' knowledge and to mediate their further progress. I will relate more concretely to this issue next.

The qualitative-constructivist approach undertaken in this study adopts a holistic view to human learning (Stake, 1995, in Shkedi, 2003). This was manifested in the systems approach of the MM that afforded 'seeing circles of influences rather than straight lines' (Senge, 1990, p. 75). Similarly, tools (such as a skill rubric), which aimed at fostering the pupils' thinking skills, caused a change in teacher awareness. In turn, through reflective discourse, the newly constructed rubric was demonstrated as a useful tool for assessing teacher progress. Thus, data collection, production and analysis constituted elements in a system of relations (Ratner, 2008) creating multiple methodologies that contributed to meeting the research goals.

The next sections will present the broad array of methods created for coping with the challenging task of teacher empowerment in its authentic, complex and dynamic context.

3.1.2: Multiple methodologies – constructing and analyzing teacher empowerment in a dynamic environment

The methodology employed in this study had two purposes: the first was directed toward evoking change in the teachers' metacognitive growth as mediators of learning/thinking skills, and the second toward exploring the dynamics of such developmental processes. This methodology was embedded in a holistic, systemic research approach (Vygotsky, 1978, Ratner, 2008). Accordingly, methods and tools for mediating the teachers' metacognitive development constituted parts of complex wholes (Vygotsky, 1962) as '...the method is simultaneously prerequisite and product, the tool and the result of the study...' (Vygotsky, 1978, p. 65)

Action research methodology was similarly applied due to its dual nature, both as an instructional method and as a research strategy (Elliott, 1989), to which the next sub-section relates.

3.1.2.1 Adopting action research as an empowering strategy

Action research as a methodology merged with the philosophical and theoretical perspectives of the research that relate to collective enterprises. Its procedures (Fig 3.1) document how the educational problem is identified, interpreted and solved by practitioners are described in terms of cycles (Cohen, Manion and Morrison, 2000, p. 229), each of which includes four phases: 'planning, acting (implementing plans), observing (systematically)[and] reflecting' (Kemmis and McTaggart, 1992 in *ibid*). These procedures afforded an overarching framework through which research collaborators could engage in reflective practice. Such learning was compatible

with the research goal of promoting the developmental process (Vygotsky, 1978; Kolb, 1984; Engeström, 1987), which was assumed to empower teachers.

In addition, action research as an overarching methodological framework suited for framing the plan and activities of the mentoring programme, as well as the reflective mentoring discourse. It is also compatible with central principles in Vygotsky's methodology (1962, 1978), where developmental research is viewed as process-oriented and systematic, allowing collaboration through learning interactions.

This methodology makes it possible for both the teachers and I to be flexible and responsive, and to enact systematic, rigorous strategies that afforded authenticity and voice (Cohen, Manion and Morrison, 2000). Since action research does not require a defined structured methodology as is the case in quantitative research, it enables both teachers and mentor to engage in reassessing their progress. This explains the transformation of the research questions, the action plan, the methodology and their perspectives, all while coping with developing school curriculum with a thinking skills core. This approach thus fits the dynamic environment of the teachers' work place, which can also explain its growing popularity in the field of education (*ibid*).

While there is no one right way to conduct action research, it is broadly defined as a collaborative activity where the action researcher and the client cooperate in identifying a problem and in developing an appropriate solution to it (Bryman, 2001). This approach aims at generating change and empowering people (individuals as well as social groups) as they obtain control over their lives (Habermas, 1976, in *ibid*). It is also based on the premise of shared ownership, where teachers actively participate in exploring the pedagogical problems in their school (Kemmis and McTaggart, 1988 in Denzin and Lincoln, 2000).

Moreover, action research, with its focus on collaboration with teachers, was compatible with my belief in them as active learners who can take charge in improving their own practices. It afforded them the opportunity that they usually lack in school, which is to engage in systematic inquiry. Teachers are thus motivated to improve their teaching practice and the quality of their understanding (Winter and Munn-Giddings, 2001), 'from the effects of the changes made' (Kemmis and McTaggart, 1992, in Cohen, Manion and Morrison, 2000, P. 227).

Action research was also found to be compatible with my approach to the teachers' professional empowerment, both as individuals and groups, as they were equally encouraged to transform the culture of the organisation (*ibid*). The school culture, defined in this study in terms of the characteristics of a learning organisation (Senge, 1990), was assessed through the 'language and discourses, activities and practices, and social relationships and organisation which constitute the interactions of the group' (Kemmis and McTaggart, 1992, in Cohen, Manion and Morrison, 2000, p. 227). These will be presented later on in the section on research tools.

As a methodology, action research brings together two professional groups, teachers and researchers, each with its own objectives, in order to share the same interest in an educational problem (Cohen, Manion and Morrison, 2000). Enabling teachers to exercise their role as reflective practitioners (Schön, 1983, 1988), to join and take an active part in producing knowledge, is viewed by Elliott (1991) as a manifestation of action research. It is also compatible with my perspectives of power-sharing. Since power conflicts exist in the school, which functions as a bureaucratic organisation, the implementation of this methodology allowed me to collaborate with the teachers as a mentor-researcher who could join them in a reciprocal process of learning and from a position of equality.

Any debate between viewing action research as an individualistic matter or strictly as a group activity involves some relevant consideration in reference to this study. According to McTaggart (1992, in Cohen, Manion and Morrison, 2000), favouring the group form is based on Lewin's legacy of commitment to group decision-

making This attitude assumes that the individualistic approach might destroy the critical dynamic involved in group interactions (*ibid*). On the other hand, within the movement of 'teacher-as-researcher' it is possible to relate to action research as an individualistic act (Stenhouse, in Cohen, Manion and Morrison, 2000; Whitehead, 1989). The present research combined these two lines of approach. In doing so, the MM afforded a reflective environment to all 'constituent parties whose activities shape and impinge upon processes of teaching and learning' (Elliott, 1991, p. 42). The individual path was compatible with my concerns and aspirations in this study and manifested in questions such as: 'How can I evaluate the teachers' metacognitive development?' or 'How can I engage teachers in a learning process that yields satisfaction and the exhilaration of learning?'

3.1.2.2   The researcher's role

My conceptualisation of learning events had an impact on the selection of the issues to which I responded and to those that I found marginal. Given that the researcher has a central role in interpreting data, this highlights the power of subjectivity in the qualitative approach, as 'the social world can only be understood from the standpoint of the individuals who are part of the ongoing action being investigated' (Cohen, Manion and Morrison, 2000). Similarly, this dynamic of data interpretation, through the dialogue with the teachers, served as an ongoing vehicle that assisted me in making sense of the teachers' current progress or difficulties as well as in planning the needed scaffolding within each teacher's zone of proximal development.

Conducting action research as a process of self-study (Whitehead, 1989) helped develop my awareness and reflexivity, which is essential when the researcher is a practitioner (as a mentor) and a research participant (Whitehead, 1989, 2000; Cohen, Manion and Morrison, 2000). Self-study was undertaken in parallel to the school's collective axis of action research in this study, affording teachers a path to mobilise their identified concerns:

> 'How can we foster pupils' thinking skills?'
> 'How can we collaborate in constructing school curriculum with a thinking skills' core?'

In this study, this kind of collaborative involvement took on the characteristics of emancipatory action research (Zuber-Skerritt, 1996, in Cohen, Manion and Morrison, 2000) as teachers were enabled, through the negotiation of meaning and through self-critical inquiry, to initiate the transformation of the research design and to reform their teaching methods (*ibid*).   Thus, action research methodology together with my self-study constituted two axes which interacted reciprocally, merging through the school discourse, transforming one another and yielding new understandings in both teachers and mentor.   Revans (1982, in Hacohen and Zimran, 1999), in reference to this reciprocal inquiry process, asserts that people learn from each other only when they find out that neither of them knows the answer.

The cyclic platform of action research was used in a way that allowed small experiential cycles (Kolb, 1984) relating to individual teacher and group learning processes through the research's three major cycles (Figure 3.1).   This approach receives support from Ebbutt (1985, in Cohen, Manion and Morrison, 2000, p. 235) who views 'feedback within and between each cycle' as essential for facilitating reflection.   It is also reinforced by the action research model of Altricher and Gstettner (1993, in Cohen, Manion and Morrison, 2000) as it avoids the technical divide between data collection, analysis and interpretation.

First Cycle (Pilot study)
A sense of a problem – the need to empower teachers. Action centred on the development of a teaching strategy for enhancing pupils' thinking skills.

Second Cycle
Redefinition of the problem: focusing on teacher empowerment through their metacognitive development as mediators of thinking skills. The revised plan added methodological rigor.

Third Cycle
Action plan directed and carried by coordinators. Acceleration in teacher involvement in carrying on the school programme and cross disciplinary learning interactions.

Figure 3.1:   The Research's Three Cycles

As a form of action research with a qualitative approach, this study had to cope with uncertainties characterising a field experiment. Control over arrangements of the experiment was limited, as opposed to laboratory experiments common in social psychology (Bryman, 2001). Thus flexibility of an action research methodology was essential for coping with dilemmas that arose at various turning points in this study. Action research served in this study both as a methodology and as a strategy for instruction (Elliott, 1995) and constituted a coherent part of the mentoring programme. It assisted me in designing the different learning cycles at both the school organisation and teachers' level.

Elliott (1991) supports this strategy and advocates the use of action research as a vehicle that deals with the multifaceted aspects of the learning process such as teaching and teacher development, curriculum development and evaluation. It assessed the impact of the mentoring model on the development of the teachers, the mentor and the organisation while simultaneously offering a structured learning activity that facilitated the teachers' learning processes.

Data interpretation was undertaken as an ongoing assessment process, which served the reconstruction of the planned cycles of the research and as an attempt to enhance productive learning and teaching experiences. This double role assumed to project a systems approach where elements that interact with the system components function interchangeably as cause and effect.(Vygotsky, 1962; Senge, 1990). Thus, the product of the teachers' metacognitive development was used as vehicle for affecting change and assessment focused on the 'matrix of cultural and psychic forces' through which the subject is constituted (Winter 1987, p 48). Applying discourse methodology afforded such multilevel analysis to take place.

3.1.2.3 Discourse - a multifunctional methodology for mediating developmental processes

While action research provided an overarching framework for conducting the mentoring programme, discourse methodology was needed for mediating developmental processes throughout the different learning cycles.

Coyle (1995, in Cohen, Manion and Morrison, 2000) relates to discourse as a set of linguistic materials which enable people to construct meaning in social contexts due to its coherence in structure and content. In this regard, the different levels of interactions embedded in the present MM's inquiry process (Figure 3.3) created a rich and multilevel discourse text (drawn from interviews, observations of team interactions, conversations with teachers, the teachers' written reflections, documents related to teaching constructs, my personal research journal and notes taken through out this study).

The three major functions ascribed to discourse in this study are**:**

A. <u>A communicational tool</u> – aims at transporting meaning through language which uses various forms of communication: talk and forms of written text (Bryman, 2001) as the teachers' written reflection, teaching material.

B. <u>A developmental tool</u> – Discourse mediate the construction of concepts through meaning negotiations, thus it is *'constructionist' (ibid*, p. 360), rather than an objective tool for imparting meaning. By directing talks and communal action to meet the school common goal, discourse manifested its generating role in fostering teacher self-regulation (Pintrich, 2000).

C. <u>An analysis tool</u> – analysing the teachers' metacognitive development through multiple discursive instruments (to which I will return in Section 3.4).

These functions explain the methodological value of discourse for enhancing teacher developmental processes. In addition to discourse's role in mediating cognitive activity and dialogue, it is viewed as complementing the use of other tools (Blanton, Moorman and Trathen, 1998). For example, offering accurate ways of checking the match or mismatch between curriculum, teaching and learning (Lemke, 1998).

Vygotsky (1978) strongly asserts that a mere description of events does not reveal the actual causal dynamic relations that underlie mental functioning. Measurement of developmental processes, such as the teachers' metacognitive development, thus required a methodology that relates to such a dynamic. Discourse thus was a central tool in the research methodology; it enriched the study of teacher development as a complex process, which is socially and culturally constructed. In addition, it mediated the collective activity at the school (Wertsch, 1991; 1994; Blanton, Moorman, and Trathen, 1998) through the MM and fostered teacher empowerment. Moreover, while discourse analysis has often been criticised for its emphasis on linguistic construction of social reality (Lemke, 1998), the present work related equally to the text and the historical context of teachers' behaviour, as verbal data makes sense only in relation to a specific activity (Lemke, 1998). The same word may have different meanings to different teachers or for the same teacher in different contexts or stages of his/her conceptual development. As Vygotsky (1962, p. 148) put it: 'Every sentence that we say in real life has some kind of subtext, a thought hidden behind'. Likewise, the research methodology employed a strategy where language derived from conversations and documents was analysed in the context of the research programme. Thus, such data did not 'represent a homogeneous population of isolates which can be sampled in the statistical sense' (Lemke, 1998).

In light of the above, content analysis as an approach seeking to systematically quantify content embedded in words from documents and dialogical texts (Bryman, 2001), detached from its particular context, was thus not deemed appropriate for a study of metacognitive developmental processes.

3.2 The Research Design

Lemke (1998) argues that discourse analysis is best applied when the research examines a particular community in depth. With this in mind, the research was conducted in a junior high school in Israel, where a school-wide mentoring model methodology was being formulated and implemented.

3.2.1   Participants

The research population included 27 school staff members (Figure 3.2) comprised of a management team (the Head-teacher and two management members (one of them was a subject coordinator), 8 subject co-ordinators (5 of whom were intensively involved) and 17 teachers (9 of whom were intensively involved).

General Assembly
N -27

Teachers	**Management team**	**Co-ordinators Subject**
N - 17	**N- 2**	**N- 8**
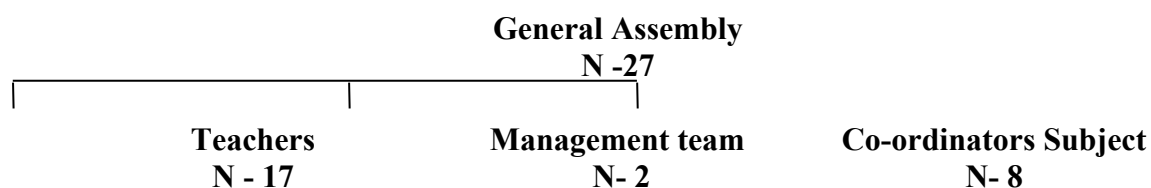
(19 participated in individual/group guidance through the mentoring discourse (

Figure 3.2: Research participants

3.2.2   Research questions

The research questions, as stated in the first cycle of this study (Sub-section 1.2.2) were refined through its second and third cycles to include the following:

<u>Central question</u>:

What impact does the mentoring model have on teacher empowerment?

Sub-questions:

a. What impact does the mentoring model have on the development of the teachers' metacognitive knowledge when mediating the learning of thinking skills?

b. What impact does the mentoring model have on the development of the teachers' metacognitive skills when mediating the learning of thinking skills?

c. What impact does the mentoring model have on teacher satisfaction and sense of self-efficacy?

Two <u>secondary questions</u> arose as a result of the secondary and tertiary analysis of the findings:

a. What impact does the mentoring model have on the empowerment of the organisation?

b. What impact does the mentoring model have on the empowerment of the mentor?

3.2.3 Design of the mentoring programme

The mentoring programme took on a form of a school collective activity. Its action plan was conducted within the framework of a 56-hour course each year, which continued through three years starting in September 2001 through September 2004. The learning content of the course at the early stage of the first cycle of the study related to alternative teaching strategies. Following several turning points during the first year, the learning programme's direction was changed from general exposure to teaching strategies to a process focused on a collective activity for developing a teaching strategy in the domain of mediating thinking skills. This topic, within the teacher professional programme, was chosen by the teachers themselves and is consistent with current reforms that demand the development of skilled learners who can cope successfully in a rapidly changing world (Resnick, 1987; Perkins, 1992; Wells and Claxton, 2002, Claxton, 2008). The MM enlisted this context towards the empowerment of teachers.

Each year's 56-hour course (there were a total of 168 hours throughout this study) were synthesised into ten sessions occurring once every two weeks (totalling 40 hours with the participation of the entire staff in the general assembly), and weekly mentoring sessions held with the staffs of the various subjects (totalling 16 hours). In addition to the course, individual guidance was offered (during the mentoring day which took place once a week).

The Mentoring Model
Programme and Process
An inquiry-based reflective discourse

Staff meetings

General assemblies
for the entire school
staff
(56 hours per year)

Subject
coordinator
and
management

Head-teacher
and
management
team

**Individual
guidance** for
subject
coordinators and
the Head-Teacher

Participant
Observation

Focus-
groups

Individual
Interview

Mentor's
Self-study

Methods and tools
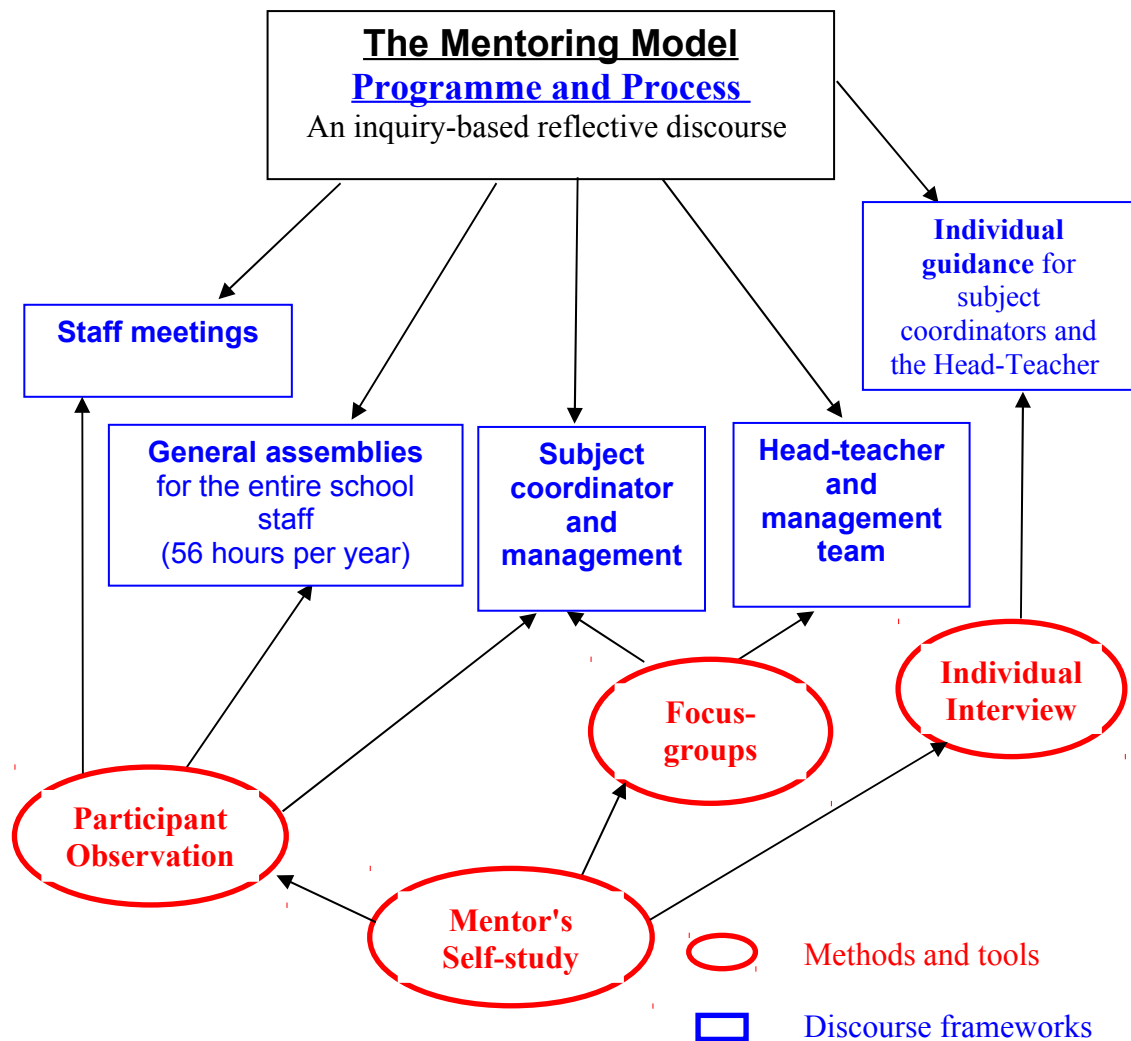
Discourse frameworks

Figure 3.3:   School Mentoring Model – An inquiry-based process

The structure of the research design was similar throughout the three years of study
Guidance of Learning Processes along the Learning Cycles Plan and
(Figure 4.2), but its detailed layout varied in relation to the school dynamic and
individual/organisational ZPD

unanticipated events.

Two principal axes give shape to the mentoring model through which the process of data collection was performed:

1. An <u>action programme axis</u> through which a method for systemic mediation of thinking skills as well as an action research approach to planning and evaluating the mentoring programme were executed.

2. A <u>mentoring process axis</u> characterised by reflective discourse, employing a self study approach.

Both axes were conducted in a way that allowed reciprocal interactions between data collection and interpretation.

This discourse activity brought about the evolution of the mentoring programme, where a systematic method for skills instruction (mediation) generated the development of a school curriculum for teaching/mediating skills. My self-study, as mentor, interacted with the school action programme and enabled reflexivity. According to Bryman (2001), self-conscious awareness is valuable as it enables the practitioner (e. g., the mentor) to assess the effects of his or her activities, as a participant and researcher.

In the first cycle, which advanced through two academic years, the action research was applied as an instruction strategy. The inquiry process, though based on the school activity and discourse analysis, lacked the systematic approach to data collection and analysis employed in the subsequent second and third cycles. The data collection and analysis processes were made more rigorous in the following ways: by setting a fixed schedule for the focus group meetings and for the collection of data; by directing collaborators attention and efforts on intensive implementation and collective evaluation; and by ongoing micro-level data analysis at the level of an individual teacher or group, and macro-level analysis of the school organisation.

3.2.4 Research methods and techniques for data collection

The following methods were designed to collect data but some of them were demonstrated upon their use as being productive for developing knowledge or assessing it (Table 3.1):

3.2.4.1 Participant observation

My participation as a mentor-researcher in the school plenary and disciplinary team meetings resembled the degree of participation of the 'observer-as-participant' (Cohen, Manion and Morrison, 2000, p. 310). In this context, the group is familiar with the researcher. In addition, Morrison (1993, cited in *ibid*, p. 311) argues that when the researcher is being immersed in a particular context for substantial period of time, 'not only will the features of the situation emerge and present themselves but a more holistic view will be gathered of the interrelationships of factors' Such involvement, which was mediated through the mentoring reflective discourse, allowed the generation of dense data. This provided me with the opportunity for 'live' data gathering, taking place in real learning situations rather than in an indirect form (Patton 1990, in Cohen, Manion and Morrison 2000). Participant observation allowed data gathering and facilitated learning processes through interactions in reflective discourse.

Table 3.1   Research Methods and Techniques

3.2.4.2 Interviews

a.   Focus groups

Focus group technique is a form of group interview based on selecting several participants for the purpose of discussing and exploring a specific topic in depth (Bryman, 2001). Two groups, one of which was the management team and the other consisting of the subject coordinator teams, provided the research with available informants (three management members , which included the Head-teacher and two management members, and eight subject co-ordinators which included one member of the management team (Figure 3.2).

While difficulties were encountered in allocating time for mentoring all of the teams through the inquiry process, the co-ordinators and management groups did manage to meet on a monthly basis. Their fixed schedule, which reserved time on the school agenda for pedagogical meetings, were utilised in this study as a framework for conducting interviews. In addition, members of the two groups were involved in leading the specific topic under research (Merton 1956, cited by Bryman, 2001), which made their participation valuable for meeting the research goals. Joint interviews of the two groups at the beginning and end of each research cycle ensured their involvement and that the school leadership would be responsible for the results.

Characteristics of qualitative research embedded in such interviews (Kvale, 1996, in *ibid*) overlapped features of the socio-cultural approach to researching learning and development. These focused on negotiating and interpreting meaning, and were aimed at sensitively conducting a reciprocal learning interchange that yielded changes in insight. In addition, Kvale (*ibid*) supports the emphasis on the emotional aspect of teacher learning, suggesting that the interviewer establish an atmosphere where participants can freely express their views. This social context elevated the participants' metacognitive thinking, as it turned their reflective processes into observable forms. Language used through interviews provided opportunities for understanding and shaping the teachers' metacognitive developmental processes, since if 'direct communication between minds is impossible…thoughts must pass first through meanings and then through words…[and] itself is engendered by motivation, i.e., by our desires and needs, our interests and emotions' (Vygotsky, 1962, p. 150).

Through these interviews, decisions were made that directed curriculum development or structured the teachers' learning environment into one of a learning organisation (Senge, 1990). The focus group involvement and support throughout this study was assumed to provide participants with sense of responsibility as well as a stake in the research goals.

Moreover, the groups' heterogeneity, which embedded different levels of the school hierarchy (management and teachers) as well as their interdisciplinary outlook, added different perspectives to the research findings. It allowed multi-voiced discourse, which afforded me as a mentor and a researcher the opportunity to study the ways 'individuals [teachers] collectively made sense [of their practice by mediating the development of thinking skills] and constructed meaning around it' (Bryman, 2001, p. 338).

b.   Individual interviews

Interviews were also conducted with members of the focus groups, the subject co-ordinators and the management team members (which included the Head-teacher). Individual interviews were intended to reveal personal aspects that did not find expression in the focus groups. They allowed further openness as well. In doing so, they also afforded mentoring at the level of each individual's ZPD. These interviews provided an understanding of individual and group perspectives and were used for re-assessing and re-designing the action research framework as well as for assessing the teachers' progress.

Interviews combined different strategies, which followed the rule of 'fitness for purpose' (Cohen, Manion and Morrison, 2000, p. 270):

- Unstructured interviews

    Questions were focused on the topic of the teachers' learning and knowledge development, and were directed toward the formation of new insights and awareness (Kvale, 1996, in Cohen, Manion and Morrison, 2000). The interviews allowed an exchange of views between collaborators guiding concept formation through the cyclical development processes. Flexibility in managing these processes was aimed at gaining meaning of teachers' progress from intuitive to metacognitive teaching.

- <u>Semi-structured interviews</u>

  Interviews are not a structure commonly used by teachers for conversing. It was assumed and later supported by data that research jargon as well as formal, structured interviews would spur a negative reaction in teachers and cause them to withdraw. These were significant barriers to teacher learning that I hoped to avoid. Instead, these semi-structured interviews were more like informal and at time semi-formal conversations, allowing flexibility and adaptability to the way interviewees explain and understand events or forms of behaviour (Bryman, 2001). Several questions were planned in advance, including some that aimed at clarifying meanings aroused through the interview or derived from the previous cycle of data analysis. This method enabled group interaction through the evaluation, reflection and planning processes that took place in the co-ordinators and management group interviews at the beginning and end of the second and third research cycles.

c.   Teacher constructs

Materials that the teachers used or constructed were used as a source for data and aimed at revealing progress and issues for further discourse and improvement.

3.2.4.3   Data collection techniques

a.   Personal journal

The researcher's log or reflexive journal (Ely et al., 1991) was a central tool for data collection and analysis as it "contains the data upon which the analysis is begun and carried forward. It is the home for the substance that we use to tease out meanings and reflect upon them as they evolve." (*ibid*, p. 69) I kept a personal journal throughout the period 2002-2006. It included field notes taken while observing or interviewing teachers as well as documentation of my thoughts.

During the first two cycles it served to document the field work in general and for tracking retrospectives, thoughts and events. In the last two cycles it was more

intensively and frequently used as a reflexive log, as well as for documenting events when note writing was inappropriate (as in informal conversation with a teacher). In addition, it was valuable for data collection when audio/video taping was unavailable or inconvenient.

Throughout the pilot and the first cycle of this study, the use of recording devices was limited, as I was aware and sensitive to the teachers' feelings of intimidation when being examined (as well as honouring some teachers who rejected the use of this technology). In other cases, the taking of notes throughout the mentoring sessions and shortly after informal incidental conversation was my main strategy. This approach was more appropriate in the school's culture where audio- or video-taping is not common and is particularly intimidating for teachers. In a fact-based era, where teacher work is continuously measured and judged, building their trust in the mentor and encouraging their openness was far more important than the possibility of losing data. Nonetheless, towards the end of the third cycle, when trust and confidence had been built, few co-ordinators, as well as the head-teacher, were willing to be taped on audio and video.

b.   Written reflections

The teachers in this study, especially at its initial stages, were less reflective and were laconic in communicating their thoughts, so that data collection through dialogues was found inadequate. The teachers' limited time did not allow me to conduct long intensive interviews through which to encourage their verbal expression. In addition, the teachers' heavy work load and focus on action did not encourage them to invest time in keeping a personal journal. Written reflection was thus a valuable tool. Through it, teachers wrote their feedback and reflection on their learning and implementation experiences. Such writing took place at times at the end of the general assembly session or at the end of individual/staff mentoring sessions. It served as an additional channel to communicate with the teachers as well as a means of fostering their metacognitive thinking. As Vygotsky (1962, p. 144) explains: 'The speed of oral speech is unfavourable to a complicated process of formulation – it does not leave time for deliberation and choice.' In addition, since

'In written speech…we are obliged to use many more words, and use them exactly' (*ibid*), teachers were afforded a channel through which to elaborate on explicit words that fostered awareness and the development of declarative metacognitive knowledge. This also mediated concept formation through meaning negotiation, since when writing '…Thought must pass first through meanings and then through words' (Vygotsky (*ibid*, p. 150). This way, the teachers' attention was directed to making sense of their experiences, while at the same time developing their reflectivity. Moreover, written reflection was used to evaluate metacognitive development as written speech 'reflects our mental process.' (*ibid*, p. 144)

c.   Field notes

Field notes served as additional technique for data collection after the observations took place. These were a useful substitute for audio or video recordings during observations which seemed to trigger teacher 'reactivity' (Cohen, Manion and Morrison, 2000, p. 313). Their use took into account the request of some teachers who felt intimidated by such technologies and thus enhanced trust in the mentor-collaborators relationship. (Towards the end of the research, two empowered co-ordinators as well as the head-teacher, invited me to record our final sessions).

3.2.5   Data analysis

Studying the impact of the MM on teachers' metacognitive development required a methodology whereby this process could be analysed through the history of its progress and in its multifaceted context.

3.2.5.1 Defining the Unit of Analysis

Several principles in Engeström's (1987, 1999) model for analysing collective learning activity provided guidance through which to assess changes resulting from the MM's joint activity (see Sub-section 2.2.1).

The System Components
(The **subjects** in the collective activity)

Learning Interaction
Caused by Factors in the activity system
(Constituting the Mentoring Model)

Teacher

Organisation

Mentor

Mentoring Programme

Mentoring Process

Objects - developing teachers empowerment
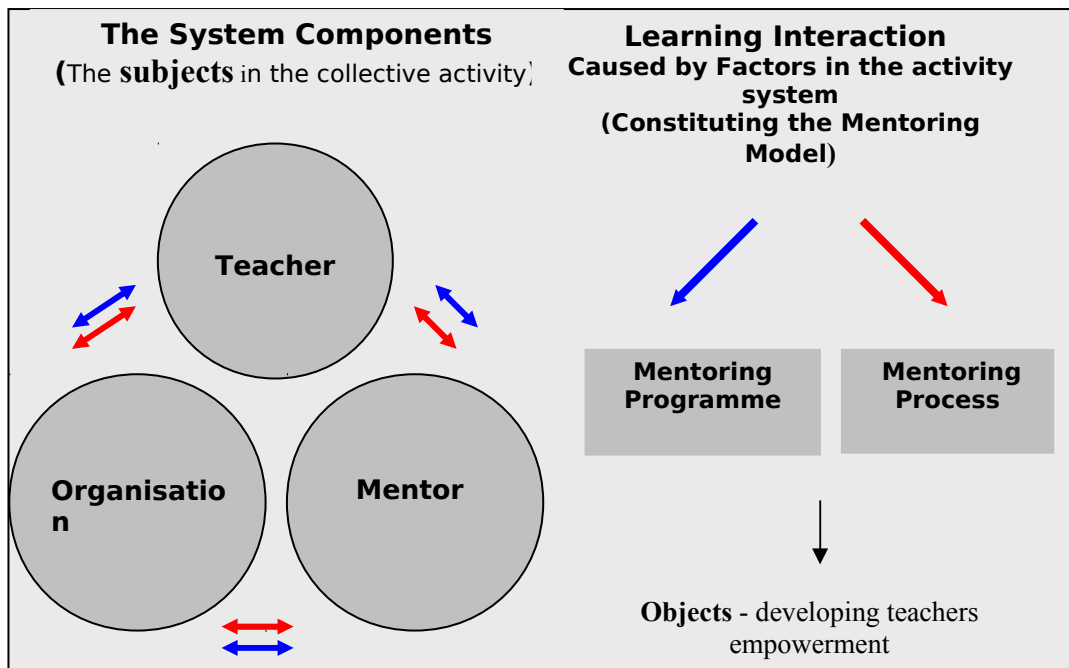
Figure 3.4   Unit of Analysis – System Components and Factors for Learning Interaction. (Appropriation of Engeström's model, 1987**).**

This model clarified the role of conflicts and contradictions provoked by power and control relationships as part of such a developmental mechanism. It assisted me in highlighting the relationship between mediating tools provided by the MM and teacher metacognitive development, and by organisational and mentor empowerment.   Nevertheless, this study did not adopt the different levels of analysis offered by Engeström as it would have unduly complicated the research process. Similarly, Yamagata-Lynch (2007) claims that using this method made her work more complicated. Others claim that alternative methods are preferable as they examine data and communicate in more simple terms (*ibid)*. Consequently, the model was appropriated to fit the research as an overarching analysis framework (Figure 3.4). It related to the basic concepts of subjects, objects and interacting cultural factors (tools) provided through the MM. Discourse, as one of the activity vehicles, offered a productive path for the merging of several analytical tools, to which I turn now.

3.2.5.1 Discourse analysis

Data analysis involved qualitative methods which are 'inevitably interpretive' (Cohen, Manion and Morrison, 2000, p. 282). Giles (2002, p. 185), claims that although discourse analysis and grounded theory are similar qualitative approaches, the former does not 'rule out the use of previous theory or literature in guiding the research'. Likewise, in this study, interpretation was guided by the research conceptual framework, where categories were drawn through interactive process between data and several theoretical perspectives (such as concept formation, empowerment, metacognitive development, learning organisation). This dynamic, which served to gain meanings from developmental processes at the level of the teacher, organisation and mentor (which defined the system under inquiry), follows principles of discourse which involve exploring word meanings; 'semantic analysis - the study of the development, the functioning, and structure of this unit, which contains thought and speech interrelated' (Vygotsky, 1962, p. 5). In addition, discourse analysis in this thesis relates to context and activities in addition to verbal text. Thus, emphasis was placed on exploring cognitive (e.g. metacognitive development) and interactive (e.g. power relationships) aspects of developmental processes. Edwards (1980, in Cohen, Manion and Morrison, 2000) supports such an approach, as it reflects power relationships embedded in the discourse. Consequently, an assortment of techniques was used, affording me a variety of perspectives through which to interpret the findings.

Lemke (1998) views comparison as basic to discourse analysis, where data analysis ought to relate to a variety of angles from which to construct and contrast information. Analysis in this study thus focused on: a).verbal data, where dialogues take place through multiple level ZPD interactions (e.g. mentor/teachers, and among teachers) and b) teacher products (such as curriculum development, performance tasks, tests, rubrics). Relating to these products as part of the discourse was compatible with the model's holistic approach to the teachers' professional development. In this way, the analysis compared teaching, learning and assessment which allowed the identification of possible contradictions (Engeström, 1987, 1999) between teaching goals and actual practice. It evoked 'creative tension' (Senge, 1990)

which led to the school's engagement in new learning cycles. While being sensitive to the school's contextual activity, the discourse also related to national and global characteristics of the educational system of which teachers are a part, 'the wider context of cultural norms and assumptions, knowledge, beliefs and values' (Lemke,1998).

Moreover, Lemke maintains (*ibid*) that analysis and interpretation of discourse data itself constitutes more discourse, comparing the researcher's point of view with other perspectives. These notions are compatible with the MM's holistic approach, where the method is both the tool and the result of the study (Vygotsky, 1962). Likewise, mentoring processes which took place between the school staff and me constituted a 'contextualised dialogue… [where] discourse itself is the educational reality' (Edwards and Mercer, 1987, cited in Cohen, Manion and Morrison, 2000, p. 300).

Kemmis and McTaggart (1992, cited by Cohen, Manion and Morrison, 2000) ascribe to the language and discourse activities characteristics that define the group culture. Thus, interpretation of teachers' verbal expressions and gestures served throughout this study to indicate change in teacher development and to assess the impact of the MM on such growth.

3.2.5.2 Analysis techniques

Various techniques are used in discourse analysis (Blanton, Moorman and Trathen, 1998). The following list presents the main tools that were used to assess developmental processes indicating teacher and organisational empowerment:

1. Analysis of word meanings employed various criteria: a) *external, egocentric and internal speech* (Vygotsky,1978) indicated the level of teacher conceptualisation of the mediation process (see Sub-section 2.2.2.2) *declarative, procedural metacognitive knowledge* and *self-regulation* indicated levels of growth in teacher knowledge and skills.

2.   The following tools added visual representations to the evaluation process. These assisted me in analysing data and organising it in a way that fostered understanding of developmental processes.

Kolb's (1984) learning cycle, served to analyse the teachers' level of implementation (Figure 3.5.), where higher levels indicated engagement in innovative, proactive pedagogy. Kolb's (1984) experiential learning model (Figure 3.5) served the MM in planning and assessing progress at different levels of the school collective activity (teacher, mentor, organisation). Similar to action research, this experiential learning model conceives the process of learning as including action and reflection. Its four-stage cycle includes: experiencing, observing-reflecting, conceptualising, and implementing. Its integration throughout the research provided me with a systematic instructional tool that mediated the planning and assessment of the many small cycles involved in each of the three main cycles. It assisted me through the mentoring process in planning scaffolding activities and in assessing growth in the teachers' levels of conceptualisation. The latter was manifested by metacognitive development within each teacher's ZPD. This strategy is strongly supported by Schön (1983, 1987), who argues that systematic reflection is an effective way for practitioners to learn since it has the potential for increasing the amount they consciously learn from their practice.

The rubric tool (Figure 4.2) was used for analysing the teachers' developmental process through its reconstruction; the way teachers reorganised the rubric's categories and redefined and crystallised performance criteria indicated an expansion of declarative and procedural knowledge involved in a specific skill performance.

Second stage (loop) Examining insights in a new context, on a creative, inventive level.
First stage (loop) Implementation in the classroom.

Stimulus Relevant needs Active event (Through the mentoring discourse, class interactions)

Experience

Application

Kolb's Learning Cycle (1984)

Reflection

Conceptualisation

Constructing meaning Conceptualising mediation through analysis and synthesis processes (e.g. redefining rubrics categories, criteria)

Reflecting on action, and in action Throughout the different levels of the cycle; Through team or individual sessions

Figure 3.5: **Kolb's learning cycle** **(as adapted for this study)** 117

Second stage (loop)
Examining insights
in a new context, on
a creative, inventive
level.
First stage (loop)
Implementation in
the classroom.

Stimulus
Relevant needs
Active event
(Through the
mentoring
discourse, class
interactions)

Experience

Application

Kolb's
Learning
Cycle
(1984)

Reflection

Conceptualisation

Constructing meaning
Conceptualising
mediation through
analysis and synthesis
processes (e.g.
redefining rubrics
categories, criteria)

**Reflecting on
action, and in
action**
Throughout the
different levels
of the cycle;
Through team or
individual
sessions

**Figure 3.5:   Kolb's learning cycle
(as adapted for this study)**

An analysis tool – indicating teacher reliance on thinking strategies when
mediating pupils' thinking (Table 3.2). This instrument evolved through
this study and was used to analyse teachers' levels of reliance on intuitive
(based on Claxton, 2000) and metacognitive thinking strategies (based on
Pintrich, 2000) when mediating thinking skills (See examples in
appendix 6).   Expansion of metacognitive characteristics indicated
growing levels of empowerment. It is important, however, to stress that
the different criteria at each developmental stage (Table 3.2) served as
guidelines for mentoring the teachers' developmental processes within

their individual ZPDs rather than as strict measurements. These guidelines were tentatively integrated as benchmarks within the teachers' ZPD.

In addition, the analysis that was derived from this instrument was used to compare the teachers' (subject co-ordinators') relative reliance upon four thinking strategies involved in skills' mediation (Figure 4.3). In order to visualise the pattern of teacher growth, a qualitative scale (from low to high, through five stages) defined the level of reliance on each thinking strategy (relative to each teacher and among them).

3. **Participant structure** technique was used in this study to analyse patterns of interactions (Wertsch, 1985, in Zellermayer, 2004) among teachers, between mentor and teacher, between teacher and pupil (based on the teachers' reports), and between the teachers and Head-teacher. This technique refers to the way participants speak to one another and about one another by showing the way participants are positioned with relation to each another (as passive vs. active, reactive vs. proactive or in power relationships). This technique assisted in evaluating developmental processes at the level of teacher and organisation empowerment.

Table 3.2: Analysis of reliance on thinking strategies – characteristics of thinking strategies involved in mediating thinking skills.

Intuitive Thinking	Metacognition (thinking about thinking)			
	Metacognitive knowledge			Metacognitive skill
	Declarative knowledge	Procedural knowledge	Advanced levels of procedural knowledge*	Self-regulation
Employing previous knowledge usually occurs without conscious control. 'Book oriented' planning Decision making based on 'feelings'. Sensitivity to clues. Exhibiting creativity in problem solving. Grasping the structure of the whole. Intuitive knowledge accessed in a relaxed mood. Learning by doing, using professional instinct.	Knowledge of **'what'** – what is the task (naming concepts), what cognitive strategies may be integrated in the learning process. *(e.g.* awareness of personal knowledge in reference to the task and the relevant strategies involved.)	Knowledge of **'how'** to apply cognitive strategies effectively. (e.g. conducting a dialogue with the text, extending memory). Knowledge of how to mediate the progress of pupils through gradual sequence. Knowledge of the appropriate strategy for assessing pupil's progress.	Knowledge of **'when'** and **'why'** to apply the different cognitive strategies (related by Pintrich as conditional knowledge,2002) (e.g. clarifies ways of reaction in relation to pupils' readiness to phrase a conclusion after making a comparison Considering appropriate mediation for advancing pupil performance. Clarifies decisions made in reference to teaching procedures.)	**Forethought-** Goal oriented planning. Higher awareness and use of declarative and procedural knowledge of mediating skills. **Monitoring** of efforts, time use, help needed, and changes required *in task and context.* Engaging in continuous dialogical learning with colleagues and pupils. **Controlling** – actual acts of selection and adaptation of thinking and management strategies. Reaction and reflection: applying cognitive judgement; evaluation of task and context; affective reactions; choosing reaction.

3.2.6   Triangulation

Triangulation in its original literal sense relates to a physical measurement technique (e.g. used by military strategists), where several locational markers are used to pinpoint a single target (Cohen, Manion and Morrison, 2000). Applying a multi-method approach in social research similarly aims at creating a triangulation technique.   According to Cohen, Manion and Morrison (*ibid*), triangulation techniques are suitable for research applying a holistic view, as in this study, for the teachers' developmental process since it affords various angles by which to study the complexity of human behaviour (*ibid*).

Various kinds of triangulation were used in this study relating to data collection and analysis. Data was based on the school's mentoring discourse that drew on diverse standpoints that included linguistic as well as contextual events. These standpoints assisted in mapping out different aspects of the teachers' metacognitive developmental processes.

Discourse analysis, as described in the previous section, corresponds with Denzin's extended view of triangulation (1970, cited by *ibid, p.* 113). Thus, this study included:

- *Time triangulation* of data which was gathered at each cycle of a three years study that represented the teachers' developmental process as well as progress in the organisation through different stages.

- Data collection at the individual, team and organisation level provided *combined levels of triangulation*.

- *Methodological triangulation* was also made possible; since discourse was used on different occasions (e.g. individual, group and organisational learning events), and different methods or techniques were used to analyse the teachers' metacognitive development (through discourse analysis, construction of rubrics and participant structure).

- *Theoretical triangulation* was employed with the use of alternative theories, providing me with various lenses through which to make sense of the data. The various theories provided me with analytical tools such as Vygotsky's (1962, 1978) *socio-cultural theory*, which inspired techniques for analyzing word meanings as well as progress within the teachers' and organisation's ZPD; Kolb's *experiential theory* (1984), which offered a tool for analysing the teachers' level of implementation; and Engeström's (1987) theory of *learning by expanding*, which provided a framework for analyzing learning in a collective activity context.

These various theories enabled me to perform *analytical triangulation*, which Leech and Onwuegbuzie (2007) strongly advocate. These researchers contend that the concept of triangulation applies mostly to data collection. They highly recommend that it be extended to include two or more data analysis tools. Their claim is based on two rationales: 'representation and legitimation' (*ibid*, p. 579). Representation of the same results through different tools is assumed to 'get more out of the data' (*ibid*, p. 579), allowing the results to be interpreted more rigorously. At the same time, this approach in qualitative research affords legitimation, which 'refers to the trustworthiness, credibility, dependability, confirmability and/or transferability of the inferences made' (*ibid*, p. 580). Similarly, in this study, applying multiple data collection and analyses methods (Table 3.1) provided a way to validate data (*ibid*).

The next sub-section will present this additional aspect of systematic inquiry, where triangulation interacted in different ways that strengthened the validity of the present research.

3.2.7   Validity

Validity in traditional scientific research relates to the certainty that what is measured by the research tool is what meant to be measured (*ibid*). However, for Hammersley (1992, cited by Cohen, Manion and Morrison, 2000), in qualitative

studies the confidence in the results of our study replaces certainty. Validity in qualitative research assumes to be addressed through 'the honesty, depth, richness …scope of the data achieved… [and] the extent of triangulation' (*ibid*, p. 105). Multiple methods for investigating the same reality, when yielding the same results, add rigour to data and confidence in the research findings. Adding aspects of 'representation and legitimation', discussed above by Leech and Onwuegbuzie (2007), is assumed to strengthen the validity of the present findings.

Moreover, a detailed description of what actually happened in the research as presented in the findings chapter (Section 4.1) is assumed by Blumenfeld-Jones (1995, cited by Cohen, Manion and Morrison, 2000) to represent 'truth' in research. In addition, the consideration of appropriate research methodology that fits the school culture is assumed to add cultural validity (Morgan, 1999, in *ibid*). For example, some co-ordinators rejected the use of questionnaires as a means of evaluating their progress. From their experience, questionnaires were not likely to provide an accurate reflection of teacher performance, since teachers (at times unconsciously) tend to present themselves in a positive light. Their reservation is embedded in understanding the 'social desirability effect…' (Bryman, 2001, p. 123), where respondents tend to endorse answers which are perceived to be socially desirable. What seemed relevant for the teachers to test was what teachers actually do (the final products of teaching such as test scores, pupil projects and implemented strategies). Megginson (2000, p. 259) lent support to their recommendations:

> Questionnaires can take us so far into this world and give us systematic patterns of difference, but then we are still left with the question, `What do these differences mean?' **Access to the meanings behind the data** can most directly be gained by seeking out the stories of the participants. (Emphasis added)

Combined methods in the second and third cycle were thus aimed at adding rigour and depth to this investigation. This approach provided me with optimal feedback regarding the impact of the mentoring model on the development of teacher empowerment.

3.2.8 Ethical perspectives

Ethical and methodological considerations were a central issue that accompanied this study throughout its three stages. Engagement in the research received the teachers' consent and the results and conclusions were shared with all participants. It was agreed that participants could withdraw from the research at any stage. Under these circumstances, the element of pressure exerted on teachers to co-operate was irrelevant.

Collaboration with the school management and the teachers in order to meet common goals through the school enterprise lent strategic value to the planning and structuring of the methodology. Building the teachers' trust was essential and expressed one of the central characteristics of the mentoring process (see for example Sub-sections 4.2.5.2 and 4.3.1.3). Accordingly, data was stored in a manner that maintained the participants' anonymity and confidentiality (which also explains the aliases given to participants). This encouraged the research participants to express their thoughts and feelings openly, which provided a supportive environment for developmental processes. Conducting open dialogues throughout this study allowed transparency and provided opportunities to relate to both mentee and mentor perspectives. These dialogues maintained the credibility of findings and the validity of the research outcomes (Guba and Lincoln, 1985, 1994, in Bryman, 2001).

Moreover, the research collaborators were informed of the research plan, and their participant was conditioned on their consent. In addition, the research results and conclusions were shared and accepted by all participants.

Chapter 4 Findings

4.1 Introduction

> They craft their own theories of change, consistently testing them
> against new situations. They become critical consumers of
> management theories, able to sort out promising ideas from empty
> ones. They become less vulnerable to and less dependent on external
> answers. They stop looking for solutions in the wrong places. (Fullan,
> 1998)

The above lines explicitly mirror the dynamics which led to the present inquiry.
Step by step, Fullan's words sketch out the process through which my
philosophical, theoretical and methodological perspectives have unfolded.

4.1.1   Presentation of findings

This findings chapter is structured to present results from the three cycles of the
research (Figure 4.1). This sub-section aims at explaining the various considerations
involved in the way the findings will be presented, in particular, the manner by
which the preliminary discussion and findings were intertwined that was found to
be most appropriate.

Presenting the mentoring model (MM) as it was shaped and transformed through
the research's three cycles is assumed to be essential for understanding its impact on
teacher empowerment because 'problems and potentials can only be understood
against their own history...as local history of the activity and its objects, and as
history of the theoretical ideas and tools that have shaped the activity' (Engeström,
2001, p. 136-137).

The initial discussion of findings in this chapter aims at reflecting the authentic
dynamic dialectic that occurs between practical application and theoretical
perspectives as derived from the relevant literature. This made it possible to derive
meaning from the ongoing interpretation of the data in a real-time inquiry process.

Chenail (1995) strongly supports this approach, asserting that in qualitative research: "You have to juxtapose data excerpts with your talk about the data…and talk about the data is how you choose to use 'the literature' in this weave." Sharing awareness of the theories that guided my actions as a practitioner is considered essential for facilitators of change (Fullan, 1999). Thus, in contrast with the traditional separation of findings from discussion, here the two are intertwined.

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┌─────────────────────────────────┐
│      Findings Chapter (4)       │
└─────────────────────────────────┘
        ┌──────────┴──────────────────┐
┌─────────────────┐   ┌──────────────────────────────┐
│ First Cycle (4.2)│   │ Second and Third Cycles (4.3) │
└─────────────────┘   └──────────────────────────────┘
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| Impact of the MM on Teacher Empowerment (4.3.1) | Impact of the MM on Organisational Empowerment (4.3.2) | Impact of the MM on Mentor Empowerment (4.3.3) |

)Summary of findings (4.4

)Cross- analysis of the main findings (4.5
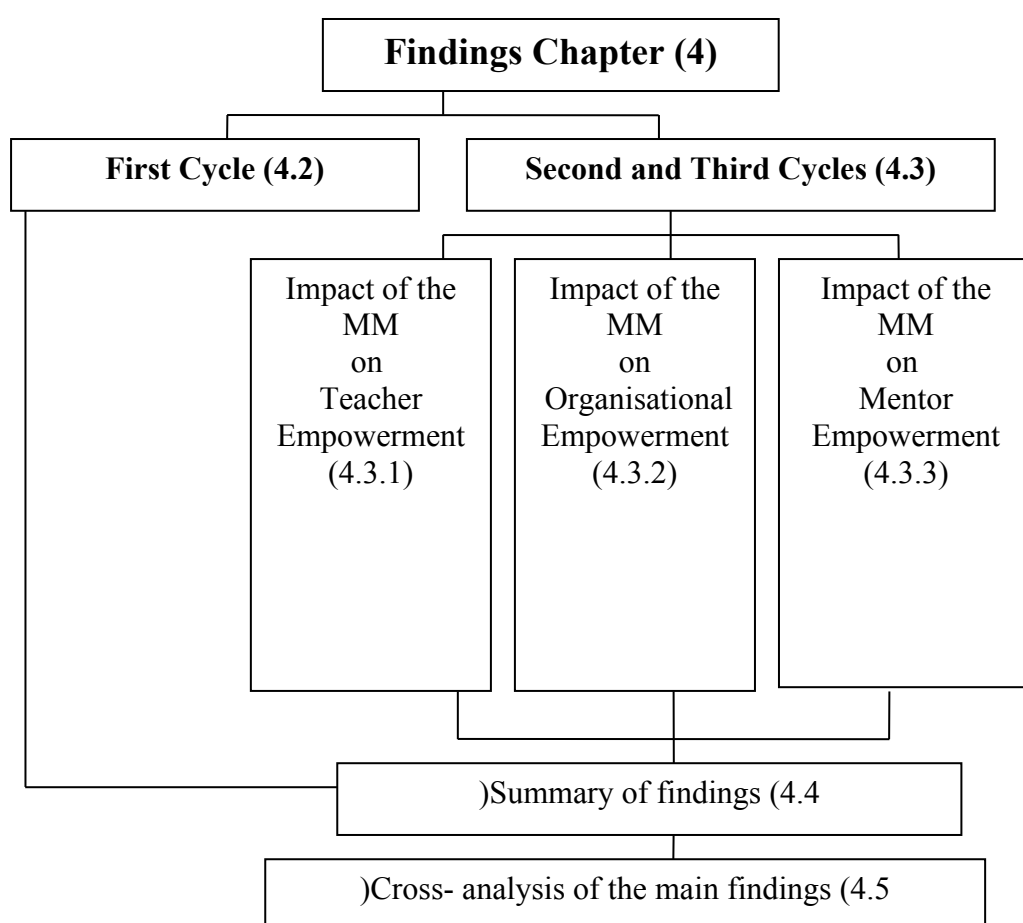
Figure 4.1:   Structure of the Findings Chapter

Furthermore, the inclusion of a preliminary discussion in this chapter serves my intention of sharing the path by which I have developed my theoretical perspective and methodology, and which modified the rationale for the mentoring model. Giles (2002, p. 191), specifically addressed this issue by stressing that in qualitative research the results and the discussion ought to merge together, since much of the

analysis needed 'extensive commentary'. Moreover, in qualitative research data collection 'is less easily abstracted from the research process' (*ibid*, p. 185). Quoting the teachers' discourse served throughout this chapter to mirror the way verbal data directed interpretation, guiding mentoring effectively to foster metacognitive developmental processes. In this way it met Fullan's (1993) recommendation that 'The goal of greater change capacity must become <u>explicit and its pursuit must become all-out and sustained</u>' (*ibid*, p 5, emphasis added). Bryman (2001, p. 83) refers to this point by arguing that the lack of transparency is "increasingly being addressed by qualitative researchers." Research reports present findings without exposing the process of "how he or she arrived at the study's conclusion… [and it is] often not obvious how the analysis was conducted" (*ibid, p.* 83), or what obstacles that the researchers had to overcome. Accordingly, I chose to present the findings in a way that reflects different aspects of my philosophical, theoretical and methodological approach.

Findings of the first cycle will be presented along a chronological continuum. I begin with a description of my entry as a mentor into the school and describe the stages through which the productive relationship that developed between me, as a mentor, and the school staff evolved. The presentation will attempt to reflect the ongoing process of data collection and interpretation, where literature was a significant source for gaining meaning.

The findings for the second and third cycles emphasise the additional methodological rigour employed in this study at micro and macro levels of analysis (ranging from the individual coordinator, through single subject matter teams and the entire school staff). It also presents findings in which data was derived from various analysis techniques (e.g. participant structure and levels of metacognitive development within each teacher's ZPD).

Thus, my approach is to provide a detailed presentation of the thinking processes that were aimed at challenging paradoxes, tensions and motivating actions. These

took place through the ongoing discourse between the learners and me and reflect the practical and moral value referred to by the exposure of:

> the habits and skills required – to engage in continuous corrective…
> analysis and action…the ability to survive the vicissitudes of planned or
> (unplanned change while growing and developing. (Fullan, 1993, p. 5

The above considerations characterise various trends in the social sciences, among them the postmodernist approach (Bryman, 2001). They support a 'dialogic' form of writing that seeks to raise the profile of the multitude of voices that can be heard in the course of fieldwork (ibid, p. 469). Accordingly, they are "...shaped by interactions between informants or 'the other' and the observer'" (Manning, 1995, cited by Bryman, 2001. p. 470).

4.2 First cycle – Evolution of the Mentoring Model

4.2.1   Questions that guided my inquiry

My principal concern was how to stimulate the teachers' interest and motivate them toward innovations that would be applicable to their teaching programmes.

This main concern led to another question: <u>How can I promote teacher learning activity that combines their efforts with job satisfaction in a way that would respond to their needs?</u>

These questions focused my attention on searching for ways to arouse the teachers' interest and curiosity throughout the mentoring programme. My assumption was that the additional workload of the mentoring programme, as well as the pressure that characterises learning processes, would be rewarded by an increase in teacher

satisfaction and professional growth, as well as in facilitating their pupils' achievements. Thus, a search for an empowering framework for teachers began.

4.2.2   First Steps – A constructivist approach to teacher learning

4.2.2.1 Building trust – linking up with the Head-teacher's needs

The initial meeting with the school's Head-teacher was critical in order to permit my entry into the school. Because of the fact that he was strongly involved in directing pedagogic processes in the school, it was necessary to seriously consider his ideas of the school's needs. He emphasised the need for the provision of tools and teaching strategies to cope with the learning needs of the heterogeneous pupil population in his school. Providing him with a clear definition of my area of specialisation (see Appendix 3) as a response to the gap that he had identified in teacher knowledge later proved to be important because it correlated with his own goals. This facet of my entry into the school, which enabled me to bond with the Head-teacher and his teaching staff, is an essential characteristic of the qualitative researcher. According to Lincoln and Guba (1985 p 201), the Head-teacher as the 'gatekeeper' legitimises the access to the studied phenomena.

To a certain extent, a school constitutes a closed community that sometimes has to defend itself against the outside; the educational system authorities and society are perceived as demanding and often threatening for Head-teachers and their staff (Arieli and Shachor (2003). Similarly, as a mentor, I represent these outside forces that might expose weaknesses of the school and its teachers. My awareness of these views, based on my personal experience, led me to adopt a strategy of relating to the Head-teacher in a sensitive and respectful manner, while working towards establishing a MM with clear and common goals.

The first meeting with the Head-teacher created an informal contract, whereby we defined the dimensions of the 'door opening' agreed upon for my entry. At the same time, I intended to allow the school staff, by choice, to enlarge and modify the dimensions of my intervention. At the end of this meeting, I was invited to meet with the leadership team, described by the Head-teacher as a forum of subject (teaching discipline) co-ordinators who participate in pedagogic decision-making. I knew that this staff, along with the Head-teacher, posed a serious challenge and I wanted to succeed in building relations of trust. In this regard, Lincoln and Guba (1985) note:

> The building of trust is a developmental task; trust is not something that suddenly appears after certain matters have been accomplished ('a specifiable set of procedural operations'), but something to be worked on day to day. Moreover, trust is not established once and for all; it is fragile and even trust that has been a long time building can be destroyed overnight in the face of an ill-advised action. (p. 257)

4.2.2.2   Linking-up with the needs of the leadership team

During the first meeting, Avi, one of the co-ordinators, asked: 'What is your goal for this mentoring programme?' (Personal Journal, October 25, 2001)

I noted that this question embodied a combined tone of reservation and suspicion. My interpretation of his question was that mentors are considered by many teachers as specialists and professionals who come to determine their agenda. Accordingly, together with my intention to create an open and transparent dialogue, I answered:

> Based on my perception of the mentoring process, you, the co-ordinators, together with management, dictate what the desired goal is, as those who know the pupils and their work. I will do my best to assist you, using my expertise in planning curriculum that combines learning strategies and skills. (Personal Journal, September 25, 2001)

Based on my past experience, I was determined to create a foundation for learning that would emphasise their stake in the mentoring programme.

4.2.2.3   First engagement of participants in learning cycles

Emphasising the centrality of the Head-teacher and staff set the cornerstone for the mentoring programme. My assumption was that a sense of trust and confidence would be created when the teachers, along with the school's management, bonded with an activity directed toward realisation of a shared vision (Senge, 1990). These assumptions were corroborated by many teachers in my previous mentoring programmes as essential for a learning environment.

During this meeting, a decision was reached that was compatible with the vision of the Head-teacher. The intention was to form a framework through which teachers would learn alternative teaching strategies and would then be guided to apply them in their classes.

The mentoring programme was designed to guide the teachers' learning processes through their immersion in reflective experience. My premise was that exposure alone to a variety of learning strategies is not sufficient to bring about a breakthrough in perceptions and teaching methods. As Kolb claims (in Wallace 1999), learning becomes more effective the more that teachers reflect on the complete cycle (Figure 3.5). This assertion was compatible with my belief that the teachers' learning environment ought to enable teachers to engage in continual cycles of learning.

At this stage, I joined the teachers and managerial staff in planning an action programme on the subject of teaching strategies. Throughout my mentoring sessions several tools were introduced to teachers for planning instructional goals. The central one was Kolb's learning cycle (appendix 4) which assisted me in planning the teachers' learning activities, while helping the teachers become aware

of the need for planning and focusing on their pupils' learning needs. My intention was that neither the textbook nor the sequence of existing lessons would dictate the learning programme, but would rather be determined by the teachers' defined goals.

4.2.3   First turning point

> Change is ubiquitous and relentless, forcing itself on us at every turn.
> Fullan (1993: VII)

I found Fullan's description (1993) of the change process relevant as a reflection of the dynamic I experienced, in this study, almost two decades later. The following development will describe the occurrence of a turning point in the programme, which took place at the end of the fourth session of the general assembly. It had implications for the subsequent action programme in the pilot study and for the entire research process. Thus, the intention of this sub-section is to trace the dynamic that accompanied the initial steps leading to this change.

At this stage, although the school staff determined the mentoring topic, I was responsible for the planning of the mentoring programme and for providing the principal research resources (collection of data and its analysis),

My analysis of the teachers' reflections, written at the end of the fourth session, indicated that teaching strategies were being used sporadically and unsystematically. The teachers were being exposed to new stimuli (innovative strategies such as learning in groups and communication strategies through the Open University workshops). However, these strategies had not yet become an integral part of the teachers' learning cycles and were inadequate for promoting significant change in their teaching/learning methods. Despite signs of interest and enjoyment, they did not apply the learned activities in their classes. The following statement is one of several that indicated the lack of usefulness of their learning activities:

> The activity is nice and important. I enjoyed it. I hope that it will be possible to impart it in class. Although not at this stage, perhaps later. (Written reflection, November, 2001)

Based on my early experience as a teacher and the reports of many other teachers with whom I have worked, when pupils complain that 'it's boring…not interesting…we've already learnt that,' it is taken as an indication of their lack of motivation for learning.

At the end of one of the sessions with the Open University, some teachers approached me and shared their feelings and thoughts about the course. One of them said:

> Look, we really enjoyed what we did with you in the first two sessions. It was very relevant…you talked to us as a fellow teacher…those sessions [with the Open University] were satisfactory, interesting, but it's not exactly something that you would use all the time [in class]…If it continues like that, it doesn't seem to me that you'll see some of the teachers here again. (Field Notes, 2001)

The teachers' expressions of a lack of interest and motivation to find ways to apply new methods in their instruction were previously interpreted by me in a way similar to the way teachers often react to their pupil's lack of success: 'the pupil is lazy' or 'doesn't make an effort'. I had reached similar conclusions from past experience regarding teachers who did not apply what they had acquired in my course. However, at this point, my constructivist approach to teacher learning helped me abandon this judgmental attitude. Thus, equipped with a wider perspective, I began to view their reactions differently, instead of concluding that it was due to their lack of motivation to change or spend time and effort on innovations.

An alternative way to understand the teachers' reactions is to relate to them as a stage of dependence at which the group projects responsibility on the leader (Bion, 1961). According to this approach, the teachers may have projected onto me the

image of someone who knows what is correct, what should be done, and even be able to set the limits and direction of the development programme.

The teachers' reactions to the course were shared by the Head-teacher. Consequently, I was asked to steer the programme toward the realisation of its full potential by replacing the sessions of the Open University. This development gave me a new sense of self-confidence. I found myself infused with decisiveness to lead the programme. This was in contrast to my initial lack of confidence, which was expressed in my need to share the leadership role with my colleagues in the Open University.

In this new situation, I wanted to explore the meaning and validity of this feeling. My concern was whether the teachers' expressions of trust and willingness to cooperate were signs of dependency (as would be expected in most group experiences), or signs of growth, equality and partnership on their part. As a mentor who came from outside the school, I felt myself privileged to receive the teachers' openness and willingness to share their difficulties with me. Quite a few expressed that they felt that I had something valuable to give them:

> You are different…you are not like other [mentors] who demand that
> we sit quietly and accept everything that they have to say…you speak
> to us as an equal...you respect what we've got to say (Personal Journal,
> January 2, 2002)

When compared with school staffs that relate to external experts as 'foreigners disassociated from the reality of the school' (Arieli and Shachor, 2003), their openness showed me that they had developed a significant measure of trust in me. Thus it seemed that their reaction was not necessarily because they projected responsibility for their learning onto me, but rather because they related to me as a partner, as an equal.

Another way by which to interpret the teachers' reactions at this stage was to view them as the first signs that they were becoming active learners, attempting to direct

the programme in terms of their own felt needs. I sensed this first movement toward independence as an opportunity that should not be missed. I decided then that it was the right time to encourage their full participation in the planning of the programme, rather than just suggesting its direction.

Analysis of this positive feedback turned my attention toward inquiring about the impact of the management tools on teachers' learning. Their use for analysis of the instructional programmes, in addition to the process of written reflections (Chapter 3) seemed to foster teacher engagement in the learning cycle.

This involvement seemed to reinforce the development of the partnership between teachers and mentor. It emphasised the importance of the reflective discourse that took place and contributed to the formation of the research methodology at later stages. The following are excerpts from the teacher's written reflections (January 2002) relating to the impact of the various tools:

- Without planning work involving the integration of the entire staff there is no success. [It is necessary] to have a comprehensive and systemic perspective regarding the programmes.
- It is important to plan them [lessons] and to think about a vision and not just to perform…
- Thinking about a vision reinforces performance…
- I am interested in as many tools as possible that contribute to a dialogue with the pupils.

This dialectic between theoretical and methodological aspects revealed a significant axis through which the mentoring programme developed from this stage. It led to the second turning point.

4.2.4   Second turning point

The Proactive approach – enlisting my philosophy

At this juncture, I had to choose between two directions for the continuation of the course. The first was to continue according to the original plan that had been determined together with the Open University. This alternative was based on the assumption that subsequent lectures would probably offer strategies that the teachers might find more relevant. However, this choice embodied the risk that the teachers might lose interest and faith in the mentoring programme, as they had already expressed their lack of interest in this format.

The second option was to transform the existing action programme, exposing the teachers to a new teaching strategy. It was to be a comprehensive school action programme relating to methodical teaching which would be based on the work of Ben Menachem (2001). I had been exposed to its general intent approximately four months before I entered the school in a short course for mentors. I was prepared to integrate this strategy with one that I had used previously (Margolin, 1998) relating to the development of skills in the field of scientific thinking. This direction involved a risk too, since it was still untested. The risk would put my professional credibility to the test. It reminded me of the concerns shared with me by an experienced teacher on the staff:

> Dina: It is still difficult for me: how should I begin this in class. I'm the sort of person who does not begin any task in the class until I am familiar with all the material; I have to have control over the situation and the material. (Written Reflections, January, 2002)

The choice that I made in regard to this dilemma reflected a proactive approach, which I retrospectively identified in later reading (Covey, 1989). The main significance of this proactive approach is self-determination and the power to decide on an appropriate response, which is expressed in turning threats into opportunities, i.e., the teachers' objections to major parts of the programme were used as an opportunity for encouraging their involvement by letting them lead its

development. This orientation demonstrated my commitment to the empowering potential embedded in the collaboration of teachers and mentor toward achieving pedagogical goals. The change from reactivity and dependence towards proactivity by taking responsibility for our own actions is considered by Covey (1989) and Senge (1990) as a central feature of professional growth. Acting proactively also empowered me in the long run, as it helped me cope with the different dilemmas and conflicts on the road leading to change. Covey (1989) relates to the taking of initiative as recognising our responsibility to make things happen, which is accompanied by careful consideration. It depends on the strength of imagination and connects with the second in Covey's list of seven 'habits' that focus our attention on effectively reaching our goals – 'begin with the end in mind' (*ibid*. 97).

Foreseeing the potential embodied in this new strategy for teaching led to the transformation of the original programme. The subsequent programme combined social and cultural aspects of learning with the individual's cognitive and emotional ones, gearing the learning process to a new level of development. It offered teachers a new strategy of nurturing skilled learners that was compatible with a vision shared by the whole staff. It enlisted the teachers' enthusiasm to collaborate towards its fulfilment.

This unexpected change was derived from my determination at this stage to transform the sequence of the programme and to risk challenging teachers with a unique pedagogy. I had identified the new strategy's potential for responding to the teachers' expressed wish to work with pupils who would take more responsibility for their learning. The teachers' comments reflected expectations that their pupils would come to them already equipped with appropriate learning/thinking skills:

> Tamar: Pupils don't prepare their homework. They don't have any study habits. Learning skills, how to learn, is missing. (Field Notes, 2001)

The teachers' lack of awareness regarding their role in fostering these skills, or how to lead the pupil to this position, was obvious:

> There are few [who are skilled]. I want to reach a situation where they
> will be skilled. I don't know where to begin…I want to create a new
> beginning. (Teacher's written reflection, October 2001)

Consequently, the new teaching strategy that was introduced (see Appendix 5) was developed to equip the teachers with the knowledge they needed. As they phrased it – 'How do I foster skilled learners?'

This question was inspired by the new programme which combined a dialogical assessment model from my previous research (Margolin, 1998) and a method for 'Skills Processing' (Ben-Menachem, 2001), offering a discourse strategy between learners and teachers. This teaching strategy articulated a systematic approach to teaching thinking skills. It was constructed in stages in consideration of learning, thinking and assessment processes. Alongside this structured framework, the developed mentoring model offered a collaborative environment (Figure 4.2). The creation of such a multifaceted learning environment, which I will describe further on, was channelled toward challenging what Fullan (1993) portrays as:

> The hardest core to crack...the learning core – changes in instructional
> practices and the culture of teaching toward greater collaborative
> relationships among students, teachers and other potential partners
> (Fullan, 1993, p 49).

Widening the scope of my theoretical approach

Although teachers were provided with opportunities for constructing meaning through learning experiences, followed by reflective individual/group discourse, their involvement in choosing the direction of the course did not manifest itself in a shared vision. It did not develop as a collective activity, one that called for collaboration by the school's staff to affect its realisation. One reason for this is that strategies were offered in the initial programme and teams or individuals were free to choose those that best fit their needs. Thus, collaboration of the whole school staff was not essential. Fullan (1993, p. 11) forcefully argues that when

meaningful change remains at the 'one-to-one and classroom level, it cannot be done.' Thus developing a collective learning activity was the missing link in the teachers' learning environment. The need to fill this gap led to the first steps towards the formation of my socio-cultural approach in this thesis (though I was only aware of it through later stages of my dialectic with socio-cultural theories, and with Vygotsky's work in particular).

4.2.5 The development of the Mentoring Model (MM)

The MM (Figure 4.2) was developed in order to support the teachers' learning processes. Socio-cultural parameters were incorporated in the rationale and design of its programme (see Chapter 3). These parameters provided the MM with a structured path for productive professional development, which became clearer through subsequent stages of the research. These characteristics of the MM are assumed to motivate teachers to innovate pedagogically in order to enhance their pupils' thinking skills, as will be described in the following sub-sections.

4.2.5.1 Orientation toward social aspects of teacher learning

Efforts to allocate time resources within the school schedule for the purpose of mentoring the staff relied on the teachers' felt need for joint learning within the school activity. The mentoring model met these needs through the activity structure, which provides time for teachers to reflect through staff, forum or individual sessions.

The following are some of the written reflections, which expressed the teachers' needs for collaborative learning:

- Work within a staff is something that contributes to me and I also acquire a learning experience.
- I learnt that I seriously miss out on staff work
- I didn't learn anything new but the meeting with others from other professional staffs was important.

Others forcefully expressed their disappointment, sometimes anger, when collaboration was partial:

- What bothered me was 'Where were the other staffs? Why wasn't everybody participating?!'

Consequently, the rationale of the MM meets this need for a community of learners in order to tap into the teachers' personal commitment to improve their practice (Senge, 1990). At the same time, it enables productive interactions between the social, cognitive and emotional aspects of learning in the programme. Because the emotional aspect in the learning environment is taken into consideration, defensiveness on the part of the teachers was made less likely.
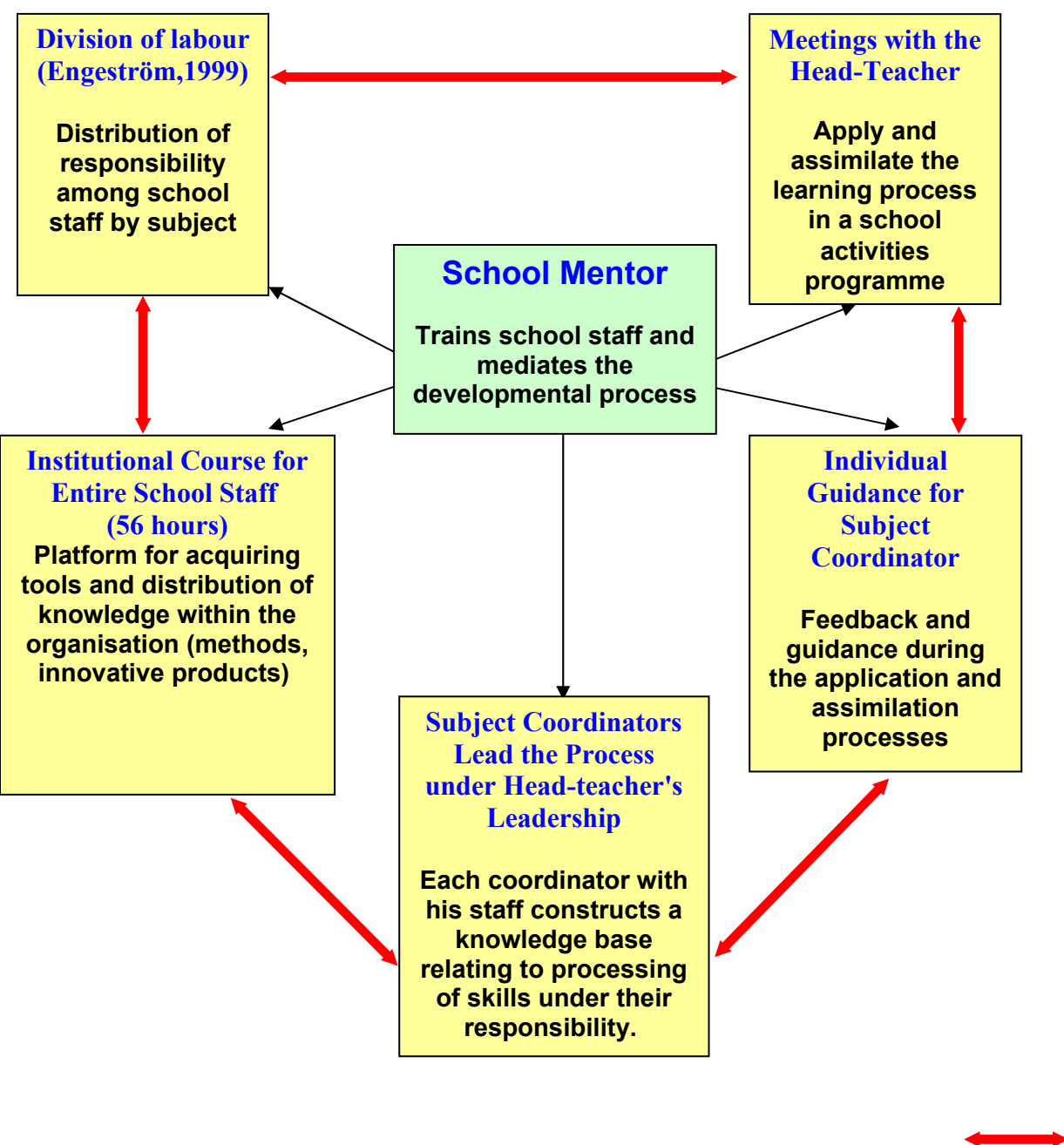
Division of labour (Engeström,1999)		Meetings with the Head-Teacher
Distribution of responsibility among school staff by subject		**Apply and assimilate the learning process in a school activities programme**

School Mentor

Trains school staff and mediates the developmental process

Institutional Course for Entire School Staff (56 hours)
Platform for acquiring tools and distribution of knowledge within the organisation (methods, innovative products)

Individual Guidance for Subject Coordinator

Feedback and guidance during the application and assimilation processes

Subject Coordinators Lead the Process under Head-teacher's Leadership

Each coordinator with his staff constructs a knowledge base relating to processing of skills under their responsibility.

Figure 4.2   School Mentoring Model for promoting a pedagogy of thinking/learning skills

4.2.5.2 Orientation toward the emotional aspects of teacher learning

The following aspects provided teachers with emotional mediation through their learning activity:

a. Support and Encouragement

The mentoring model organised the learning environment in different ways in order to support the teachers' learning processes. Management was obligated to participate and arrange the necessary support and encouragement while teachers were coping with change processes. Management set timetables that enabled the teachers' continuous learning, a difficult task considering the school's dynamic schedule, which also indicated to the staff that school leadership was committed to supporting their efforts.

b. Empathy, Respect and Trust

By relating to the teachers' personal interests and the difficulties they encountered in their workplace, I could express empathy with them throughout our learning conversations. By valuing their knowledge (e.g. intuitive knowledge) and perceptions, I allowed the teachers to consider themselves as equals, while also relating to their personal learning needs. The findings testify to the teachers' sense of confidence, trust and satisfaction regarding the learning processes. In one of the teachers' reflections, I was surprised to find how humiliated teachers can sometimes feel in relation to previous supervised experience.

> I gained my self-respect. You value my opinion…It's necessary to know how to listen to each other even though we do not agree with each other (teacher's written reflection, February 2003).

The above reflected my belief in the need to create conditions for a supportive learning environment that are required for 'the process of knowledge creation' (Fullan, 1999, p 16).

Moreover, the teachers' satisfaction and their commitment to collaborate in the learning process were expressed through their constant presence and participation in the mentoring programme. As stated by the Head-teacher: 'The best proof [is that] it is relevant and highly meaningful to them…otherwise you would have not seen much of them regularly' (February 2003, Field Notes)

4.2.5.3 Orientation toward the cultural aspects of teacher learning

The programme combined a variety of mediating tools used by the teachers. The reflective discourse that accompanied the learning process related to the construction and implementation of the different tools within the teaching strategy (rubrics, modules for skills teaching). These generated the first buds of constructivist pedagogy.

These tools provided channels of communication that supported the exposure of knowledge and the transmission of information. They helped reveal the teachers' tacit, intuitive knowledge from which explicit pedagogy developed and merged within the school curriculum. In addition, formulating and refining the school vision was embedded within these processes, since "Working on vision means examining and re-examining, and making explicit to ourselves why we came into teaching." (Fullan, 1993, p. 13)

The following examples (from the teachers' written reflections, May 2002) indicate the importance the teachers attributed to characteristics of a 'learning organisation' (Senge, 1990) in their school and served as a vehicle for refining their shared vision:

- Thinking about a vision strengthens the action
- It's important to plan and to think about the vision, and not just about how to realise it.

- I enjoyed the fact that it (the joint work} was all pre-planned and it was good that it was accepted by the staff.
- Without planning work and involving the whole staff there is no success. A comprehensive and systemic view of the plans [is essential].
- I wonder how 'to water' the tree [nurture pupils' skills] not only in my field but in light of the disciplines of other teachers.

Following I will describe the rubric tool as it emerged during this study in all its multidimensionality. I will use data analysis to illustrate its generative role, which explains why it became a central leveraging instrument in the mentoring model.

The mediation role played by construction of the skills' rubric

The teachers' experience during the construction of the skills rubric was initially intended to mediate the development of their pupils as skilled learners. Articulating assessment criteria to define the desired mastery level for each skill (see example, Table 4.1) was shown to be a generating act. It triggered change at the levels of teaching, assessment and innovation in the instruction of thinking and learning skills.
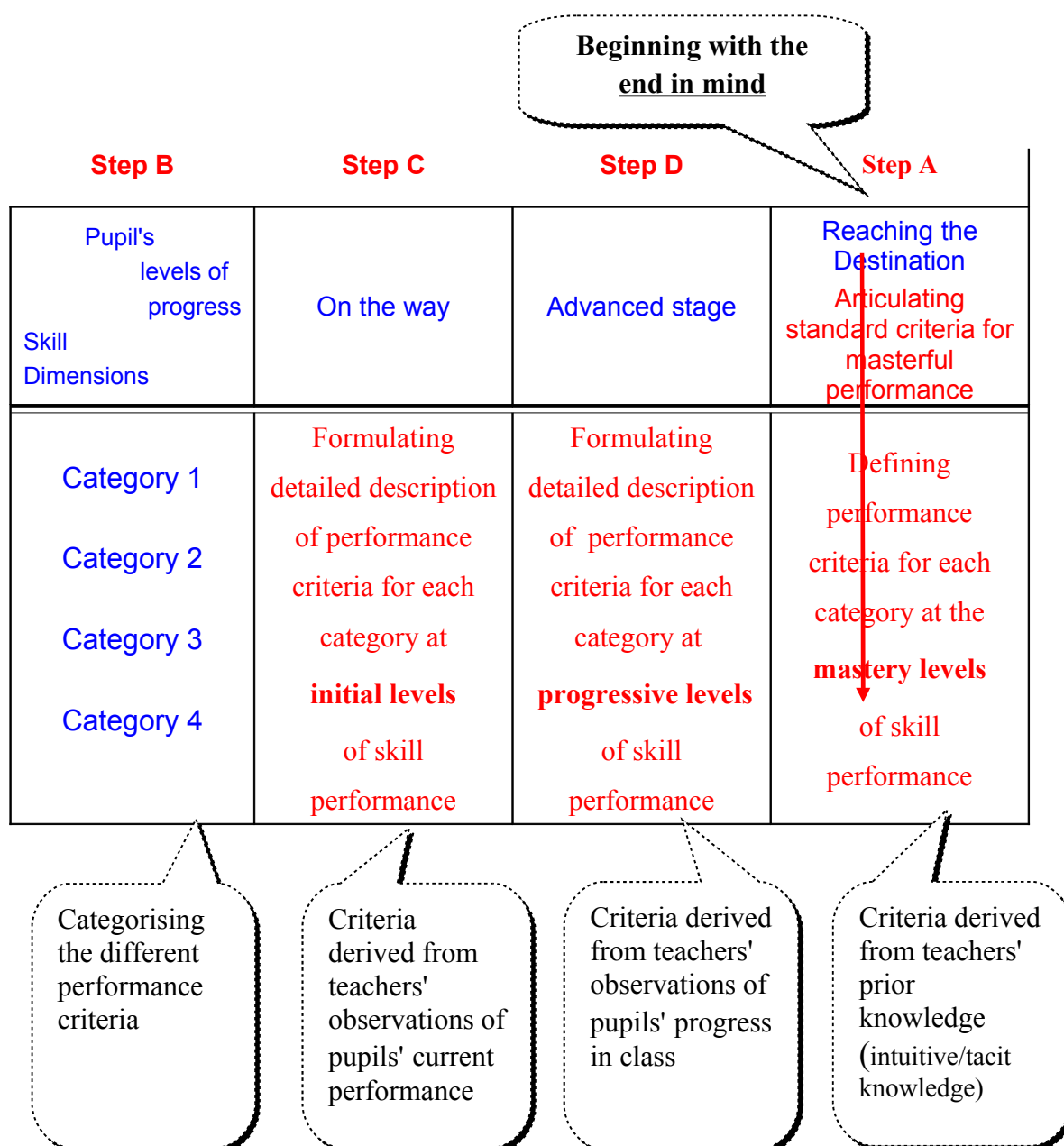
Table 4.1   Example of a rubric developed by the English language staff for paragraph reading skills

Levels of progress Dimension	The Path Begins	Advancing	Reaching the Destination
Opening sentence	Does not identify the opening sentence. Does not distinguish the opening sentence from the main idea.	Identifies the opening sentence in relation to the main idea.	Knows how to identify the key sentence in relation to the main idea.
Main idea	Does not distinguish the main idea from the other sentences.	Does not distinguish between the main idea and the opening sentence. Knows how to distinguish the main concept from the other sentences	Knows how to identify the main idea according to the inclusive content of the key sentence. When there is no key sentence composes an inclusive sentence. When in doubt, examines the meaning of the paragraph without the chosen key sentence.
Supporting Sentences	Does not identify sentences as supporting sentences.	Identifies supporting sentences but does not distinguish the different types (explanation, example, detail).	Identifies supporting sentences and distinguishes the different types. Examines their affinity with the main idea.
Logical Sequence	Does not discern a logical sequence in the paragraph. Does not use conjunctions to determine the sequence.	Partially identifies the logical sequence in the paragraph and the function of conjunctions.	Knows how to identify the correct structure of a paragraph. Understands the function of conjunctions well.

Throughout the mentoring process, opportunities for negotiating meanings aimed at directing teachers to connect with their prior knowledge in order to: "think about how the pupil, the 'teacher's pet' who pleases us greatly with his work method, as he performs the skill to our satisfaction." (Tiki, January, 2002) This stage was found to be significant for engaging teachers in meaningful learning. It helped uncover their intuitive knowledge and perceptions regarding thinking/learning skills.

Table 4.2:   Steps in the construction of skills rubrics
(Blue signifies features of the rubrics, while red signifies steps in construction of the rubric by the teachers)

Step B	Step C	Step D	Step A
Pupil's levels of progress — Skill Dimensions	On the way	Advanced stage	Reaching the Destination — Articulating standard criteria for masterful performance
Category 1 — Category 2 — Category 3 — Category 4	Formulating detailed description of performance criteria for each category at **initial levels** of skill performance	Formulating detailed description of performance criteria for each category at **progressive levels** of skill performance	Defining performance criteria for each category at the **mastery levels** of skill performance

Beginning with the end in mind

Categorising the different performance criteria

Criteria derived from teachers' observations of pupils' current performance

Criteria derived from teachers' observations of pupils' progress in class

Criteria derived from teachers' prior knowledge (intuitive/tacit knowledge)

146

At the first stage (Step A in Table 4.2), teachers were asked to formulate descriptions of behaviours that they expected from a pupil at the best possible level of skill performance. As can be seen in the rubric, the first stage of construction is directly related to the pupils' mastery of the skill ('Reaching the Destination'). Thus, when teachers were asked to delineate their ultimate goals, this was consonant with Covey's previously mentioned notion (1989, p. 97), that in order to reach our goals we aught to 'Begin with the end in mind'. The rubric thus provided an external representation through which to visualise the pupils' progress and the final destination of the learning process. Through it a draft document agreed upon by the teaching staff was prepared, indicating the school assessment criteria for the mastery level of the skill.

In this context, a common finding, reflected in the teachers' discussions, was the debate among them regarding the standard of performance required from the pupils.

The teachers concentrated mainly on the end products of skills performance rather than the thinking acts accompanying the process that yielded them. The following are examples of criteria suggested during the early stage of rubric construction (e.g. a rubric relating to a model for writing paragraphs, Table 4.1):

- The pupil writes an appropriate answer…as far as the content.
- There is a foundation for the answer, reasons.

And some spoke in more detail:

- There is a structure of an opening, a body, a completion.

It became clear to me at this stage that it would be necessary to increase the amount of guidance that I provided the teachers so that they would reflect on their existing knowledge and would describe the thinking and actions necessary for performance of the task. In addition, for most teachers, skills were the product of the pupils' continual practise – the very fact of experiencing the performance of skills,

according to the stages in the textbook, constituted a guarantee for progress and mastery of skills. To the extent that the pupils did not progress, the teachers concluded that:

- They don't work enough.
- If they do their homework and invest they will progress.

Others expressed perceptions which assumed that abilities are innate. Accordingly, exercising can help, but there was not much hope for the weaker pupils:

- They are not capable, they simply don't have the ability.
- You don't know with what [intellectual] level we have to cope.
- To write...either you have it or you don't.

4.2.5.4 Orientation towards cognitive aspects of teacher development – connecting with the teachers' intuitive knowledge

Mentoring was helpful for the teachers at this stage, since they could connect with their prior, intuitive knowledge through the construction of the rubrics and could articulate what they already understood and perceived (Bruner, 1960). This result is compatible with Ausubel's statement (1968, p. vi) that: "The most important single factor influencing learning is what the learner already knows." The *conceptual change model* (Posner et al, 1982) relates to this in a similar manner. I had previously used this model in my work with pupils in the field of science, and used it again in the present research as a tool to coach teachers towards the use of constructivist strategies in their instruction; first by assisting them in connecting with their own prior knowledge, followed by opportunities to reflect on their thinking and cope with conceptual conflicts when exposed to new knowledge and approaches.

Consequently, most of the teachers (19 teachers) in their written reflections (April-December 2002) expressed dissatisfaction with the way they taught and with the undefined standards in school. The followings examples express these thoughts:

- Through the workshop I saw that I was teaching in a completely different manner.
- I would be interested in constructing rubrics and learning programmes for skills teaching.
- The [mentoring] session sharpened my awareness of the need to determine uniform criteria among the staff of teachers of each discipline.

In other cases, the connection with prior knowledge helped teachers identify a gap in their existing knowledge. They valued the new learned strategies. The following are examples of written/audio reflections (Emphasis added):

- I have learnt **how to assess** the pupils' work, and this will also help me in examining the use of new criteria that I have not previously used.
- **It is important to talk in the same language**…it's important that the **pupils know exactly what they are assessed** for and transform this into a work tool.
- I learnt how **to have a specific focus on the definition of skills**, regarding writing according to the paragraph model.
- It sharpened the problems for me in the field of reading comprehension.

There were others who noticed that they had acted correctly when acting intuitively and were encouraged by their new awareness to continually expand their knowledge beyond the intuitive level (Emphasis added):

- In order to prepare a learning programme for skills – **you have to learn**!!
- I received a **clearer framework** for planning a learning programme. It contributed to me; all in all, **I'm in the right direction**.
- It's exciting to find out that **I do so many things intuitively in the right way**.
- I received more **confidence in my work** regarding the paragraph [writing skills]. I think it is important to help the pupil to progress and I look for more and more ways to do this.

- I did it all but not in this order. **I did it intuitively…now it is more organised in my mind.**

This developed awareness is compatible with the broadening of teacher perceptions (Vygotsky, 1962; 1978) concerning the mediation of thinking skills. In most of the teachers' reflections (89% of oral and written), images were used that indicated a new clearer perception of skills teaching following the construction of the rubric. These are a few examples (Written reflections, April 2002- July 2003, emphasis added):

- It sharpened my awareness.
- It sharpened the problems for me…
- It helped me...to focus my thinking.
- …it clarified things for me.
- I do all these things, but now it's different…it provided me with 'projectors'.

Metaphorically, it was as though they had previously walked in the dark, interacting with vague contours of this reality. They were now motivated with enthusiasm to invest in promoting more effective action:

- The whole subject of skills **was fascinating** and important. **I'm interested** in knowing more about the integration of skills in instructional planning. **It was wonderful**!
- It gave me **structure,** [the criteria for] the research question. It sharpened things for me more, [it is necessary] 'To put an emphasis on skills.'
- I cannot believe that I actually expected them to write a complete composition. We should…first thing…begin next year with the structure of a sentence and then the paragraph model...). Clara, 2002.

In comparison with the latter, there were those who objected to the pre-reading strategy and argued:

- I [as a pupil] needed to read the whole article well first of all and even twice and only after that when I understood, I turned to the questions. So what is the exact story here? That the pupils should get the idea that it's unnecessary to read in-depth and that it's

> possible to easily understand the text without reading it? Actually we are teaching them to skip it superficially… (accompanied by an angry tone).

And another teacher:

- All these methods and strategies only weaken the pupils. They don't learn to cope by themselves. I wasn't taught how to do all these shortcuts, I struggled by myself and you can see that I succeeded.

At a later stage though, there were teachers who internalised the contribution of the strategy:

- When I think that …if my teachers had been teaching this way, perhaps I could …even have reached far further in my thinking development.

This developed awareness stemmed from the reflective discourse that accompanied the construction of the rubric during the staff meeting, or at the time when the reflection was written at the end of the activity.

4.2.6   Deriving categories for subsequent cycles

Analysis of the first cycle revealed the significant contribution that the mentoring model had on the development of the teachers' knowledge in the area of mediating thinking/learning skills, which in turn affected growing signs of their empowerment. In spite of this progress, I found the results inadequate. Management as well as most of the co-ordinators (6 of 8 teachers) shared this conclusion. There was a sense of difficulty, such as: how to elevate the teachers' development from their initial recognition of the new strategy and its methodology to its internalisation and systematic use? The need to widen the teachers' perceptions of learning and developmental processes set the target of the subsequent research cycles.

Three components drawn from discourse analysis of this first cycle focused my attention on defining the system for the subsequent research. These were the **teacher,** the **organisation** and the **mentor.**

Secondary analysis led to the derivation of the main categories for assessing the impact of the mentoring model on the teachers' empowerment in the subsequent second and third research cycles:

- **<u>Teachers' knowledge of teaching/mediating thinking skills</u>**, which includes the following <u>sub-categories</u>: intuitive knowledge, metacognitive knowledge, self-regulation (metacognitive skills).

- **<u>Mediating the teachers' learning processes</u>**, which included the following <u>sub-categories</u>: mediated learning, experiential learning, conceptualisation (where reflective discourse and the rubric were central mediating tools in the mentoring model).

- **<u>The learning organisation</u>** including Senge's (1990) five disciplines (see Sub-section 2.4.1) as sub-categories, forming a framework for a socio-cultural learning environment that was assumed to foster self-regulated learners.

- **<u>Empowerment:</u>** Teacher empowerment at this stage of the research was related to: a) the development of proactivity in classroom implementation; b) teacher awareness of the academic tasks' requirements and its mediation to the pupil and c) their sense of satisfaction with their productive impact on pupil learning.

These categories were constantly redefined throughout the next research cycles. The final criteria were derived from a continuous dialectic between the findings and the relevant literature, incorporating the theoretical perspectives of the research on metacognitive development and their relation to teacher empowerment (see Figure 2.1).

4.3 Second and Third Cycles

The previous cycle (the pilot study) revealed the first buds of teacher empowerment resulting from their heightened awareness of the mediated learning processes that were involved in the instruction of thinking skills. A number of new questions arose from these findings as we were attempting to further advance the teachers' empowerment while simultaneously exploring the impact of the MM on such empowerment through the teachers' metacognitive growth.

The central question was: What impact does the mentoring model have on teacher empowerment? This led to several sub-questions:

   a. What impact does the mentoring model have on the development of the teachers' *metacognitive knowledge of* mediating the learning of thinking skills?

   b. What impact does the mentoring model have on the development of the teachers' *metacognitive skills when* mediating the learning of thinking skills?

   c. What impact does the mentoring model have on the teacher's *satisfaction and sense of efficacy*?

Two further questions arose as a result of the secondary and tertiary analysis of the findings:

   a.   What impact does the mentoring model have on the empowerment of the *organisation*?

   b.   What impact does the mentoring model have on the empowerment of the *mentor*?

The mentoring model engaged school teachers in a collective activity system which relates to the following system components (subjects in the collective activity): teachers, organisation and mentor. These constituted parts in the unit of analysis (Fig 3.4). The impact of the mentoring model will therefore be presented below through these three components. The findings relate to the interaction of each one with two major factors of the collective activity: the **mentoring programme** and the **mentoring process**, indicating their impact on developmental processes (objects of the collective activity). Each factor encompassed different elements, drawn from analysis of the discourse identified as engendering learning interactions between the system components. It should be emphasised that separate presentation of the MM's impact on the teachers, organisation and mentors served for analysis purposes. Thus, interacting levels will be presented throughout the following sub-sections. At the same time, the elements through which the interaction between the system components took place acted as both cause and effect – typical features of system dynamics (Senge, 1990). These interactions will be highlighted during the presentation of the findings below in the context in which they took place.

4.3.1 The impact of the mentoring programme on teacher empowerment

Various factors that contributed to the teaching strategy and the mentoring action plan will be introduced in the following sub-sections. The impact of these factors on teacher empowerment and their connection with the teachers' metacognitive development will be demonstrated.

4.3.1.1 The cognitive aspect – the development of teacher metacognitive knowledge

While in the first cycle of the research (the pilot study) the MM triggered the teachers' motivation to learn and initially guided their metacognitive development,

the second and third cycles were aimed at fostering the teachers' metacognitive skills (levels of self-regulation.).

Some teachers who were not intensively involved in the pilot study were satisfied with the production of 'Pamphlet A' (a booklet produced by the end of the pilot study) for the teaching of these skills. For them, it signified a milestone, evidence of their having achieved the learning goal. This explains statements heard in the staff room by some teachers at the beginning of the second research cycle such as:

> What, skills again? … Haven't we finished with this? … We already know this. (Field Notes, September 2, 2003).

In contrast, my view, which was supported strongly by the Head-teacher and by five of the co-ordinators, was that their progress was insufficient. An essential developmental stage that was still needed within the teachers' ZPD was the level of procedural knowledge. This was necessary in order to serve as a launching point towards the achievement of the next level of development – self-regulation in teaching thinking skills (Table 3.2).

The teachers developed awareness of their mediating role in teaching thinking skills through their ongoing experiences and through implementation of the teaching strategy. The subsequent cycles, starting from the initial stages of the research (first cycle), pointed to the development of metacognitive knowledge (declarative and procedural) at two levels: the first, with reference to task performance, and the second with reference to the mediation process of the relevant skills embedded in performing each task:

- **Declarative knowledge** – knowledge of the 'what'.

  1. The tasks and strategies involved in the performance of the tasks and knowledge of self as the performer of the task.

2. The characteristic dimensions of the skill (literacy task): criteria that characterise the standard performance level of the literacy task as derived from the skills rubric as well as knowledge of strategies to be mediated and knowledge of oneself as mediator.

- **Procedural knowledge** - knowledge of the 'how':

1. How to perform the skill embedded in the task.

2. Familiarity with the teaching methods in stages: acquisition of task skills, practice and implementation aimed at the mastery level of the skill.

Lack of this knowledge at this stage of the research was evident among teachers from verbally rich disciplines, though it was surprisingly not absent in the language teachers (Hebrew and English). An ambiguous and undifferentiated perception of literacy skills was found to be a central characteristic of most of the teachers throughout the initial stages of this subsequent research. Orna's reflection on a previous teaching experience highlights this point:

> In the past, we taught a unit and performed tests, and defined them [the pupils] as:' good, weak, mediocre'; and so it was approximate and not focused…I taught parts of the [paragraph] model in order to identify them [the paragraph components] and **did not go deeper into the process, as to how they needed to** [perform] the skill.

At the beginning of the second cycle, findings (through discourse analysis) pointed to the development of declarative knowledge in 70% of the entire assembly (19 out of 27 teachers). The development of procedural knowledge among six co-ordinators (one of the focus groups) was also documented. However, at this stage, only two co-ordinators (Clara and Sigal) expressed prominent development in their self-regulation (level of metacognitive skills) when mediating pupil learning (Figure 4.3 A.).
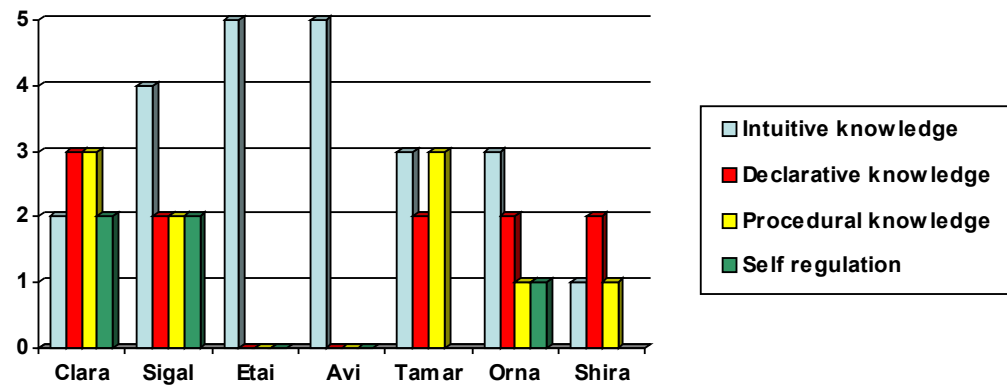
A.   **Beginning of the research's second cycle**
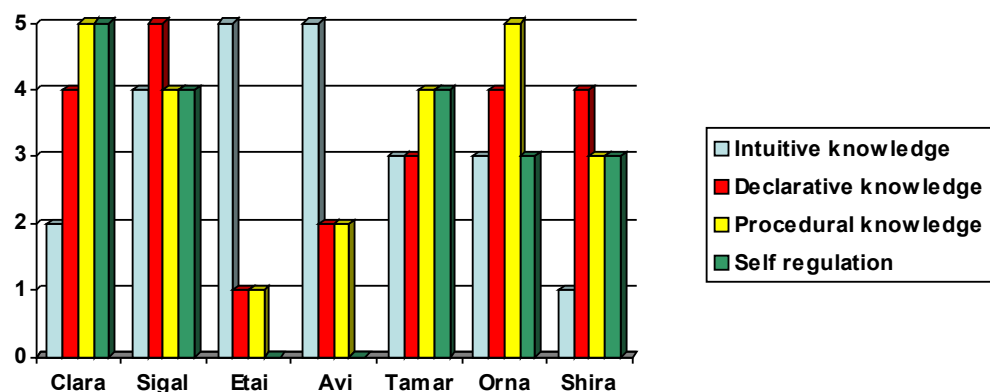
B.   **End of the research's third cycle**

Figure 4.3   Teachers' relative reliance on four strategies for skills mediation (subject co-ordinators**)** – a qualitative scale (from low to high, through five stages) defining the level of reliance on each of four thinking strategies. (See sub-section 3.2.5.2)

Consequently, additional tools were needed within the school activity. The main product sought when achieving these goals was the writing of a school curriculum that focused on trans-disciplinary literacy skills, which combined teaching and assessment strategies for the acquisition of skills. This written programme, put into action at the end of the first cycle together with a reconstruction of teaching tools and strategies (which will be referred to as Pamphlet B), constituted an expansion of the pilot product (Pamphlet A). It included mediating tools for fostering pupil skills at each grade level. The Head-teacher encouraged the construction of 'this product' (December 9, 2003, Personal Journal), and at times pressured me as well as the

teachers to achieve it by the end of the first research cycle (this aspect will be highlighted later in the findings, when discussing the organisation).

The following findings will demonstrate the impact of the tools that were integrated into the action programme, presented through discourse analysis of the teachers' reflective discussions, written reflections, teaching products and the contexts to which they relate. It is assumed that this manner of presentation will shed light on the dynamics that enabled the teachers' development.

70% of the teachers who applied the programme (19 out of 27 teachers) expressed satisfaction with the use of the tools and their explicit, clear structures. The application of the strategy and stages of teaching, which the teachers derived from the skills rubric they had constructed, provided them with a clear routine by which to structure their mediation plans (see Appendix 5).

Co-ordinators were enriched by a very interesting transformation of the subject matter for which they were responsible:

> …teaching is imbued with higher motivation, arousing more curiosity. And we already want to know what the next step will be. (Sigal, September 29, 2003)

Integrating the different tools into the strategy, along with the acquisition of skills for promoting pupil's thinking skills, seemed to be a more promising path for the teachers. The following are various examples of teachers' comments on the impact of the strategy:

> Now I work in a systematic manner.

> There is no need to be alarmed by articles or a lot of [reading] material. Certain techniques help to understand and to derive the necessary information.

> It gives me tools for the comprehension and processing of texts.

> (Written Reflections, December, 2003)

87% of the teachers' feedback (through interviews, observations and written reflections) emphasised the significant impact that the strategy had on the development of their perspectives and knowledge in relation to the skills involved in learning tasks. For example, in relation to reading academic texts:

> The strategy contributes to a different consideration of the written text; looking at the written text from different angles. **Distinguishing between what is important and what is not**.
>
> [This strategy] **organises my thoughts** when I am reading a text.
>
> (Teachers' emphasis, December 2003)

As mentioned earlier, the development of the teachers' metacognitive knowledge in mediating skills refers to knowledge about levels of higher-order thinking skills that are required in performing learning tasks: the strategies (tools) to be mediated to the student, and the teacher's self-awareness as to his/her knowledge of the task and its embedded skills. Explicit naming of concepts, which relate to the task with its different components, characterised the teachers' discourse in the early stages of cognitive knowledge development. Manifestations of declarative and procedural knowledge were frequent during the first stages of the second cycle (Figure 4.3 A) among most of the co-ordinators and some of the teachers in their staffs (those who were individually mentored throughout the implementation of skills, 6 out of 8 co-ordinators in particular).

Levels of the 'what' in skill performance were expressed through assigning names to skill dimensions and their performance criteria. Procedural knowledge was expressed through the level of the 'how', with a refined description of the skill's performance and the thinking processes that are involved. Others expressed awareness of their own knowledge of new ways to perform what they had acquired. The following are examples of the way by which the teachers' declarative and procedural knowledge as performers was manifested. They include features of the tasks and strategies involved in performance, and knowledge of self as performers:

> I learnt **how to find** the key sentence according to the connection between the sentences, and also **how to identify** the essential from the subsidiary [in the text].

I learnt how to write a paragraph according to a certain model by developing the central concept.

(December 2003, teachers' written reflections, emphasis added)

These examples illustrate the first steps that were found essential for the development of mediation skills, namely, the necessary development of the teachers' declarative and procedural knowledge in relation to the performance of specific academic tasks. Teachers who reached this level of development during the ongoing learning experience (and implementation of the strategy) advanced to higher levels of metacognitive knowledge and skills as related to mediating their pupils' progress.

At this stage, other teachers asked to receive additional assistance in using the strategies. Some even required more time for learning with the staff in order to establish their procedural knowledge:

We [the staff] still…have to discuss the way to instil questioning skills. It is still impossible to talk about exercising [in class]... (Tamar, October, 28, 2003)

It became clear that, although most of the co-ordinators were involved in the production of Pamphlet A and had developed levels of declarative and procedural knowledge in a specific task skill, only those who received intensive individual mentoring together with a series of exercises in class showed initial levels of self-regulation at the early stages of this cycle (see analysis of this progress, Appendix 6).

For example, Clara's explanation was based on insights that were developed through reflective processes following intensive implementation of the strategy. The development of the strategy progressed through interaction with the teachers' metacognitive knowledge (declarative and procedural). Her ability to change the initial instructional plan independent of my coaching showed flexibility and indicated her goal orientation and decisiveness. These acts, when accompanied by reflective analysis, revealed the seeds of self-regulation.

The generating role of rubrics as the main cultural tool of the teaching strategy will be demonstrated in the following sub-sections.

4.3.1.2 The cultural aspect – the rubric's contribution toward developing teacher metacognitive knowledge

The findings in this sub-section will focus on the rubric's contribution to the following aspects of teacher learning:

- Development of the teachers' metacognitive *knowledge* in mediating thinking.

- Development of the teachers' metacognitive *skills* in mediating thinking skills.

- Development of an awareness of the impact of the rubric as a mediating tool in instructing, learning, and assessing processes.

- Fostering of dialogue and reciprocal growth between teachers and pupils.

- Guiding pupils toward taking responsibility for their progress in skills performance.

Some of the findings will be presented in the context of implementing the tool. They may provide insight with regard to the dynamics of the teachers' development.

Constructing performance criteria helped advance the teachers' declarative knowledge. Naming of the 'what' and the 'how' in the skills and a growing awareness of what was required of teachers who mediated a skill were guidelines from which to analyse current competencies within each teacher's ZPD. Ronit's growth was interpreted accordingly:

….As a teacher I think [the rubric] focuses you. It arranges things for you…and you know what needs to be checked; just as we did the rubric for the test. You know exactly what needs to be checked. Previously, it had not been in a 1-2-3-4 progression. In fact…you took it apart…it organises better and you do it step by step. For instance, the paragraph; it's about the paragraph components, supportive sentences and finally, writing…I don't call it [just] the structure of a paragraph [makes a gesture with her hands to indicate something general] but actually classification [of the criteria].

Gradually, and particularly towards the end of the third cycle, the development of metacognitive skills at the task level and at the level of gradually mediating the tools to the pupil became evident within the co-ordinators' group. The findings in the following sub-section will focus on this group of co-ordinators and on some teachers in their staff that mirror this progress.

a. The rubric's contribution to developing teacher self-regulation and deepening metacognitive knowledge

The initial findings related to the teachers' metacognitive development as a linear process, where declarative knowledge is considered to be at a lower stage and self-regulation at a more advanced one (Table 3.2). Nevertheless, final analysis revealed that an expansive spiral process takes place at advanced stages of metacognitive development; where metacognitive knowledge and skills evolved side by side, giving momentum to one another at advanced stages of the teachers' metacognitive development (Fig 4.3 B). This dynamic is assumed to point to reciprocal interactions between metacognitive knowledge and metacognitive skill (with regard to the mediation of academic tasks). Moreover, the findings revealed variable patterns of development in which none was linear (except at initial stages of the First Cycle where most teachers progressed from heavy reliance on intuitive knowledge to higher metacognitive levels). An unexpected finding related to co-ordinators who developed self-regulation and yet constantly employed different levels of intuitive thinking/knowledge throughout the various stages of their metacognitive development (Fig 4.3 B). My expectations were that an increase in the teachers' metacognitive knowledge and self-regulation would follow with a

decrease of intuitive thinking when conducting a systematic mediation of thinking skills. This developmental dynamic will be discussed and explained in Chapter 5.

The following examples were selected as representing expressions of different levels of development. They occurred in the context of implementing teaching strategies and the continuous discourse and reconstruction of rubrics (the skill of writing in a paragraph model was chosen as an illustrative example).

Evidence of self-regulation in the mediation of skills was expressed in new assessment tasks that the teachers designed. These included aspects of teacher learning that showed a growing awareness of:

1. The importance of the explicit naming of skill components.
2. Understanding the significant act of directing the pupils' attention to the relevant strategy embedded in the outlined skill.

Clara's reflective observation of the gap between previous knowledge and the knowledge that they developed refers to the tests she and her colleagues had designed in the past.

> We found no [naming of] categories [skills component]…or, there was no connection between the category and the questions. We wrote [the headline of] pre-reading and, when it came to the questions that followed it, we asked questions that were required thorough reading… Here [points at the test] we made a mishmash of skills and called it comprehension questions, which **definitely did not define what skill, and we ourselves did not think about skills but only if [the pupil] understood the text.'** (December 2003, emphasis added).

Though naming skill components served as an indication of the development of metacognitive knowledge, in the context of test construction it indicated the development of knowledge about skill mediation strategies. Clara's next statement illustrates how her knowledge transcended toward evaluation of assessment tasks:

> Look, here, while giving the instructions for the task [in the test], I integrated a requirement [of the pupil] that will give an indication of the course of action every pupil used for the skill of writing the summary sentence in the paragraph.

Sigal, a coordinator who began implementing a module she had developed for mediating the skill, identified a gap at the beginning of the research between her declarative and procedural knowledge in the level of mediating the skill and its use. Her words, presented below, were made at the first co-ordinators' meeting of the second cycle. They shed light on the complex, at times misleading, dynamics of the development of knowledge and skills in mediation. She tried to justify the lack of success in implementation, in contrast with the English staff's success, when she said:

> The English staff has a scheduled hour [time for staff meetings], the teachers do not fulfil the roles of home teachers and do not teach a number of disciplines [as we do …]. (October 28, 2003)

At the same time, she admitted her responsibility for the lack of progress. Alongside her defensive response as to her staff's lack of progress, there is sharing, an exposure of personal difficulties and a taking of responsibility:

> I didn't find time to meet with the other teachers [in the staff]. This is, first of all, my failure. **I still don't feel confident** to pass [the acquired knowledge] on to the teachers. (Emphasis added).

And on two subsequent occasions she shares with the other co-ordinators:

> Only now do I understand that what I had planned then [at the pilot stage] was with less comprehension. I planned the teaching according to the skill components, but in comparison I realised that in class I first begin with getting familiar with all skill components and only then they start step by step and gradually they perform the task.

These expressions were interpreted as the buds of metacognitive skills, a manifestation of self-regulation: her acts of monitoring, her reflection on the progress made, and her reference to the time, effort and assistance needed to accomplish the task. Sigal's frustration regarding the application of the method stems from reflective thinking characterised by self-supervision, assessment and judgment regarding her progress in the task. While most mediating modules that the teachers developed were driven according to the sequence of the skill dimensions in the rubric, she found this approach irrelevant to the comparison skill

in the context of the 7th and 8th grades. Towards the end of the research, where higher levels of self-regulation accompanied her efforts at coping, she identified problems and successfully navigated the processing of the comparison skill.

Analysis through triangulation of documents, interviews and written self-reflection, identified Sigal as a teacher who is empowered to openly share her difficulties and focus on processing the knowledge she lacks – the things that she finds essential for accomplishing her mission as coordinator:

> We are really far from reaching the goal. Only now do I begin to realize that I have not understood the planning, "recipe", "processing", "rubric" for all its components [skill mediation strategies]. I think that this year I will get into this seriously from the start, and the training course must continue… (June 22, 2004).

For Ana (a teacher in Orna's staff), who focused for over a decade on teaching language with all its grammatical emphases, the meaning of language skill was broadened. She demonstrated her growth by applying her insight in other disciplines (February 10, 2004).

> It's not only a matter of language [subject]; in geography too, as just an example, there is a concept – the Great Rift Valley – how do you reach an understanding of the concept? This, too, requires skill. So when you teach language, once you have the [reading] skill, it is much easier to understand any verbally-rich discipline. Even verbal math problems are a matter of language; so we learn that any language skill will assist any learning. It's a fact, they say that he who posses a high language level has a higher intelligence. That's how I see things.

b.   The rubric's impact on summoning learning and assessment interactions in skill mediation

Anna (a teacher in Clara's staff), points to the rubric as summoning a more active role for the learner:

> In my view, [the rubric's] goal is to transfer some responsibility to the pupil. The pupil knows exactly how to assess himself and his pace of progress or non-progress. The pupil also takes part in 'building the

rubric and knows the requirements; he knows the criteria I use to assess him. (February 10, 2004)

Most teachers who built the rubrics found them, in the early stages, tools for the teacher. They were useful for assessing pupil progress and for deriving parameters for instruction. At the same time, analysis of the discourse with the teachers while building the various rubrics raised, in many cases, another facet of the assessment issue. This was the teachers' vagueness and lack of clarity with regard to the criteria or the standards required to perform the skills. Here are the teachers' indications of the role of the rubric in fostering such awareness:

> …It organises the road I walk on, I study the children. Even though the teacher decides his goals in advance [his rules], comes the rubric and it seems to be more specific and organises…my thinking, how I'm going to teach, what I do in every stage. (Ina, April 2004)

Shira reinforces this:

> I, as a teacher, get an **accurate assessment** of the pupil's situation and so I can plan the instruction in accordance with all pupils in my class. Actually, this is a kind of formative evaluation. (Emphasis added)

Orna contrasted this with her previous behaviour:

> **'The overall process is focused, focused on knowledge**…not only the subject matter is transmitted and [I] check if the pupils acquired the skill or not. Now, there is **a thinking process**, **continuity**.' (Emphasis added)

Through the rubric, the teachers' attention turned toward the role of assessment within learning and teaching interactions. With the development of their conceptualisation, the issue of letting the pupils participate in determining the criteria was no longer hidden but became a platform around which a new sharing of teaching, learning and assessing evolved.

Ronit identified the contribution of the tool to the setting of standards required from the pupil, as well as for assessment of his progress:

> The pupils know what you expect of them and you know what to demand…and you also know what to check. It is important with relation to content, from the teacher's point of view, to organise **what you ask them to perform**. The pupils, too, want to know exactly where they stand…here [facing the rubric] they in fact know why they are not doing well (March 2004) (Emphasis added)

Involving pupils in the assessment process through the use of written reflection created a new opportunity for the teachers to dialogue with their pupils. The following is a written reflection presented to me by Sigal, expressing her engagement with a metacognitive and dialogical pedagogy in mediating thinking skills .

> Now, thanks to the comparison [skill], I understand what we are doing in class. Earlier on I was confused, I did not understand who Rashi was [an interpreter of the Bible] and what he has got to do with everything, and now, because of the comparison, I suddenly understand what Rashi says and what is written in the verse and this skill of comparison helps me a lot. It also became quite interesting. (April 2004)

The teachers' metacognitive development nested in this learning environment, as presented in the above example. The strategy that integrated the rubric into a reflective discourse among learners cast a new mould for teacher-pupil sharing during the lesson. Teachers pointed to a change in their pupils' reaction in class: initiating questions and taking responsibility for their learning. The paradigm of a teacher who knows and asks and a pupil who answers and is assessed no longer pertained:

> There were very **beautiful dialogues**. [A pupil]: 'Just a minute Teacher; we said that an opening and an end [in the paragraph structure] are not obligatory, how come?' And then we explained what was advisable. They asked: 'What can be the problem with a logical succession in supporting sentences?' **I noticed that they asked more questions**…**I noticed learning and curiosity; they wanted to know** [excitedly, enthusiastically]…and another pupil answers him that perhaps he wrote supporting sentences but not in a logical order. On their part too…**the whole process was focused**, **knowledge-focused**.' (Orna, June 22, 2004, emphasis added)

c. The rubric's impact on developing teacher mediation skills and sense of self- efficacy

The teachers increased faith in their ability to promote pupils who they had previously identified as 'weak':

> I have acquired tools that teach me **how to explain** the structure of a paragraph to pupils.

> I have acquired ways **to cope** with heterogenic classes regarding tracts of comprehension, and how to instil writing skills while pupils are [progressing in] reading'.

> (Teachers' written reflections, December 2003)

Most of the co-ordinators (6 out of 8) expressed the growing sense of confidence that they gained from this development:

> Clara: It helped me learn and now I feel that I have more tools.

> Orna: The tools help me as well as the pupil. I used to have tools but they need to be usable; the tools I had in the past – I could not use.

d. Increasing teacher trust in their pupils' capacity to develop

Rubrics and their components constituted a principal tool for developing teacher mediation skills. They helped the teachers navigate the teaching and assessing processes (through planning teaching stages and configuring categories for test mapping) and contributed to an increased feeling of control over their craft and satisfaction in teaching and fostering their pupils' skills. The following example relates to Clara's progress, where increased levels of self-regulation contributed to her satisfaction:

> Clara: **Weak pupils are also making a progress**. We've learned to write a paragraph. I can see sentences, content, an opening… (she emphasises every word and a tone of contentment is detected). I mean, they write proper sentences. (Interview, May 25, 2003) (Emphasis added)

This teacher, whose level of implementation transcended that of the original plan (toward implementation at higher grades, 11th-12th), demonstrated creativity in her

performance as a skill mediator. This found expression in the integration of tools in learning projects that were redesigned following her broader awareness of the significance of mediation:

> …I only started with them in 11th grade…they have the writing (on a technical level) but **they don't have the thinking, and their expression in Hebrew is poor**…However [now] **I see more thinking**, more writing; there is a paragraph; because I keep asking to mark [analysis strategy] and now **they do not ask if they should mark any more; they automatically mark** the idea, the opening, the supportive sentences…a whole industry of colours. Yes, (in a satisfied tone) **there is certainly awareness** [in pupils' behaviour]. (Interview, June 8, 2004) (Emphasis added)

And on a different occasion, another example:

> 'With 11th grade pupils, I worked on writing in an argument model. We worked systematically and **the pupils were so excited** from the results of the writing…**they feel as if they have created something that in the past they had thought was so difficult, and here they succeeded, as if by magic**…' (Field Notes, emphasis added)

e. Fostering awareness of pupil cognitive difficulties – learning what's inside a pupil's mind

The teachers' direct involvement with the strategy tools raised their hope in the possibility of fostering their pupils' higher-order thinking functions. This development was in contrast with arguments I constantly heard from teachers when a pupil did not distinguish the essential from the petty … ' the pupil is weak'. (October 2003)

> Shira: Even though the teacher determines goals in advance, the rubric specifies more, is more organising…my thinking, where I'm heading, how I teach my pupils.' (May 11, 2004)

In this sentence Shira expressed how good teaching is intertwined with directing the teachers' attention to their pupils' thinking processes. Others relate how these new insights grew with their experience and the awareness that they developed of the characteristics of background skills:

Ilana: It was interesting to find the main idea in each paragraph. Usually that is what I do in the class with my pupils and **sometimes I don't understand their difficulty in performing the task.** But now, as a pupil, when I had to do it myself **I understood that it is not so simple.**' (March 2004, teacher's emphasis)

On the whole, teachers teach texts with which they are familiar. Over the years they become less sensitive to the level of difficulty that their pupils experience. In contrast, they receive an opportunity to re-experience such difficulty when they themselves experience new and complex texts, where neither the text nor the answer is known in advance.

Other teachers, due to this experience, have become more aware of the stages needed for skills performance, instead of expecting their pupils to elicit the right answer (the main idea is illustrated in the following example):

In the past **I immediately asked them to find what the main idea** of the text was, and I didn't understand why they had difficulty. Now I understand that first it is necessary to understand the text and to analyse it and only then to find and mark the main ideas.' (April 2004, emphasis added).

Teachers began to experience the new generating effect of sharing knowledge with their pupils. The following are a few examples reflecting this mutuality:

'When they ask me I, too, learn if I performed O.K.' (Orna, April 2004)

I learned a lot…going into the guts of the skills. One thing I learned is to better define who is a pupil that doesn't understand…[and] to use pupils answers to build my rubric…It helped me to understand what I don't know and what I should do…**I needed to enter the pupils' minds**. (Tamar, June 22, 2004, emphasis added),

4.3.1.3   The emotional aspect of teacher development

a.   Positive feelings

The teachers' metacognitive development was accompanied by expressions of satisfaction and happiness when their efforts were shown to be fruitful:

> I have never reached such a level of writing [with pupils]. **I am very happy**. (Clara, April 2004)

And in the context of another application by the same teacher:

> Now, in 12th grade…I decided to bring the rubric and a pattern for writing a paragraph…We started to work in class and suddenly things started to shape up…**I was in seventh heaven**… [eyes glowing with excitement]; they conducted a fantastic discussion amongst themselves about what they had written, and then, following the whole discussion [and] the comments, I asked them to finish the task at home. (Emphasis added)

b.   Teacher awareness of emotions that accompany pupil learning

Teachers expressed increased awareness and sensitivity of their pupils' feelings of satisfaction, happiness and pride that accompanied their development.

> With 11th grade…the **pupils were so excited** with their writing products… (Clara, February 2004) (Emphasis added)

The followings expressions indicated the teachers' growing awareness of the significant role of emotions in mediating skills derived from their own experience through this study:

> I now understand better what the pupils undergo.

> As a teacher, **I appreciate the pupils' work more and more** and **understand them** better, **and their way of thinking**; and I learn a lot from this. For example, that I mustn't force or pressure pupils to do something that they do not want to do. (November 2003, teacher's emphasis, written reflection)

> …to be more patient, more considerate of the pupils' feelings.

Another teacher, who noticed that achieving tasks under time pressure disturbed her, was able to transfer the implications of her experience to that of her pupils:

> [My] difficulty in arranging the sentences and the discussion that took place caused me to think of my pupils and the situation they will be in when they have such a task…especially when the work is timed…**the embarrassment** that the last ones will feel when they managed to performing the task. [This experience] arouses the **pupils' emotions** in me (emphasis added), it is difficult for me to sit quietly all the time [during the workshops] as I like to chat and laugh all the time, and here [at school] I am a teacher who strictly requires quietness and concentration and full attention from my pupils. So, now **I have a better understanding of what the pupils go through** (November 2003, teacher's emphasis, written reflection).

4.3.1.4 Impact of the mentoring process on teacher empowerment – features of the mentoring discourse

Discourse interactions in mentoring constituted a generative element in the school's activity. While this aspect of teacher learning was detected in the pilot study, this sub-section seeks to shed light on new meanings gained from the subsequent cycles of this study.

Most teachers in the research (17) pointed out after its completion (in written reflection) that it was important for them to continue their learning in the domain of skills mediation. This seems to reflect the meaningfulness teachers found in the mentoring process. Discourse analysis revealed the following features of the learning process which contributed to this meaningfulness:

- **Reflective discourse –** mediated the process of negotiating meanings, conducted through various lenses that mediate teacher learning: cognitive, emotion, social and cultural.

- **Dialectic relations** between opposing features of the learning process: reactive versus proactive behaviour, intuitive versus metacognitive

thinking, and empowerment versus disempowerment. These were projected on the dynamics of the learner-mediator participant structure throughout the learning cycles.

The findings will be presented through three levels of resolution:

A. Through examination of different episodes in the mentoring context which relate to all participants/collaborators in the research.

B. Through microanalysis of one staff's discourse.

C. Through microanalysis of one coordinator.

This strategy afforded numerous angles from which a full picture of the discourse space could be drawn. It was assumed that this manner of presentation would shed light on the contribution of the mentoring process to teacher empowerment.

a.   Assigning space for teacher reflection

The mentoring session provided the teachers with discourse space where they could find respite from their constant day-to-day activity and derive meaning from their work. This learning space was associated with a time frame, a place and mediating tools. These tools provided the mentoring process with a stage upon which metacognitive learning interactions could be mediated.

One aspect of the learning process that contributed to the enhancement of reflective thinking through the mentor-teacher discourse relates to the concept of 'wait time' (Rowe, 1987). This concept, borrowed from constructivist teaching methods, refers to the importance of giving the learner thinking time in order to phrase an answer to a question. It was originally used in teacher-pupil dialogue and was found useful in the teacher-mentor context. The following example shows how a mentoring session enabled the teacher to 'stop and think' about his/hers actions. This resource helped

both teacher and mentor capture the teaching/learning experience. I have chosen to highlight how the mentor's questions led one teacher to reconstruct her experience. The time that was allocated made it possible for the teacher to ponder, think and reconstruct facts. It was approximately two months after a relatively less intensive mentoring process. Here are the first words the teacher said when asked: "What was the role of the rubric in your work?"

> Danna: I think that the rubric…well…**I put less effort into the rubric** and [actually] **did build it**, but **did not give** it to the pupils. Well [pondering]…yes, **I** [actually] **did give one**, about the paragraph, but… well… [ponders again and phrases] I think it focuses you, ah…makes order in your head… (February 3, 2004, emphasis added)

This teacher was less involved than her coordinator in planning and implementing the different skills, apparently due to the limited number of mentoring sessions in which she participated. Her initial statement that "I put less effort into…" seems to reflect her relative lack of involvement (due to timetable difficulties in arranging a common meeting time for all staff members at the school). Nevertheless, she was involved in three private mentoring sessions during the first months of the second cycle, as well as in implementation activities in class. While forming her answer to my question – putting words in order and composing the sentences – she reconstructed the experience and ordered her thoughts, eventually achieving a reflective outlook. This is an example of the manner by which the discourse provided the teachers with an opportunity to 'catch' the learning experience and draw meaning from it before the bell for the next lesson rang. Without this opportunity, Danna's experience would join other forgotten ones, which would be lost to conscious recall.

This thinking space was identified by the teachers as an essential framework that would be available for them to receive support:

> Sigal: We all know too well those very exciting in-service training sessions at the end of which we decide to take action, to bring about a change. But we also know that at the moment we encounter some difficulty, we immediately abandon the idea. But when you Tiki, are here in the school as mentor (not necessarily in person), it is different. (October 28, 2003)

Most teachers' awareness of the importance of reflection in learning/teaching/assessing processes increased with this once-a-week discourse framework. This is in contrast with the initial stages of the research, when reflection was not valued:

> "When you begin asking questions I begin to understand what my pupils sometimes tell me when we talk: 'stop digging'. (June 2003)

Following an assembly workshop, partially devoted to the subject of developing reflective thinking, most teachers still phrased their answers laconically:

> "I will use the taught skills."

Or, in relating to an open-ended questionnaire:

> I enjoyed doing…'the comparison table and thinking map.'
> Something aroused objection in me: "filming".
> (Teachers' written reflections, April 10, 2004)

Most of the teachers ignored the reflective experience. One reaction, which did refer at length to the reflective aspect of the learning process, showed an attitude that considered it suitable for weak pupils and not an integral tool for learning, teaching and assessing processes:

> In fact, I may take it upon myself to try and cope with reflection in those classes with learning problems.

Reflective discourse was called by most of them 'talking', or 'just talks', and was regarded as a waste of time. They put great value on 'doing', performing activities. Sigal, whose involvement and enthusiasm in the learning process was high, expressed this difficulty well. Below, she shares her attitude to the documentation and assessment processes of her pupils' progress:

> We are not good at writing what's happening. We are good at doing [her tone proudly stresses the acting]…I hate it when I need to write [documentation/reflective diaries]. I fully enjoy the lessons with my

> pupils in class…I love working but all this writing gets on my nerves.
> (February 24, 2004)

In contrast, Moshe (the Head-teacher), who usually demonstrated commitment to performance and focused on achieving 'products', expressed awareness in a concluding interview of the importance of developing the teachers' reflective abilities. After going over the teachers' written reflections, he said:

> I think that what you did at the end of the meeting was meaningful… the reflection. I checked, [and only] twenty five percent are capable of coping with feedback [sounds disappointed]. Most of them do not hand in a page; they write a word and skip ahead. They did not receive tools, and therefore the tool you provided is necessary…for the teachers to internalize and pass on to the pupils. This is a tool to be used more, or, they will not be able to derive conclusions about the process and personal conclusions.(February 24, 2004)

Despite these difficulties, progress in these thinking patterns was identified among teachers who experienced more mentoring sessions. This will be presented below, as it was integrated into the various features of the discourse.

b. Emotional aspects of the process

Support, encouragement, mutual respect, confidence and trust in the mentoring process were emphasised by the teachers as significant elements that enabled empowering learning processes. In addition, the **mentor's devotion and enthusiasm** were indicated as catalyst of the mentoring collective discourse. These elements helped them cope successfully with enhancing change in their teaching methods and in their role as skill mediators. I placed these expressions under the title of 'emotional support' because of the sense of confidence and lack of threat they evoked during mentoring. This emotional support encouraged them to dare to take risks during the learning process. Teachers began to share weaknesses that they had previously encountered in their work, as well as difficulties they had during the process.

The following situation illustrates the connection between support and encouragement, on the one hand, and the teachers' willingness to open up and share their earlier lack of knowledge, on the other. During a mentoring session with Clara, while she reflected on a new test that she had designed, I expressed my appreciation and excitement upon noticing that she had implemented new insights in her work. In my words, I stressed my appreciation of her professionalism, characterised by learning processes that are accompanied by monitoring, assessment and constant reorganisation of existing knowledge:

> Tiki: It's amazing how much you learn and implement from one meeting to the next. In my sessions with you, I feel a refilling of energies…all your activity really excites me…and taking it all straight to the class, and then learning again without recoiling…you keep seeking new ways to improve. You have so much motivation.

As a response, Clara immediately pulled out another old test (prepared by the staff) and said:

> Wait, if you are excited by such things then come over and look, there's more… [She pointed at the teachers' lack of knowledge concerning the skills components and their names:] Have a look. These are tests we prepared in the past. I brought them for you to see…We wrote pre-reading and then we asked questions that required intensive reading.

Nevertheless, Sigal's reflection on her learning experience reminds us of the other side of learning – the difficulties and struggle:

> **To be entangled and confused is what one needs in order to learn**.
> You get to see the process while in the peak in this kind of instruction.
> (April 2004, emphasis added)

Sharing the excitement and enthusiasm of learning was found to be a prominent characteristic of the participant structure. It was part and parcel of the learning and empowering processes.

The mentor's involvement and commitment to the learning process provided the teachers with a source of confidence and trust in their ability to cope with change.

Sigal's comment points at these qualities in the mentor: "Your devotion to the concept and to the staff leaves no room for despair."

Teachers started to experience the real excitement of learning. My expressions of enthusiasm in connection with the teachers' development began to be reflected in their behaviour:

> "Come over and put on five kilos… (i.e. come and enjoy the new achievement)," or "Come here, I have something you would like." When I asked: "Are you doing this for my sake?" the answer was: "No, but we know you can get excited by it," or, "Not everyone can understand this.(Personal journal, April, 2004)

The mutual enthusiasm from learning that characterised the mentor-teacher participant structure was replicated in the teacher-pupil context. Orna's reflection on her actions demonstrates this change:

> My enthusiasm rubbed off on them. A weak pupil whom I don't teach [any more] comes to me and reports his marks in grammar. [This was] a pupil we classified as being low-average (in a surprised tone).

Clara's words that "Not everyone caught this bug" indicated disappointment on her part that not all her staff members experienced this pattern of enthusiasm. These expressions marked the closing of a circle for me, which started by identifying a problem in the field of mentoring. I sought to engage the teachers' enthusiasm through learning experiences. I noticed that those who did "catch the bug" indicated that they entered productive learning cycles. Following additional meaningful learning experiences, some of them reached a point where they could mentor and mediate the learning of their pupils and their colleagues as well. (These findings will be presented in Sub-section 4.3.2, dealing with the empowerment of the organisation) In Chapter 5 (Discussion), where I will present evidence from brain studies that validate the significance of enthusiasm as an indicator of meaningful learning processes

Orna's sharing of her lack of knowledge with me should not be taken for granted. She is an experienced teacher with a professional repertoire whose reactions in the

first sessions transmitted the message: "I know." Eventually, trust was built. The findings show that mutual learning during the discourse enabled that development. The following quote indicates that her **confidence** in self-disclosure was based on reciprocal learning between mentor and teacher:

> In the past I used to teach parts of the [paragraph] structure for identification [of the paragraph component] **and I did not go deeper** into the processing…Now I feel **it's easier after what we have done**… We [teachers] worked intuitively[in the past]. Great! We enjoyed it and left without making any progress, with no monitoring…It is **easier to connect to a mentor**. In mentoring, **you too, as a mentor, learn**; things change in you; the shared learning. (May 2004, emphasis added)

Sigal's sense of confidence in the mentor relied on the supportive and assistive aspects of the mentoring, thus fostering teacher growth:

> You help to remove the obstacles and leap forward. Your presence among us leaves no room for 'stagnation' or for 'being stuck', you are close at hand coaxing us to experiment… The fact that **we can rely** on your assistance at any time, **is responsible for those seeds [of creativity.]** (Emphasis added)

When I interviewed Moshe, the Head-teacher, trying to draw insight from the processes we experienced together, he reinforced these aspects of confidence and trust, this time from his personal point of view. An understanding of the teachers' openness to learning is emphasised here in reference to the mentor's professionalism as a knowledgeable and trusted figure.

> Moshe: **Openness** and **absolute trust** are essential…for trust to be built, the mentor must be professional. When the head-teacher identifies professionalism in the mentor, he can tell the mentor anything…Secondly, the personal trust that things do not leak. Discretion. Discretion is highly important.
>
> Tiki: Is trust connected only to discretion?
>
> Moshe: A philosopher said [he tries to recall an appropriate metaphor] …your being able to lay your head on the shoulder [of the mentor] and the head may stay on that shoulder for **support and reinforcement**, the result…trust. (May 30, 2004, emphasis added)

These aspects of the mentor's discretion and the teacher/Head-teacher's ability to place trust in professional support constituted the main bond in the relationship

among the research participants.   Trust was thus a prominent feature of the participant structure.   The mentor was an address for sharing and reflecting on difficulties, both professional and interpersonal within the organisation. Difficulties included the teachers' overt and covert power struggles. This pattern of behaviour was expressed in the creation of trustworthy relations and a sense of confidence in the mentor. Some teachers, while coming to share their difficulties, pointed out: "I am confident you will not talk about this."

I enlisted my proactive approach, to which I will now turn, in order to navigate power struggles within the organisation towards a dynamic that empowered the research partners.

c.   Enlisting a proactive approach in managing conflicts and contradictions

As a mentor, my role in the school's activity was that of someone who collaborated with the teachers in achieving a common goal. The mentor, in this context, is a component in the system (school activity), yet by definition I was not a member of the school staff. Thus, I did not share in all of the personal interactions involved in the workplace. This situation, together with the trust that I acquired, placed me in the role of a conciliator through whom teachers could, as Sigal put it, *ventilate* (blow off steam). At times, the teachers shared conflicts and tensions related to power struggles between various functionaries, sometimes even with powerful people outside the organisation. Notions from the field of conflict resolution (the theory of coercion) and, in particular, Covey's (1989) work were found to be compatible with my own proactive philosophy.   These ideas provided encouragement for me when I presented my collaborators with a flexible approach, directed towards achieving shared goals by applying principles of 'win-win' (*ibid*) and 'fitness for purpose' (Cohen, Manion and Morrison, 2000, p. 270). In this way, tensions and threats within the learning space diminished. It provided teachers with the opportunity to make choices between available opportunities, solutions and suggested alternatives for action. Coping with challenges this way created patterns

of negotiation in the face of the different conflicts and dilemmas (an example is presented in Appendix 7)

Similar occurrences for turning a power struggle into a learning opportunity (Covey, 1989) took place in the discourse with the teachers. I will present them in the context of launching the new Hebrew language curriculum. These events revealed aspects of power sharing rather than 'zero-sum' alternatives (see Sub-section 2.3.1), where each side became empowered. The conflict in this case was between continuing a study programme in teaching skills that was developed by the teachers or abandoning it in order to adopt a new book that was launched in the framework of the new state curriculum.

The teachers were required to learn this new curriculum before implementing it. In the beginning of the research, the teachers belittled themselves when faced with external mentoring. They adopted the new book and taught in most cases according to it. At first, the idea of integrating the programme they had developed with the new one did not even occur to them. The following are some typical reactions to my questions when I tried to examine their progress in implementing teaching modules that they had developed through the pilot study (the paragraph module skill):

> Orna: The new regional mentor said: 'Forget everything you have done until now. (October 7, 2003)

The following dialogue I had with Danna furthers this point: (October 7, 2003)

> Danna: In our meetings with the mentor for the new curriculum we sit and write down everything. We don't talk about the existing (skills) programme.
>
> Tiki: Did you show her the programme for skills developed by your staff? Did you try to explain how you, at school, plan to enhance the pupils in language skills?
>
> Danna: What can I say? This lady knows all about the matriculation, who am I to argue with her?

My role as mentor was to involve the teachers in an intensive examination of the curriculum they had developed. This process led to their realization that their innovations had some superior aspects in comparison with the new top-down instructions that were approved and recommended by the educational establishment. It resulted in an integration of their innovations with selected aspects of the newer text. Responding proactively to the denigration of their autonomy and innovations was thus in contrast with their initial self-effacing reactive response (detailed analysis of this development will be described in the microanalysis).

d. Cultural features of the process

A variety of tools that were integrated into the discourse helped in structuring a goal-orientated process. These tools contributed to delaying teacher reactions and encouraged them to observe learning situations. As a result, the teachers tended to take more time and consider alternatives before reacting to a problem with additional activities, or by concluding that the pupil is simply weak. The following examples highlight expressions that attest to the teachers' growing awareness of mediated reactions, where their previous immediate reactions were replaced by mediated ones.

> Ronit: I, for one, [usually] hand out worksheets. So now I am asking myself what good will it do? Where will they not succeed? What would my pupils find difficult?

> (Participants' observations, emphases added, May-June, 2004)

Tamar demonstrated glimmers of having internalized the importance of the reflective discourse. Her newly developed insight drew her attention to the importance of a delayed reaction:

> I **begin to see certain things**…with Tiki's influence... [Earlier] **I had a tendency to run** forward. Tiki, all the time with her 'verbalizations' and the reflection… [In a humorous tone]

Clara's delayed reaction finds expression in controlled, rational, goal-oriented planning in contrast with her past immediate reactions:

> Today I know where I am going. [Gradually] from something basic… like a point from where you start a line. Earlier directions were given **without thinking** how the pupil would perform, without knowing what the teacher expects of him. We teachers did **not make ourselves clear,** not to ourselves, or the pupils…I used to ask 8th grade pupils to write a composition (in ironic tone). **I don't understand how I thought that they could do** it just because I told them that a composition should have an opening, a body and an end.

4.3.1.5 Mediating teacher learning within the ZPD - a multi-dimensional interactive process

The findings of the discourse analysis identified the contribution of various visual representations (such as rubrics, the learning cycle, and curriculum planning) as psychological tools for mediating teacher progress. An essential mediating tool throughout the reflective discourse was the construction of the skill rubrics. I will first concentrate on its impact.

a. The rubric – mediating self-regulation throughout the mentoring discourse

Based on the teachers' written and oral reflections (19 out of 27), many attributed their individual development to their experience with the different tools. The rubric was demonstrated as a central vehicle in the mentoring process that served in mediating the teachers' metacognitive growth (Table 4.2). Orna ascribed her progress to the on-going negotiations and restructuring involved in building the rubrics. In addition, she also highlighted aspects of the participant structure that were transformed by this tool – from the isolated work of individuals to collaboration and negotiation guided by a shared goal:

> Had I taken the [skills] pamphlet, read it [without being involved in constructing it]…I would not have the **dialogues that were created** [during the discourse] and the **shared thinking**. Grappling with the difficulties when building the rubrics, grappling with the concepts

> when **the goal was to create a meta-language**… I remember the **arguments** [emphasised tone] **about the meaning of concepts**.(June 22, 2004, emphasis added).

Orna's progress illustrates the dual function of the rubric; as a tool for developing knowledge as well as an assessment tool. At this stage, she used the rubric for monitoring and assessing her team's programme in comparison with new aspects (standards) in the new state curriculum. Expressions of self-regulation (such as reflection, initiation, monitoring and feedback on performance) accompanied her proactive behaviour (June 22, 2004, emphasis added):

> Orna: Today, again, when I read the rubric I stopped: Perhaps we should consider reorganisation [of the skill dimension]…
>
> Tiki: With what are you not satisfied?
>
> Orna: The issue of coherence. It doesn't work systematically with the new book [the one based on the state new curriculum]. When we reach the subject of the paragraph we need to instil the skills our way [the team's innovation]. The whole process is missing [in the new book]. They [in the new state curriculum] inserted the references, which is fine with regard to the paragraph. They want to register in writing that [the pupils] write in a higher register. I want to improve [these aspects in the rubric]. **It is beautiful that nothing** [in teaching strategies or approaches] **is sacred**. Today I use more reasoning [judgement].

Orna's last sentence demonstrates her engagement in an ongoing learning process. This level of progress was similar to that of the other co-ordinators. Their learning also transcended to higher levels of implementation in the learning cycle, the creative one:

> Almost in any involvement you discover new things. I am plenty occupied [with the skills] and yet there is a lot more to innovate…in redesigning the rubric in [the component of] identifying characteristics for comparison… (Sigal, interview, June 22, 2004)

And the mentor's accompaniment throughout the mentoring discourse:

> Sigal: You are close at hand, coaxing us to experiment and not to accept ready-made material. To experiment despite the difficulty and the heavy workload that exists anyway (November 11, 2003).

Experiences accompanied by a reflective discourse fostered the teachers' ownership of the change in curriculum (by integrating their innovation into the school curriculum). As Orna emphasised:

> It's important that we do not receive every thing ready-made. When it does not come from above [imposed change] it is easier for us to identify with. The former tools have not served me…Today, after what we experienced, I feel it's easier. The tools assist me and the pupil.

And Sigal acknowledged the contribution of the Kolb model:

> The learning cycles – which were well known to all of us – took on a new significance…I told myself last year: 'What's the problem?' Within three weeks I am transmitting the skill [in class]. But you realize that it is not that simple. Now I see that each dimension [of the comparison skill] is far too complicated. Ready-made instructional materials [such as books] are not enough…(May 30, 2004)

Through the mentoring process, teachers received constant appraisal of their progress that was sensitive to their level of development. I needed to be flexible in order to adjust the mediation process to the level of each teacher. Clara's words expressed appreciation for this gradual support:

> Today I feel more organised as a result of the process. Mentoring is important when it is conducted in stages.

b. Negotiating meanings – mediating the path toward metacognitive development

> One shares in what another has thought and felt and insofar, meagerly or amply, has his own attitude modified…The experience has to be formulated in order to be communicated. To formulate requires getting outside of it, seeing it as another would see it… (Dewey, 1916, *Democracy and Education*/chap8.html)

Probing questions constituted another essential tool that enhanced the teachers' reflective thinking (through interviews and participant observations). These questions played an important role in mediating the teachers' metacognitive development within their ZPD.

This strategy was found to be useful in fostering the teachers' metacognitive development, as it involved negotiation of the meanings of concepts in reference to the mediation of thinking/learning skills. Such process was assumed to foster additional growth in declarative metacognitive knowledge. The questions led the teachers through further analysis and synthesis of the rubric's categories and criteria, providing another path toward concept formation (Vygotsky, 1962). Development of the teachers' conceptualisation in turn manifests aspects of growth in self-regulation, where embedded

Levels of self-management and control are ascribed to such conceptualisation. In the early stages of the discourse, the teachers understood the mediation concept in the sense of 'external speech' (Vygotsky, 1978); the concept carried a meaning that was used through communication among the research participants and is related to formal concepts. In this situation, two participants can use the same concept (such as 'mediation'), yet each might grasp its meaning in a different way. The next sub-section will present evidence by microanalysis that illustrates this dynamic of growth at different levels of participant ZPD.

4.3.1.6   Micro-analysis

Micro-analysis of the discourse was used to identify and reflect the dynamics that enabled the development of teacher self-regulation. The findings of this micro-analysis will be presented on a chronological axis, focusing on deriving meaning from the different stages of the learning process. Each stage exposes different aspects of the participant structure as it changed following interactions that gave impetus to the teachers' metacognitive development. Furthermore, this analysis revealed interactions that were directed at developing the teachers' conceptualization as a mediating strategy for enhancing 'self-regulation'. Tools that were used for mediating and analyzing the collaborative process will be integrated throughout the presentation of these findings.

The following sub-sections will focus on the teachers who received individual mentoring. First, I will present the dynamic of development in the Hebrew language staff (Sub-sections a through c). The second part (Sub-sections d through f) will allow closer observation through the progress of one teacher (the science coordinator). In this way, various aspects of the discourse interactions that took place through the mentoring will be illuminated, contributing to insights about the mentoring processes that led to teacher empowerment.

a. Staff level of analysis – initial stage

The first stage in the discourse with the Hebrew language staff took place at the beginning of the research on the background of the launching of a new curriculum by the Ministry of Education. This delayed the implementation of the action programme and blocked the teachers' learning process. At that stage, the staff as well as the coordinator included new concepts in their speech that were drawn from the new state curriculum ('external speech', 'scientific concepts'). At the same time, different aspects of their innovations (in skills processing) were abandoned. My questions, together with my comments, were aimed at directing their attention back towards the activity goal.

> Tiki: How are you progressing [in implementing the programme]? Are you ready to map [the pupils'] skills mastering?
>
> Orna: We selected tasks…parts of speech in a textual context and we used the rubric for dialogue with 9th grade pupils. The goal is **to read through the eyes of a writer and to write through the eyes of the reader…and a dialogue will be conducted about this motive…so there will be a global view.**
>
> Tiki: How about adding a task of sentence rewriting, organising the sentences in a paragraph? (i.e., the skills under the languages team's responsibility).
>
> Orna: I will ask that later. First I want them to master 'subject', 'predicate' and 'object' [relating to sentence structure].
>
> Tiki: You may want to utilize the rewrite sentence task as an option for language enrichment?… [or] ask them to turn a number of sentences into a paragraph? [Orna nods]. This will coax them to **connect the components** [of the paragraph] **into a whole**…from this angle they will **build a global picture**. (Emphasis added).

187

At this stage Orna utters expressions taken from the new curriculum (her emphasised words). These words represent 'external speech', formal concepts in use in the linguistic milieu. Using them gave her the power to influence the discourse subject through 'the regulation of the behaviour of others' (Zellermayer, 2004) – in this case her colleagues and the mentor (the discourse participants).

New concepts that merged in the discourse directed Orna's actions, later leading to a corresponding reorganisation of the teaching programme. The questioning was meant to further advance Orna's self-regulating processes. At the same time, my own response showed that her words regulated my behaviour, as I used the same concept she did – "global view" (a concept used in academic jargon that refers to reading comprehension skills) – which became integrated into our dialogue.

My questions and suggestions were aimed at bridging the gap between the level of the word in 'external speech' meaning ('scientific concept') such as advancing the pupils' 'global view' and the teacher's personal meaning. At this stage, a gap in meaning existed between these two poles as it is understood among the participants of the discourse. This gap was expressed in the lack of coherence between concepts used in the team discourse (declarative knowledge) and their actual implementation in practice – there was a gap between their metacognitive knowledge and metacognitive skills. Orna's growing awareness of the cognitive strategies involved in performing a literacy task did not yet transform into an appropriate mediating action. At this stage, the teachers (both Orna and her staff) viewed their innovation and the new curriculum as two separate entities.

b.   Intermediate stage

The following probing questions and comments were aimed at advancing feedback, evaluation and monitoring processes. They evoked new perspectives towards the end of the session.

> Tiki: How are you coming along with the new programme [the new curriculum]?

> Hanna: The new curriculum is directed at an overall view, this is what the new curriculum emphasises. We'll meet on Monday with the whole staff [including Orna, who was missing].
>
> Danna: Settling sentences, continuity, links [are the new relevant skills to be enhanced].

At this stage the teachers were very excited about a new book recommended by the Ministry of Education since it emphasised the rationale of the new curriculum. They felt that there was no appreciation or sense of ownership of their innovation and the tools they contain. The following interaction took place while we were looking over the new book:

> Tiki: How is the new curriculum, the book, different from what you developed?
>
> Hanna: We [the teachers] have the overall view, the general approach…The book [as it is] does not suit the pupils.
>
> Tiki (while observing the book): Do you see a closing of cycles here [ongoing assessment of skills mastering]?
>
> Hanna: Eventually it happens. It is not directed at the pupil. I, as a teacher, will have to do this.
>
> Tiki: The rubrics you have developed accompany the learning all the way and help close another learning cycle each time…all the time reminding the learner where he is in the context of the skills.

Through my questions and comments I tried to examine, with the teachers, how the new book contributes to the development of the pupils' metacognitive knowledge and skills in relations to the required writing skills.

Later in that session, I detected a change while posing questions and coaching the team to value the potential embedded in their constructed rubrics. While in the initial stage of this study, features of reactive behaviour characterised the teacher-mentor participant structure (I was the one posing the questions and suggestions from different angles and Hanna responded accordingly), signs of a proactive approach was becoming apparent. Hanna was offering an alternative course of action in relation to integrating her team's instructional design:

What we need to do is write an instructional plan that specifies in every stage the learning material, book [or] pamphlet we will use [in addition to the book].

As we kept looking at the different sections of the new book, Hanna was the one who asked:

Where in this book are all the emphases they want us to add... This book deals only with writing; and what about reading comprehension?! [With surprise and defiance]

And I concluded:

You will have to build your own curriculum. It seems that you will (be the ones to) produce the book that will include everything…Hanna's new insight gave new stimulus to the staff learning, which drew on the reorganisation of their teaching programme (as manifested in Pamphlet B).

c.   Advanced Stages

In a summary interview with Orna (the staff coordinator), I found signs of increased knowledge about task and self, procedural knowledge and levels of self-regulation:

Orna: [Now] I check if the pupil acquired or didn't acquire a skill. The [mediation] process **involves thinking** [of monitoring, regulating], **continuity**.

Tiki: What do you mean by continuity?

Orna: For example, pre-reading. I **check** [now] if they know or they don't know… Testing relates to **different levels [of the skill], in** continual **cycles** (of learning). In 10th grade **I will take more complex texts positioned on the same axes.**

She continued her explanation and referred me, without my guidance, to expressions of internalization she detected in her pupils. She remarked that her pupils are capable of performing a task without the mediating tools that previously mediated their progress within the ZPD:

Orna: Today the pupils, **even without a rubric in front of their eyes**, when they talk about a paragraph **they themselves say** 'I have a

difficulty in phrasing the main idea'. This is internalization and utilisation [in an emphatic tone]. I feel that in current 10th grades **I am strong** in [mediating] the writing skills. (June 22, 2004, my emphasis)

Feeling 'strong' indicates a level of empowerment, an ability and sense of efficacy in coping with fostering pupils learning/thinking skills. In addition to these aspects, expressions of proactivity were identified in the participant structure. Orna attributed this development to the mentor-teacher discourse:

> Orna: At first there was a blackout (with the introduction of the new curriculum) but after you talked to me, I decided to take what we had done (modules for skills mediation) and integrate [them] into the new curriculum. (June 22, 2004)

In these advanced stages of the discourse with the Hebrew staff (teachers and the coordinator), the gap between external and internal speech diminished (Vygotsky, 1978). The sense of meaningful discourse in mentoring was stronger than ever. Orna ascribed this development to the various mediating tools:

> Hanna, who teaches my ex-pupils, told me that they remember the material very well. When they were in 9th grade, I felt that the tools were a common language between us… (May 11, 2004)

This last sentence expresses the essence of the socio-cultural approach to learning since cultural tools (rubrics and language) are the moulding elements of our thoughts and actions in that they mediate growth in self-regulation.

d. Individual Level of Analysis – the early stages of the discourse

The following discourse events with Tamar relate to the construction of a module for fostering pupil scientific skills (articulating and identifying research questions). These sessions took place at the last stage of the research. (April 28 – June 21, 2004)

During the first stages, Tamar found it important to stress that she knows how to enhance her pupils' research skills:

> I know how to impart [skills] and the pupils know how to ask research questions, to identify assumptions…I already taught the skills and I only need to present a set of activities that will help them, just a little, to reinforce their knowledge.

She was particularly concerned with organising an activity plan that would refresh her pupils' knowledge. At this stage, she thought that a large variety of activities and extensive practice could enhance performance even before diagnosing the pupils' performance level and estimating what appropriate mediation was required. I interpreted this pattern of behaviour as intuitive, naïve-constructivism in her efforts to foster pupils' skills. My suggestions and questions, as shown in the following passage, were attempts to direct her attention to the importance of the assessment process before doing any further planning. To convince her, I suggested using a task she had already assigned as a means for diagnosing her pupils' level of skills performance. This was an opportunity to connect to her prior knowledge, as well as to identify her personal conception of the mediation process:

> Tiki: What would you like to check (in the test assignment)?
>
> Tamar: They learned research skills. Later on, I will check what they know.
>
> Tiki: What were the results of the quiz? (A quiz she had mentioned giving two weeks earlier).
>
> Tamar: I **think they have done well. I only looked them over. I didn't really check them and I don't want to start from this**. I will plan a new series of activities [rejects out of hand diagnosing before planning the mediation for the next step].
>
> Tiki: You'll take the task…with the…the popcorn task? (assignment from the PISA exam)
>
> Tamar: "I don't want to take the popcorn task as is**. I want to add questions**…The pupils will use them to **suggest** research questions and will **phrase** them, perhaps they will **plan** what to investigate on their own."

I used questions in an attempt to guide her toward inner reflection, to monitor what she was doing and to direct her attention towards checking her teaching methods, not only on the "what" level but "for what" as well.   At the same time, these

questions were aimed at identifying her considerations when selecting different steps.

We collaborated on planning a teaching layout based on Tamar's alternative suggestions, while together considering the different methods to be used. Her assumption was that if "I already taught the skills" [then] "The pupils know". In contrast, my concern was to draw her attention to the role of ongoing assessment in order to provide the pupil with the appropriate mediation (scaffolding). In due course, this furthered her conceptualization of the mediation process. This growth progressed through means of 'external speech' (formal concepts, public meaning) and 'inner speech' (personal meaning). Both interweaved through our conversation, in the context of our shared mission.

> Tiki: If you ask them to perform the whole task (popcorn) without your [additional act of] mediation, you will be able to map them [pupils' scores] on all the dimensions of [the] research question …and then decide what you want to focus on.
>
> Tamar: I would change the question altogether. Instead of: 'What are the reasons that some of the popcorn does not pop up?' I will ask them 'Which is the influencing element [independent variable] and which one is being influenced [depended variable]?"

It seemed that Tamar was not yet receptive to my suggestion. Analysis of the discourse revealed that a gap existed between my conceptualization of the mediation processes and hers. At this stage, her experience with the concept did not allow her to transcend to a higher level of internalization. Thus, as Vygotsky (1962, 2004) wrote, we were using the same term but it meant something different to each of us. My concern was to mediate her knowledge to the essence of mediation within the ZPD – providing pupils with the right scaffolding through which they can advance to the next level of learning.

Another purpose of the questioning in the framework of the participant structure was to direct the discourse toward the clarification of meanings. Tamar's use of the concept of 'mediation' at this stage of the discourse was contradictory. My role as a mentor was to reflect on these aspects of its use ('external speech' meaning) and to

help her negotiate the gap in her knowledge (towards internalisation, a higher level of conceptualisation). Using questions and the consideration of alternatives advanced the process to the next stage in her metacognitive development (see Table 3.2, levels of declarative and procedural knowledge relating to acts of mediation).

Tamar's impatience with my suggestions and probing questions was noticeable at this stage. While my intervention was aimed at delaying her actions, giving her more time to reflect on them, it was perceived by her as obstacle on her way to 'marching off to battle' – a metaphor coined by Sigal (October 28, 2003) to describe the teachers' activity spree. In the passage below, my questions were aimed at finding out whether the additional assignments that Tamar has planned were aimed at mediating different levels of the pupils' progress:

> Tiki: Do you want to mediate the [original] question [in the task]?
>
> Tamar: **This is not mediation**. I want them to explicitly identify [the skill component] because I used those concepts with them all the time.
>
> Tiki: On what level will you require the [performance of the] research question [skill]?
>
> Tamar: The research question [in the task] includes the identification of variables and the rephrased isolation of variables…Mediation [will be performed] for acquiring the skills through a story and planning an experiment, which they will perform by themselves...

The concept of *mediation* (as a part of *external speech*, as a *scientific concept*), which I brought into our discourse, was first rejected by Tamar, as she claimed to be conducting a summary evaluation in order to demonstrate 'what they know'. However, the use of the concept in my question prompted her to include a mediation task in her thinking.

Negotiation of meanings, then, was a way to develop the teacher's metacognitive knowledge, while encouraging her to self-regulate her behaviour to include acts of mediation.

The following discourse was directed toward mediating Tamar's metacognitive development in reference to her pupils' skill in articulating research questions. It was aimed at clarifying the significance of the thinking levels embedded in this skill (which is central to science learning tasks). For Tamar at this stage, the use of scientific concepts learned in class was the highest level of their application that was required. The concept of transfer – the level of knowledge applied in a context different from the one that had been learned – was unclear to her at this point.

> Tiki: Look, as far as learning is concerned one may see different levels of knowledge with reference to a concept. If you give the question about isolating variables to pupils who have not studied with you, they will answer according to their intuitive knowledge. Once a pupil acquires a concept, he/she will be able to say that there are variables or reasons but will not have a complete mastery of the skill [level of self-regulation]…i.e. when identifying research questions with all their components.…they will have procedural knowledge. There are [developmental] stages….The highest knowledge is when the learner can use this skill and he integrates different strategies. Even if you ask the question in a new manner [as in new context], they will identify by the content, the topic and conclude that it's a research question [rather than the scientific mode they acquired in the science class) …In fact, [at this stage] they will know how to rewrite the question in their own words.

> Tamar: Ahh… [Nodding as a sign of understanding]

> Tiki: In fact, [this way] the pupil receives a task that is required of him by implementing it beyond the teaching context. If your pupils answer the question without your mediation, it's a sign that they have mastered what you have taught and one can think of the transfer of knowledge.

Tamar listened intently, focused on my explanation and did not reject my remarks. She started to nod as she realised that, in the new tasks she planned [based on PISSA international tests], pupils are required to implement scientific knowledge in an everyday context.

This discussion was significant for conceptualizing what is related to knowledge about a task and, at the same time, knowledge about its mediation. At the end of this session, I tried again to convince her that the key to generating an appropriate task is in her hands. I was determined to show her that diagnosing an authentic problem (relating to her teaching) will help her construct a mediating layout for her

pupils. I was also concerned not to impose my ideas or add a significant burden. I thus, offered her to choose the form of mediation that she needed:

> Tiki: It is enough that you identify some problem [in the quizzes she gave], a difficulty, and around it you build the layout for coping…ways to help improve [your] pupils' mastery. You will decide …the level of skills mastery you want to attain."

At this point Tamar was ready to consider my suggestions:

> O.K., so I need to check the quizzes and map [the pupils' scores], and then we'll make a decision.

This was the beginning of a turning point for Tamar. It generated cycles of learning that led to a change in her conceptualization of the mediation process. The common fallacy that: 'If I taught it - then the pupils learned it', and that is the only thing left is 'to show their knowledge' (as she claimed earlier) was disproven after checking the quiz, and was replaced by a revised set of insights. This new level of conceptualisation will be presented next.

e.   Intermediate stage

Tamar arrived at the next session equipped with more alternative tasks as a response to her pupils' failure in mastering the skill: "I brought some [relevant] assignments to integrate into the task." Here, again, I delayed her rushed plan. The focus of the discourse turned to observation of the products of the pupils' learning. However, the dynamics of the discourse demonstrated that mentoring at this stage was essential. It offered another anchor that delayed action in favour of additional reflective experience, through assessment and monitoring of the task she had given.

> Tiki: So let's first see, considering the mapping, where did they have difficulties?
>
> Tamar: They have not mastered [the skill which relates to] 'research questions'. While studying the tasks together, I found that the test was not valid since the pupils were asked to perform a task that they had not learned yet:
>
> Tiki: They actually had to identify a research question… [but] they were asked [in the task] to formulate a question… It is a higher level.

Tamar did not relate to my comment. She was deeply occupied with the pupils' wrong answer.

> Tamar: They, in fact…I don't know, there are questions here where they referred to only one factor [in frustration]. According to the story [used in the task] they should have asked what the problem was.

In my response I tried again to raise her awareness to the level of thinking required in that task, which was far beyond what her pupils have experienced in class.

> Tiki: So, when you prepare a [diagnostic] map of their mastery level of a research skill, this task [of formulating a question] would be considered a higher level [among the skill's dimensions].

I noticed that Tamar listened intently and I continued my explanation:

> When the pupils are required to identify an influencing factor [independent variable] and an influenced one [dependent variable] in research questions, they perform an analytic level [of thinking]...according to the levels of thinking in Bloom's taxonomy. Here, when you ask them to phrase a question, they do so by themselves, which makes it a synthesis level.

Referring to the levels of thinking embedded in the task's different questions constituted an additional milestone in the discourse interaction. It generated a new cycle of learning for Tamar toward conceptualizing the process of skill mediation. At this point, she was shocked to discover the dissonance between her level of performance in mediating the test task and her perception of her knowledge and skills:

> Tamar: **Wow**…I should not have asked them to phrase…since they have not experienced it with me. They have, in fact, reached [in class] the level of identification.
>
> Tiki: It's amazing that in spite of that they tried [to cope with this challenging level].
>
> Tamar: Yes, some [pupils] phrased rather good questions…I gave the shirt task and forgot all about it. I didn't really want to look at those quizzes, I wanted to move on.

Consequently, being aware of the different thinking levels involved in performing this task, Tamar was more appreciative of her pupils learning abilities: "Yes, some of them really phrased good questions…"

f.   Advanced stages

The process of sharing thoughts, intentions and meaning became transparent. The following conversation illustrates this process and the efforts and struggle involved in clarification of concept meaning:

> Tiki: Actually what I'm doing right now [with you] is learning…and you contribute to my learning…Earlier you said: 'I go to the pupil, enter his thinking. I am aware of this and [now] I don't deal only with the learning material.' You are saying, with regard to skills: 'This is something that I am more aware of now.'
>
> Tamar: Yes [nods in agreement].
>
> Tiki: How do you call it, aware of what?
>
> Tamar: What do you mean?
>
> Tiki: I'm saying that we are now trying to see how to conceptualize this [new awareness]. So…what exactly do you mean when you say: 'I have eyes now. I had eyes before, but now they are focused.'

Tamar listened to me and seemed to wonder where I was heading. I tried to help her turn inside and share with me the meaning she attributes to the concepts she used ('focused eyes', 'more aware'). In this challenging situation, when I couldn't yet translate my growing conceptualisation of metacognitive development to a set of clear guiding questions, I recruited a metaphor, a guiding analogy that came to mind:

> Tiki: Look, I sometimes lose an earring on the floor or on the carpet and I can't see it. I simply throw down the second earring and then, when I [clearly] see it, I know what to look for. Is this the same? When you say now 'My eyes are focused' what are you, actually, looking for?

It seemed that we were able to communicate now as Tamar started explaining:

> Tamar: Actually I am looking for the pupils' abilities. I want to find out where they are with the skill. Everyone has a specific point they reach

in [performing] the skill. So now I can grade them, where each one is…Yes. This means that some of the evidence shows that now I know how to diagnose my pupils.

Tiki: But what are you going to diagnose?

Tamar: On what level they are in the skill.

Tiki: Is it how they answer [questions]?

Tamar: What are you…?

Tiki: It means that… it is possible to say – my pupils – some of them are very good, or, my pupils are very weak. And I say – but what can they do?"

Tamar: It means that instead of saying good and weak [in their skill acquisition level], we will check what exactly they know and what they do not know.

This juncture, which developed due to mutual clarification of what it means to be a skilled learner, marked a turning point. The gap between the *scientific concept* and Tamar's *spontaneous concepts* in reference to teacher mediating role seemed to be gradually narrowing.

In addition, a new participant structure became apparent. During the next months, Tamar acted proactively, empowered to lead the mediation process on her own, while my role as a mentor faded. Her professionalism became apparent, as she demonstrated awareness of her abilities and difficulties when she concluded that: '[The learning experience] helped me understand what I don't know and what I should do'. Reflecting on her actions, with humour, became a manifestation of her empowerment:

> It seemed to me [before] that…the pupils knew and mastered [the skill], so I gave them a summing up assignment. **I didn't call it diagnosing**. And I ask…and surely they know…because I went over this with them… [pausing to stress the irony] I expected superb answers. Fifty three percent didn't know anything… [in an exclamatory tone]. Tiki suggested building on the basis of the mistaken answers. I implemented it in another activity. There, the pupils grade their answers.

At this point she smiled and said: "It needs to be reflected on" – which summarised, in her humorous way, the essence of our reflective discourse.

Characteristics of self-regulation in mediating skills characterised most co-ordinators who were highly involved in the mentoring discourse and innovative activities. A compilation of characteristics that teachers have as mediators of thinking skills as compared to conventional teaching are presented in Appendix 8.

4.3.2 Impact of the Mentoring Model on empowerment of the organisation

Analysis of the findings showed that the promotion of school cultural features is compatible with Senge's (1990) definition of the characteristics of a learning organisation: systems thinking, mental models, personal mastery, shared vision and team work. Empowerment of the school organisation was expressed through the school staff's commitment to achieving the goals of the school's collective activities and its capacity for learning (*ibid*).

The findings were analysed through two theoretical lenses, through which empowering learning interactions in the school organisation were revealed: the first being the characteristics of a learning organisation, and the second being the socio-cultural perspective toward learning and development. The impact of the MM as part of an activity system will be presented in correlation with the approach taken by Minnis and John-Steiner (2001), where micro and macro levels of analysis aim to capture the dynamic character of social relationships and activity.

4.3.2.1 Enhancing systems thinking

Discourse analysis demonstrated the impact of the programme's methodological aspects on the advancement of systems thinking at the organisational level. Action research methodology, as part of the action plan of the mentoring programme, conveyed a structured framework that afforded different levels of learning interactions in the school. As an assessment strategy in the MM, it provided feedback frameworks for monitoring processes which nurtured the enactment of

reflective and evaluative processes involved in the development of the teachers' metacognitive knowledge and self-regulation. Employing action research as a teaching strategy also provided the school with two operating frameworks through which intensive learning and assessment processes led to growth and innovations in the organisation.

Various discourse frameworks afforded multiple communication tracks through which considerations of a new pedagogy of thinking skills were enhanced: management-staff, within subject matter staffs; among various disciplines; the teachers' general assembly; and individual sessions involving mentor-Head-teacher or mentor-teacher/coordinator interactions.

The production of a school curriculum with a thinking skills core, led by the teachers and headed by the subject matter co-ordinators, signalled a broadening of insights and the development of a systems thinking in approaching thinking skills pedagogy. The various discourse frameworks urged teachers from different disciplines to contemplate their performance together. Combining knowledge from different disciplines to create a unified programme leveraged systems thinking in the organisation; teachers had the opportunity to see how different parts of the school activity for fostering their pupils' thinking skills were integrated into a unified whole.

Teachers reported that organisational learning improved their teaching methods. They were able to examine ways of better utilising the limited time resources at their disposal and provide their pupils with more helpful assistance. Here are a few examples:

> Itai: After working hard and internalising [the mediation of skills], **I get more done**. Without it the **history lesson is dead and it becomes frontal.** (Group interview, September 21, 2004 - emphasis added)

Discourse frameworks in the mentoring programme provided teachers with routines through which to share and evaluate their progress with other members of the

organisation. Sigal's expanded perspective provided her with a new outlook on her practice, where she was able to identify principles for effective mediation of the comparison skill:

> There is a huge difference between a class that used the rubric, as it was hung [as a poster] on the wall, and another class where I did not [do so]. I beat my breast for not hanging up the poster in the 8th grade…Today I'm not sure they know what I mean. It certainly affects the dialogue with the pupils. (Group interview, February 21, 2004)

Her willingness to openly share some self-criticism reflected growth in the school's culture. This development of '"openness" – both the norm of speaking openly and honestly…the capacity continually to challenge one's own thinking' (Senge, p. 274), was a significant finding. It signalled the building of a climate where the teachers' learning focused on achieving the school's common goals. Developing systems thinking thus focused the teachers' commitment on organisational growth 'where self-interest is not paramount.' (*ibid*, p. 274)

Expressions such as 'changeover' (Clara), 'transformation' (Sigal) and Itai's saying: 'You ask yourself "What have I taught all these years?"' expressed the evolution of a new perspective, or 'Metanoia' in Senge's words (1990 p. 13) – a fundamental shift in attitude.

Through feedback talks and assessment of existing teaching methods, the teachers were exposed to new points of view that enabled them to critically observe notions that they had previously 'taken for granted'.

> Tamar: 'I teach the asking questions skill as we all [science teachers] do it and are familiar with it, and I know [how to teach it] but I found out that I don't [know]…According to the [state]curriculum, all the schools claim to teach skills. I did that too.'

Her statement indicated that her conceptualisation of herself as knowing how to teach the skill was associated with a consensus that exists in the science teaching milieu. At that point, her words expressed her growing awareness which call into question her previously held perspectives.

Sigal too, in a reflective openness (Senge1990, p. 276), realised that:

> Suddenly, **the same skill that had been completely clear and most familiar**, took on completely different dimensions.' (Sigal, written reflection, October 28, 2003, emphasis added)

According to Schutz (1970), people's assumptions about themselves and their relations with their surroundings depend to a large extent on language, and are conceived as taken for granted. The next sub-section will focus on the impact of the MM on questioning the taken-for-granted when referring to the advancement of thinking skill in school.

The construction of a school meta-language (for mediating thinking/learning skills) was one of the mentoring programme's main goals, as Moshe (the Head-teacher) stated: 'The objective is to teach in one language.' Approaching reality as 'taken for granted' is assumed by Senge (1990) to be a cardinal blockage against new learning in the organisation. Clara's decisive objection to the taken-for-granted was a manifestation of the new insight that she had developed, though she had never read Schutz' or Senge's writings:

> One cannot take for granted that 7th grade pupils know [how to perform literacy skills]. In reading **we used to take things for granted**, e. g. that the pupil should read the title, a picture...**Now I know** [emphasising intonation] **that there are <u>stages</u> and <u>tools</u>. The <u>graphic structure</u> of a sentence, <u>a paragraph</u>, is not to be taken for granted.'** (Emphasis added)

The developed shared language that was used in assessment and throughout the different literacy tasks determined the content of the school discourse. Thus, it expanded the organisation's 'external speech' space (Vygotsky, 1962) to include new concepts in relation to processing skills. Language was the source from which meanings were derived, intentions were developed and clear goals were marked. Accordingly, Tamar, like many of her colleagues, used the different contextual concepts (emphasised below) when analysing her staff's level of progress and defining her implementation of goals.

> There is partial use of **the rubric;** we [the science staff] need to
> activate it…It has not been used [so far] for **diagnostic mapping**.
> There's more place for additional work in the staff…As far as the
> **other skills**, for instance in **the comparison [skill]**, I haven't
> **mastered it,** as Sigal has, and I was not involved in it enough. I need
> to study the [comparison] rubric and after that [to be able] to use
> Sigal's **language.** (Group interview, September 21, 2004, emphasis
> added)

Senge (1990, p. 69) states that '… systems thinking offers a language that begins by restructuring how we think.' Through the mentoring programme, teachers were offered a language which mediated the restructuring of their new perspectives. In addition, it expanded their levels of metacognitive declarative knowledge, as internalisation of concepts increased.

The tapestry of experiences in which the different concepts were intertwined served to direct attention toward meeting organisational goals. The school leadership (management and co-ordinators) developed a new understanding of processes needed for advancing these goals. The following recommendations as presented by the school management and co-ordinators (at the last stage of the research) expressed this growing understanding, which tapped their commitment for ongoing improvements of organisational enterprise that developed from the project:

Accordingly, continual application of the school's shared language was recommended and a decision was made to further involve the interdisciplinary teams:

> The aim is to reach the level where every coordinator will be familiar
> with the skills' key concepts [dimensions] and their teaching stages –
> benchmarks and relating to timetables, through the three-year layout.
> (Meeting protocol, September 21, 2004)

Teacher participation in the different programme frameworks led to their recognition that they need to learn continuously. Indeed, co-ordinators, who advanced considerably through this study, enrolled in external learning frameworks.

They were motivated to expand their knowledge in the area of skills teaching. Four co-ordinators were offered mentoring roles outside the school.

4.3.2.2 Dynamic conceptualisation – a path for modifying mental models in the school

The school's shared language as an inherent part of the mentoring discourse served as a vehicle for developing the teachers' metacognitive knowledge and skills. Many teachers described the fuzziness and ambiguity they had experienced at initial stages of this study. This feeling accompanied the dynamic process of concept internalisation; from a word in the sense of 'external speech' (the organisation's discourse space) to the stage where words turned inward and the individual's meanings evolved ('internal speech'). Sigal highlighted the confusion caused by the different new concepts which were totally removed from the ones she previously held:

> I won't be saying anything new if I tell you that the terms 'processing', 'rubric', 'benchmarks' etc. – confused me and the staff members completely. For a moment (not a short one) we felt an enormous blockage to the whole concept. (Written reflection, October 28, 2003)

Understanding that mental models are especially pervasive when they are widely shared (Senge, 1990), institutionalisation of learning processes and the construction of a school meta-language made it possible to modify old models into new insights. The teachers' metacognitive development and that of the subject co-ordinators in particular gradually turned into shared knowledge. Exposure of the teachers' tacit, intuitive knowledge and the construction of an explicit set of standards increased transparency in the organisation. New insights were manifestations of change in the conceptualisation of a pedagogy of thinking skills. It brought about change, even with teachers who had not, at first, believed in the school innovation.

Itai's case illustrates this transformation. At the first cycle of this study, his attitude was expressed in 'simple generalisations' (Senge, 1990) such as: 'The skills will

only help the strong pupils…They [the strong] will be stronger and the weak ones always remain weak.' By the end of the research, a change in perspectives was apparent. After being involved in several learning experiences (which were led by the teachers in full assembly) and several exercises in his classes, his words illustrate how his previous perspectives had expanded. He concluded:

> The minute you teach skills, you change your way of teaching. We started with skills before you arrived. But now, the best thing I did in geography [was] to teach through skills in class…In the test I use the skill language. I am now less active and the pupils are more active. How, for instance, did we teach human rights? Mostly, the teacher talks in the junior high. The pupils would prefer not to work on skills [they prefer] to listen to a summary of the material. [Now] I bring sheets, not for summing up, and they have to think. This is a great thing I have gained, to change the way of teaching.' (Summarising the group interview, September 21, 2004)

4.3.2.3 Personal mastery – acquiring levels of self-regulation in mediating skills

Various features of self-regulation, such as reflecting, monitoring and evaluation, helped the teachers identify the gap between existing and desired knowledge. Tools integrated into the mentoring programme were used through the mentoring discourse to increase analysis and to delay quick reactions. According to Senge (1990), these aspects express facets of personal mastery – the growing capacity for learning in the organisation. This capacity found expression in five co-ordinators: Clara, Orna, Tamar, Shira and Sigal. The following illustrates their increase in personal mastery:

> There is no doubt that what is so clear to us today – could later be changed by something that we have not previously considered. The point is that today we welcome this process. What we had viewed as sealed and clear today appears to us as something that can and may change. Today it is clear that there is no fixation…This change, Tiki, that has taken place in me and my colleagues, seems to me, to be due to your constant presence in school…(not necessarily physical)…The fact that we can rely on your assistance at any time is what is responsible for those same buds of creativity. (Sigal, written reflection, Sept. 22, 2004)

The above example also connects to the development of personal reflective and inquiry skills as facets of personal mastery (Senge, 1990). Thus, according to teachers' feedback, through its reflective discourse the MM was essential for mediating this growth and the support it lent to the awareness that the teachers developed of the gap between their current practice and the desired vision.

4.3.2.4 Visual tools – vehicles for crystallising meanings in a shared vision

Language was a central cultural tool in the mediation of learning, assessment and construction of the school curriculum. Its integration in various visual tools (i.e. the rubric, teaching module) provided vehicles for its distribution throughout the organisation. The rubric offered a structure that organised fuzzy, abstract concepts into criteria that explicitly defined the required standards for the mastery of skills in the organisation. In addition, it visualised the gradual, multi-level pattern of pupil's development (Table 4.1). Drawing on Senge (1990, p. 128), it empowered participants with systems thinking, which '…means organising complexity into a coherent story that illuminates the causes of problems and how they can be remedied in enduring ways.'

Through the construction of new shared insights, a shared vision came into being. The mentoring process, characterised by negotiating and clarifying meanings through reciprocal learning processes, was essential for this organisational growth (through individual/group reflective discourse). Tamar reflected on the space for growth that the mentoring process provided: 'You know how to lead a teacher according to his knowledge and his abilities and by his initiative.'

Affording conditions for collaborators to reconstruct their mental models in reference to skill mediation made it possible for a '…shared picture of the system as a whole to emerge in normal conversation' (Senge, p. 267). Sharing similar conceptualisation through collaborative process involved in the production of school meta-language for mediating skilled learners contributed to the building of a

shared vision. In addition, the assessment processes that accompanied the teachers' learning provided the 'strong advocates' that the visions need (Senge 1990, p 228).

The use of various representational tools in the frameworks of the MM discourse contributed to the distribution of knowledge as well as to the exposure of gaps between the teachers' existing level of knowledge and the desired one (e.g. Sub-section 4.3.1.5). Senge (1990, p 150) calls this gap 'creative tension' – this tension was essential for generating a constant dynamic of development in the conceptualisation of skill mediation processes.

Mediating these learning processes exploited Kolb's (1984) experiential learning model. Analysis of the different levels of progress in different teams provided an indication of how collaboration and implementation works in the organisation. This process demonstrated interacting cycles of learning (between teams and among team members) (Figure 4.4), which triggered additional learning experiences.
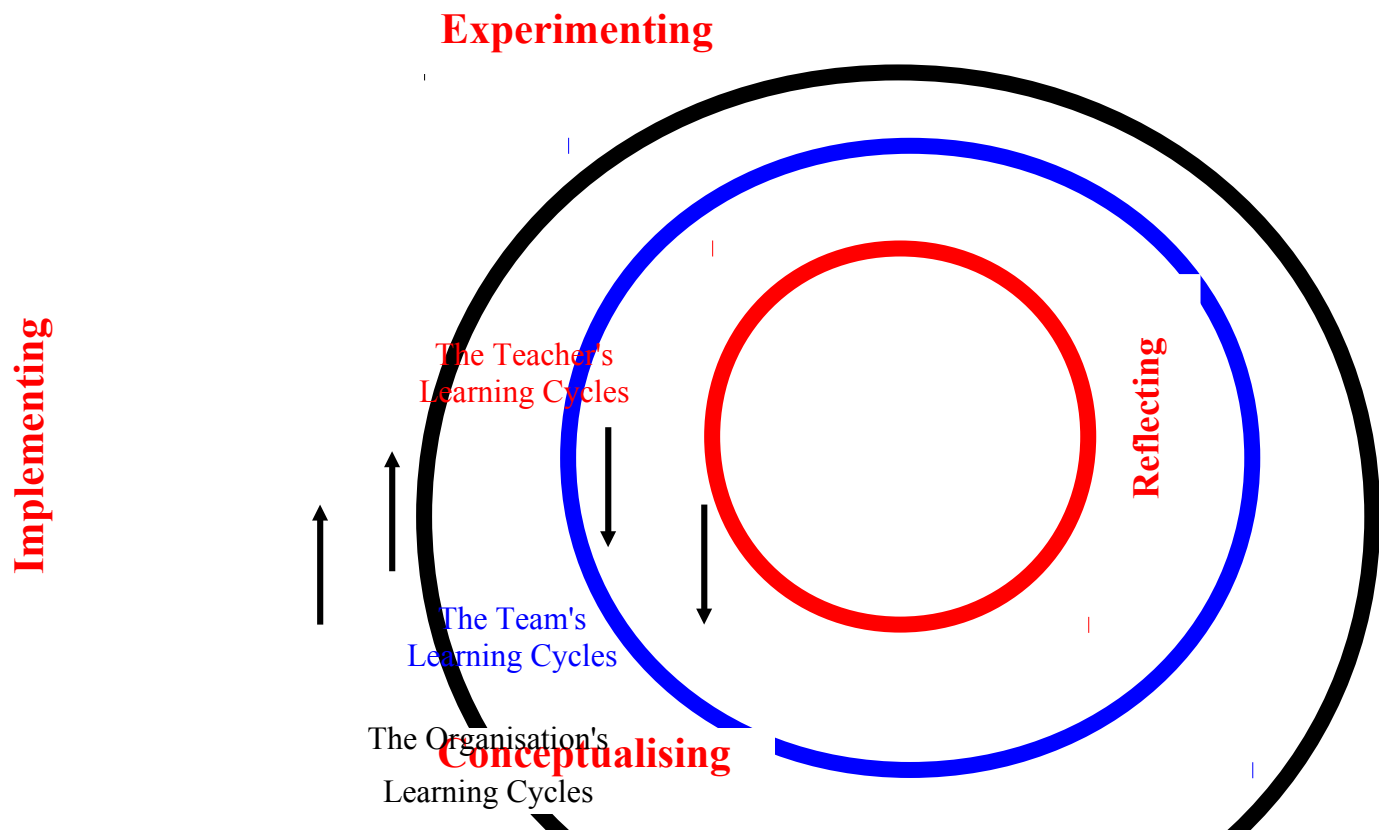
Experimenting

Implementing

The Teacher's
Learning Cycles

Reflecting

The Team's
Learning Cycles

The Organisation's **Conceptualising**
Learning Cycles

Fig. 4.4   Engaging Schools in Multiple Learning Cycles
- Appropriation of Kolb's Learning Cycle (1984, Figure 3.5), to present parallel, interactive learning processes found in this study (at the organisation, team and individual levels (see subsection 4.3.2.4).

Indications of gaps in implementation among the different levels of school activity contributed to the teachers' growing awareness of the continuous efforts needed in order to establish the school's common goal. These processes affected 'even those who think and/or thought that learning for them was no longer needed.' (Sigal, Written reflection, Oct. 2003)

4.3.2.5 Team learning – social mediation in the learning organisation

At the end of each cycle, teacher's responses were collected through individual interviews, staff meetings and written reflections. These responses referred to the impact of the mentoring programme on the teachers' developmental processes, and 81% of the teachers' feedback (173 responses out of 214) revealed that they enjoyed their collective work. This work was conducted in an atmosphere of mutual acceptance, openness and input. Here are a few quotations from the teachers:

> I liked it when we all reached the same thing…I enjoyed <u>learning from colleagues</u>…We must keep on <u>learning together</u>…I liked it when teachers <u>co-operated</u>…I enjoyed the <u>openness and the pleasant atmosphere</u>. (Written reflection, February 2004)

For some co-ordinators, the mentoring programme increased their motivation to develop teaching programmes beyond the action programme:

> Things happen in the school. I sense change, because when I instil skills in my discipline, I hear [from my pupils that] they have learned them in other lessons… (Clara, June 8, 2004)

Orna identified the rubric as a tool with which to develop a shared language in her team:

> While **building the rubric, a mutual fertilisation was created**...Each teacher considered her pupils and built the rubric according to their level, so they can manage their learning by the rubric… The rubric provided me, as a teacher, with **a common language with the team.** It creates order, organisation and control. For example, we were talking about pre-reading, the various stages, identifying the skill components and the order of teaching. [Today] we all speak the same language; **we**

have the same structure and the same process.'(June 22, 2004, emphasis added)

The contribution of collaborative learning also helped to recruit learning energies and to cope with the fuzziness and risk-taking involved in learning. The following excerpt illustrates this point (interview with Orna, June 22, 2004, emphasis added):

> Orna: For the teacher to undergo a process [of change, development], **acceptance is essential**. [Up to now], every discipline has been taught separately - expression, grammar; there was no cooperation with teams of other disciplines. I am not the only one [today] in charge of instilling skills and **I can share with other teachers**.
>
> Tiki: What do you mean by sharing?
>
> Orna: There is sharing. The teacher working with me accepts my way and may also criticise; not only acceptance but criticism as well.

Orna's words as she reflected on her practice sharpened the sense of diversity that is involved in this kind of sharing as related to openness – acceptance and critical thinking among team members.

This development was proven to empower learning processes in the organisation, unlike the situation which exists in many organisations:

> School trains us never to admit that we do not know the answer, and most corporations reinforce that lesson by rewarding the people who excel in advocating their views, not inquiring into complex issues. (Senge, 1990, p. 25)

The various solutions suggested by the teachers for coping with fostering pupils' thinking/learning skills fostered the development of their conceptualisation. It leveraged interdisciplinary interactions, where expressions of creativity and innovation went beyond the goals of the research. Itai and Clara have started cooperating. Itai's history lessons dealt with the contents to be worked on, whereas Clara's English lessons focused on the required skills:

> We work in co-operation. I enjoy working with the pupils on projects and papers. I work together with Itai on history. He brings content knowledge and I implement the [relevant] skills… (Clara, May 4, 2004)

Such collaboration took place among other teams as well (science and languages, bible study and language, literature and bible, and among the language disciplines).

The very pattern of participation between mentor and colleagues, which introduced openness, collaboration, transparency, mutual learning and respect, has been projected on the establishment of similar patterns of participation in the interaction between teacher and pupil.

> Sigal: I'm learning from my pupils, and it's already become natural for them to correct me – we learn together. (December 31, 2003)

In the second cycle of the research, Hanna (a member of the Hebrew staff as well as Deputy Head-teacher) on her own initiative shared her experiences with me from a conference she had attended. She felt empowered and proud of the fact that her school anticipated a change to which other schools nationwide were just beginning to react. This development was in contrast with the belittling behaviour that characterised her staff at the beginning of the research:

> I must tell you, I don't know if it's a joke, if I should laugh or cry…We went all the way to Tel Aviv to meet the superintendents with regards to the new curriculum. It's simply unbelievable. The superintendent stands there and presents a curriculum and everyone attacks her asking: 'How do we do this? Are there any books?' And she says that we should work in stages, to instil the skills separately in a more detailed and clear method. And then Orna and I tell her – 'according to rubrics for skills', and she says: 'Yes, yes, rubrics…' Then she says 'but this only works well for preparatory courses (for adult examinees), not so well for youngsters, and I wanted to tell her: 'We are now starting with rubrics [already] in the 7th grade! (January 6, 2004)

4.3.2.6 Organisational leadership – the Head-teacher's commitment to learning

Moshe's leadership was a central factor in advancing empowering processes in the organisation. His collaboration in the school enterprise and commitment to the framework of the action programme was consistent, even when unexpected tasks appeared on the school agenda. His faith in the goal of advancing pupil learning

and thinking skills challenged the teachers to engage in ongoing learning processes. I described his contribution in my research journal as being 'a lighthouse signalling the ship even on stormy days' (December, 2003). Senge's statement (1990) reinforces these aspects in leadership: 'Ultimately, people follow people who believe in something and have the abilities to achieve results in the service of those beliefs' (*ibid*, p. 360).

This faith, expressed in a personal vision that Moshe had carried for years, had often been mentioned by him, in numerous contexts:

> For years I keep saying [to the teachers] – skills, work on skills. I have always asked for [diagnostic] mapping…and they did not understand my request…Then Tiki came along and it suddenly became clear… (Individual interview, February 10, 2003)

In that context, Senge claims (1990) that it is not enough for the manager as a leader to be a good strategist, determined and charismatic. What is needed is 'translating vision into shared vision' (*ibid*, p 9). Characteristics of the mentoring discourse, tools and programmes in the action plan were found effective in realising Moshe's vision.

The following example illustrates how a tool's structure for the planning of learning contributed to broadening Moshe's systems thinking in relation to the instruction of thinking skills. In an interview during the second cycle of the research, he refers to the formulation of a three-year learning plan, requesting a detailed plan of activities:

> Moshe: 'After all, co-ordinators received version A [Pamphlet A] of the programme…at the end of the second cycle [of the research]. I would like to see a new pamphlet come out [Pamphlet B] in which each team presents a learning programme which integrates the skills to be instilled [under their responsibility].'
>
> Tiki: 'What is missing in the programmes presented by the teachers so far in Pamphlet A?'
>
> Moshe: 'What I miss is exactly the part in which I want you to mentor the teachers. How to integrate goals, learning topics and timetable with instilling skills…Books are not the main thing, the main thing is to integrate the school skills that are the school language through the general school curriculum…' (Individual interview, December 2, 2003)

The new tool for curriculum planning (through its content table) related to three additional concepts that were missing in the previous planning tool in use by the school staff. These referred to the integration of skills, their assessment and reference to mediation in the three-year sequence. Previous planning tools did not explicitly refer to skills or their assessment, thus avoided new pattern of pedagogy that Moshe's vision aimed to enhance.

Moshe's previous expressions were interpreted as another obstacle preventing him from realising his own vision. This was expressed in his disappointed and derisive attitudes toward the teachers:

> For years, I asked the teachers to indicate the skill that had been examined, but when analysing the test they keep on listing the number of the problematic questions (September 19, 2003).

Senge clarifies this point (1990, p. 40):

> When there are problems, or performance fails to live up to what is intended, it is easy to find someone or something to blame…More often than we realise, systems cause their own crises, not external forces or individuals' mistakes.

Tools for curriculum planning that were integrated into the action programme and discussed in the mentoring discourse helped Moshe, the Head-teacher, identify a gap between his desired goals and the means he previously offered to teachers for reaching them. These tools contributed to his ability to clearly specify to his staff what he expected of them. The aspect of the tool's structure illustrated, more than anything, how 'structure influences behaviour' (*ibid*, p 40).

Furthermore, the Head-teacher took it for granted that the teachers can identify with the general motto 'teaching goals', a term that implicitly includes content and skills. This general view led him to conclude that the teachers had for years not paid attention to his desired goal. Senge (1990, p.193), calls this a 'leap of abstraction' the tendency not to question our generalisations.

Nonetheless, advancing the Head-teacher's vision to achieve a common language for the organisation could not have been actualised without his full commitment. Leading the school's action goals thus supported the organisation and the mentor throughout the process:

> I consider this goal top priority, no matter what the cost. I do not mind saying to the staff that this will be at the cost of the heterogeneity programme [a new programme, headed by Hanna, the Deputy Head-teacher]. We'll take care of that over the summer. The question is where are we stuck and how do we get on? (Moshe, February 3, 2003)

At the end of the study, Moshe claimed that he had undergone a change that he does not dictate anymore: 'I stopped holding the reigns.' (August. 2004) He tried to provide the teachers with opportunities to initiate solutions within the areas that concern them. Senge's words shed light on the relationship between broadening systems thinking and these findings: 'In mastering this discipline, leaders learn the counter-productiveness of trying to dictate a vision, no matter how heartfelt.' (1990 p. 9)

4.3.3 Impact of the Mentoring Model on mentor empowerment

Learning processes and their mediation tools contributed to teacher empowerment, and also affected me, empowering me as a mentor. This unexpected development, revealed towards the end of the second cycle of the research, explains the additional sub-question added to this thesis.

Analysis of the MM as a form a collective learning activity (Engeström, 1987, 1999), through its programme and process had the following impact on my own empowerment:

> A. They assisted me in conceptualising (Table 4.3) and developing my capabilities in mentoring the teachers' metacognitive development.

B.   They helped me develop a sense of satisfaction and efficacy in mediating collective learning processes in the school organisation.

The following findings shed light on the impact of the cognitive, emotional, social and cultural aspects of the MM which contributed to this growth.

4.3.3.1   The impact of the Mentoring Model on mentor metacognitive development

Review of the research findings identified many areas of interface between characteristics of teacher empowerment and my own development of conceptualisation and self-regulation as a mediator of teacher learning. This implied that I developed metacognitive knowledge and skills relating to performing the task of mentoring school activity.

Table 4.3   Expansion of Theoretical Perspectives

Theoretical perspectives		Research Cycle	
Constructivist			
Mentoring centred on the cognitive aspects of teacher learning and thinking. Discourse directed toward evoking conceptual change through engagement with the teachers' prior knowledge.		Initial stages	
↓			
Providing teachers with an active experiential environment through the construction of instructional tools.			
↓			
Accenting collaboration and support for the emotional aspect of learning.	The Mentor's Zone of Proximal Development		**First cycle**
↓			
Adopting the 'learning organisation' (Senge, 1990) framework in order to create an environment that triggers conceptual change through social interactions.			
↓			
Realising the impact of cultural tools and their patterns of interaction with the social, emotional and cognitive aspects of learning		Final stage	
↓			
Socio-cultural			
Socio-cultural perspectives (the Vygotskyian approach) adopted as an overarching theory (integration of cognitive, educational, social, and organisational psychology)		Initial stages	**Second cycle**
↓			
Progressive levels of analysis led to the integration of theories from social sciences, learning and brain sciences.		Final stage	**Third cycle**

4.3.3.2 Mentor empowerment through a dialectic between theory and practice

An ongoing dialectic process between theory and research findings as an element in the MM reflective discourse broadened my personal conceptualisation (Table 4.3) and made it possible for me to better understand and foster developmental processes within the school organisation. Like the teachers, I became better aware of learning processes in general and my own learning processes in particular. By using different theoretical lenses that deal with the construction of knowledge, new understanding evolved, adding to my sense of confidence and determination in leading shared learning processes.

This dialectic between theory and practice allowed me time to delay my reactions and afforded me with new concepts which guided me toward effective mediation of teacher learning. The findings below illustrates how the writing process provided me with a framework, where discourse included my reflection on my own actions and on the work of other scholars. This methodology, as an integral part of the MM action programme, mediated my growing understanding of mediation processes. The following is one example, taken from the second cycle of the research. It highlights a specific juncture where new and empowering awareness occurred:

> The proposal in the article [Darling, 1998] is: How to form a system that leads to personal growth in the context of the project? It is amazing how this is exactly what I have asked in this action research: how to empower my teachers through their system, the [school's] mentoring program… with thinking skills orientation!! Wow! **This reinforced my chosen direction considerably.** Now my thinking is no longer on the intuitive level [where I started]. Now I am more aware and it leads me to rational planning: The role of the 'evaluator' is to support the partners throughout the process. Therefore, my condition is: "Process is conducted in a manner that does not contradict the aims and methods of A.R" (*ibid*). In a meeting with the [Hebrew] language team tomorrow I will emphasize how important it is to stop and consider where everyone is in defining the original goal and as an answer to the need to integrate the [State] new curriculum**; to find out what and how it is done. This way is recommended** by the article as well as a means to provide the teachers with a sense of ownership and of understanding the changes on the road to achieving goals. This approach puts stress on the questions: what, why and how. It is recommended that the participants be convinced that personal action research will benefit them. In the last

meeting I actually used [these questions] with the English team [through the knowledge management tool] where each participant defined a goal they will strive to achieve ... (Personal journal, December 4, 2003)

Likewise, literature on organisations, and particularly Senge's work (1990), deepened my understanding that my choice in assisting teachers in developing school meta-language basically reflected a systems approach that was responsible for their empowerment through the school activity. Senge's ideas were used to shed light on processes and leveraged the use of tools (such as the rubric that generated the integration of language and advanced the teachers' progress).

Awareness of the inventive act (Engeström, 1999) of the rubric tool in this study led to my empowerment through a growing sense of satisfaction and perceived efficacy (Bandura, 1986). This empowerment derived from my realisation that the appropriation of the rubric tool from its original function is the manifestation of an innovative act (Engeström, 1999); from a formative assessment tool for teaching to that of mediating teachers' and organisations' developmental processes

My growing awareness of the teachers' developmental processes from intuition to growing levels of self-regulation contributed to my growing reflexivity and sensitivity to the teachers' feelings, and to my ability to mentor learning processes in the organisation. Analysing patterns of participant structures through discourse analysis (Wertch, 1985) directed my attention to the needed reaction or, alternately, to delaying it. In cases where the teacher was occupied with a troubling experience that did not concern the research goal, I let the teacher lead the discourse for a while. In other cases, where I sensed signs of proactivity, I delayed my intervention and allowed the teachers to lead (last general assembly sessions). The evolution of my skill in leading teachers towards engagement with a shared vision and goals, in reference to mediating thinking skills served as a source of empowerment for me – a growing sense of capacity (read more in Appendix 7).

4.3.3.3 Impact of interactive analytical tools – development of mentor mediation skills

My broad conceptualisation of teaching, learning and mentoring processes found expression in the development of my mediation skills as a teacher-mentor. My new conceptualisation related to teacher metacognitive progress as a multi-faceted process, corresponding with the cognitive, emotional, social and cultural aspects of learning:

Cultural aspect	Mentoring the teachers' progress involved the construction and use of various cultural tools for planning and analysing teacher progress; the ZPD analysis model, Kolb's learning cycle (1984) and rubrics (Chapter 3).
Cognitive aspect	The above tools assisted me in: - Understanding major principles associated with effective skills mediation. - Regulating the teachers' mediation strategy. - Observing and collecting specific descriptive data of teacher performance. - Planning gradual progress, drawn from the ZPD analytical tool. - Assessing levels of individual and organisational learning through sequential cycles of learning.
Emotional aspect	Displaying sensitivity to individual differences among the teachers and providing emotional support while guiding development within their ZPD.
Social aspect	Modelling and coaching mutual learning interactions (e.g. using rubrics for negotiating meaning with pupils in relation to their performance).

4.4 Summary of Findings

4.4.1 Impact of the Mentoring Model on teacher empowerment

- Engaging the teachers with their prior, intuitive knowledge.

- Advancing the teachers' metacognitive knowledge and mediation skills within their individual ZPDs.

- Reinforcing the teachers' trust in their pupils' potential for growth.

- Nurturing the teachers' sense of efficacy in advancing their pupils as self-regulated learners.

- Offering diagnostic tools for assessing their pupils' level of development.

- Developing conceptualization of mediation processes directed at promoting self-regulated learners.

- Equipping the teacher with tools for dialogue, which foster meaningful negotiating processes with their pupils.

- Fostering 'evaluation dialogue' (Nevo, 2003) with the pupils through formative assessment, free of judgmental perspectives.

- Enabling the teacher to mediate their pupils' progress within their individual ZPDs, with the end in mind of mediating a successive learning track

4.4.2 Impact of the Mentoring Model on organisational empowerment

Fostering Systems thinking – structuring a coherent discourse in the school

- Enriching the school as a multi-cultural learning environment.

- Enhancing change in participant structures.

Fostering conditions for personal mastery

- Fostering transparency of school standards and highlighting **school goals and values.**

- Providing a mediating framework through which to develop teacher capacity to engage in continuous learning processes.

Fostering a shared vision

- The collective discourse provides frameworks for negotiating meanings, which crystallises a common vision.

Mediating transformations in mental models

- Fostering a nurturing environment which promotes metacognitive pedagogy. Support related to the emotional mediation needed for such developmental growth.

Facilitating teamwork

- Fostering a culture of open, reflective dialogue – developing trustful relationships (in subject teams and in interdisciplinary teams) which lead to shared innovation.

4.4.3 Impact of the Mentoring Model on mentor empowerment

- Providing a multi-channel framework for conducting a reflective discourse in the school.

- Providing multi-functional tools for mediating the teachers' metacognitive development within their ZPD.

- Mediation tools are also used for analysing the teachers' progress from the intuitive to expanded levels of metacognitive thinking in skills mediation.

- Integrating a methodology for mediating the mentor's metacognitive development:

- Writing a personal journal and holding of a dialectic with the professional literature as part of the MM programme provided an effective mediating path for mentor's professional development.

4.5 Cross-Analysis between the Different Levels of the Findings

The multidimensional impact of the MM on teacher empowerment can be demonstrated by cross-analysis between the different levels of the findings. The programme and the mentoring process generated multi-level interactions between the developmental processes experienced by the teachers, the organisation and the mentor. These provided a learning environment through which to experience the exhilaration of mutual learning. The mentoring process provided a framework through which cognitive, emotional, social and cultural levels of learning orchestrate a dynamic of reciprocal growth, one where mentors, teachers and the organisation empower one another. The rubric was demonstrated as one of the central tools of the MM (Figure 4.5) for leveraging developmental processes at each level of the collective learning activity. These generative, reciprocal interactions will be discussed in the following chapter in which the holistic approach of the MM and its impact on teacher empowerment will be illustrated.
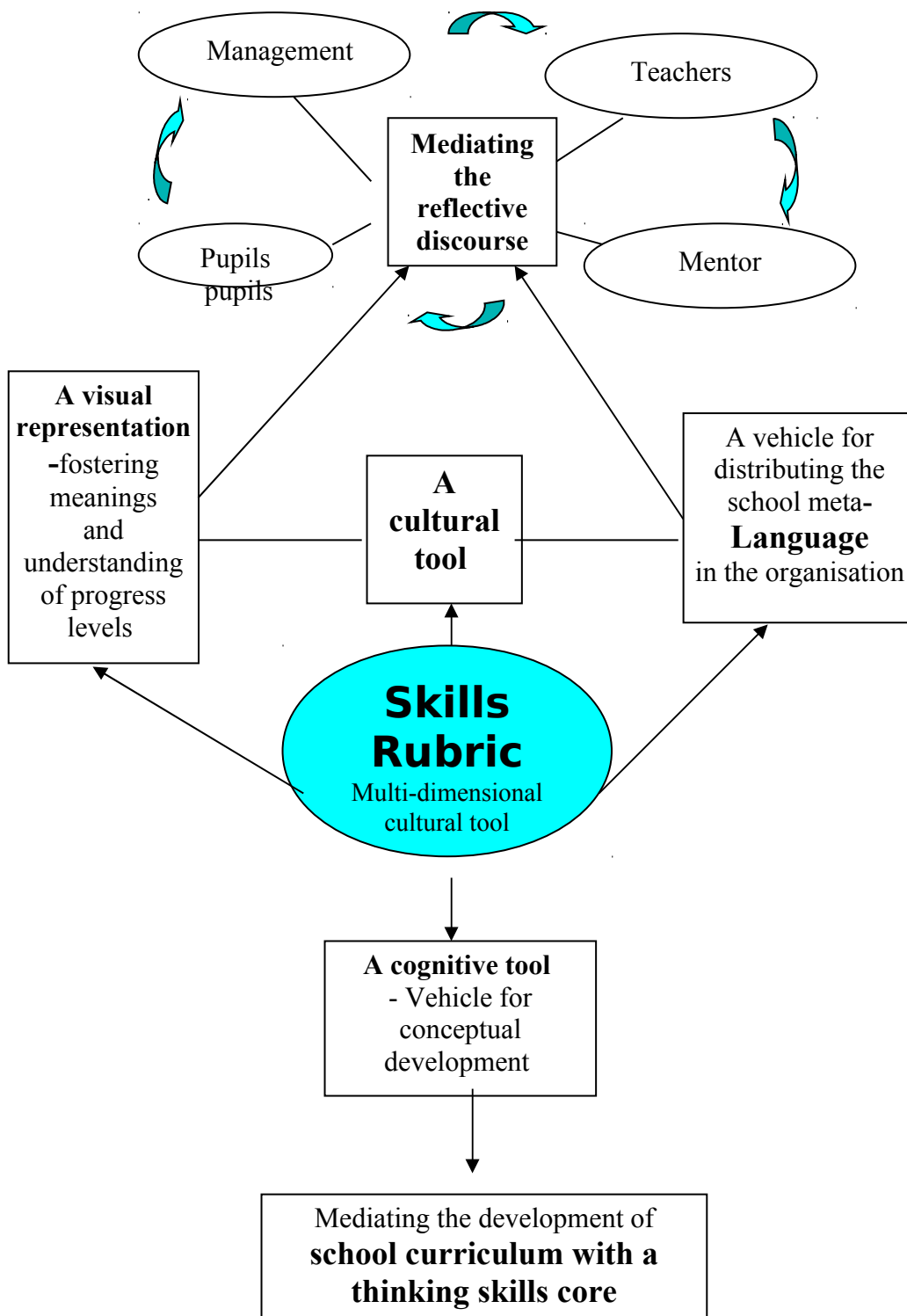
Fig 4.5:   **The Rubric – a multidimensional cultural tool**

Chapter 5   Discussion

5.1   Introduction

Creating change
will have to proceed with joint effort
and on a pilot, evolutionary basis. (Fullan, 2007, p 36)

The Mentoring Model's holistic approach to the metacognitive development of teachers has been shown to be effective in enhancing teacher empowerment. While the interpretations and initial discussions that were presented in Chapter 4 related separately, for purposes of analysis, to the teachers, the organisation and the mentor, this chapter will accent reciprocal and multilevel developmental interactions between these three system components (Section 4.5). Adoption of a framework of collective learning activity (Engeström, 1999) assisted in exploring the impact of the MM, and how its programme and process related to the teacher, the organisation and the mentor as parts of a single system (Figure 3.4). Teacher empowerment will thus be presented as an integral part of the school activity system. This approach accents Vygotsky's (1962, 1978) developmental perspectives, where learning and knowledge construction are socially-mediated processes. When these processes are accompanied with emotional mediation, they are shown to be a successful framework for mentoring teachers.

This discussion will accent the complex cyclical and dynamic processes involved in teacher development (Vygotsky, 1962; Senge, 1990; Fullan, 1993 1999; Hargreaves, 1994). Though many policy-makers expect progress to be a linear process characterised by an accumulation of incremental changes as a result of a neatly-planned programme (Fullan, 1993, 1998; Senge, 1990), the following sections will discuss the non-linear process of teacher empowerment while accenting contradictions and unexpected turning points that led to innovations (Engeström, 1999, 2001). I will focus on several mediating elements in the MM which evoked parallel developments in all parts of the activity system.

Given these multilevel considerations, I intend to discuss each research question in a way that highlights the central elements that converged to foster teacher empowerment. In accordance with Guskey's recommendations (2000, p. 33), which are based on a two decades study of professional development models, this discussion will avoid the gloss of "overall" or "general" effects. Instead, the discussion will focus on specific junctures that led to teacher empowerment by using multiple theoretical lenses to illuminate them.

The following section (5.2) discusses the main question of this study (as crystallised through the second and third cycles) with reference to the impact of the MM on teacher empowerment through the following sub-questions:

a. What impact does the mentoring model have on the development of the teachers' *metacognitive knowledge* when mediating the learning of thinking skills?

b. What impact does the mentoring model have on the development of the teachers' *metacognitive skills* when mediating the learning of thinking skills?

c. What impact does the mentoring model have on teacher *satisfaction and sense of self-efficacy?*

Discussion will focus on the interactive pattern of these aspects of empowerment as indicated by the research findings.

5.2 The Impact of the Mentoring Model on Teacher Empowerment

Teacher feedback in this study indicated that several mediation tools incorporated in the MM had a major impact on their knowledge and competencies. Their development in managing mediation processes was expressed in a growing sense of autonomy and control, which are central aspects of empowerment (e.g. Lightfoot,

1986; Kreisberg, 1992; Short and Rinehart, 1992; Zenz 2000; Page and Czuba, 1999; Zimmerman, 2000).

These findings are particularly valuable considering that recent studies point at the difficulties that teachers encounter when learning and implementing thinking skills pedagogy (Leat and Lin, 2003; Zohar, 2006 Harpaz, 2006). Zohar (2006) cites several researchers who claim that the change from traditional to reform-oriented pedagogy is very difficult, if not impossible, to implement. One of the barriers, according to Leat's findings (1999, in Leat and Lin, 2003:388) is the teachers' need for 'easily maintained routines'. Another difficulty is coping with the numerous theories and concepts used in the "thinking industry" (concepts, seminars, journals, learning materials) (e.g. Harpaz, 2006) which makes it hard for teachers to understand and mediate higher order thinking.

In contrast, the teaching strategy that was employed in this work as part of the MM was found to have a significant impact on teacher metacognitive development. Teachers embraced this strategy, as its explicitness, coherence and the gradual processes it led were perceived as easily learned. It responded to their needs for specific descriptions of action that they could use (Leat and Lin, 2003), avoiding the common difficulty of translating the general principles of research into practice (Black and Wiliam, 1998, cited by *ibid*). Nonetheless, in due course, this strategy (for mediating their pupils' thinking skills) was found to be challenging and demanded the teachers' intensive involvement in a process which fostered their own metacognitive developmental and elevated their sense of empowerment.

This impact of the teaching strategy is best understood when viewed as part of the MM's holistic approach to teacher development. This holistic approach incorporates the MM's multi-perspective approach to teachers learning and development, and thus serves as a vehicle for enhancing developmental processes in school. Attention to cognitive, emotional, social and cultural mediation involved in the learning process as embedded in the conceptual framework of the research (Figure 2.1) is an

expression of this multi-perspective approach to the teachers' metacognitive development These aspects, when integrated in the teaching strategy, were found to be productive for empowering teachers.   Many metacognitive training programmes, on the other hand, are characterised as 'unduly cognitive', where differences in socio-cultural background and values of the trainees are not considered (Lin, Schwartz and Hatano, 2005, p.53).

Many studies on empowerment have focused on assessing individual teachers' empowerment (Somech, 2005, Somech and Ron, 2007).   This study, with its holistic approach, views individuals' empowerment as a product and a process of multilevel learning interactions.   Somech's (2005) findings support this approach, showing the links between teachers' commitment to the organisation's enterprise and their professional development.   However, in this study, teachers were provided with various levels of learning interactions in addition to teamwork (interactions with multidisciplinary teams, management team).

The integration of various theoretical perspectives, as applied in this work (Vygotsky, 1962; 1978; Bandura, 1986; Engeström, 1999, 2001; Senge, 1990; Pintrich, 2000; Atkinson and Claxton, 2000; L, Atkinson, 2000; C, Betsch, 2007 ; T, Betsch, 2007), receives growing support when studying educational change in different contexts and settings (e.g. Wertsch, 1995; Desforges, C., 2001; Freedheim and Weiner, 2003; Ogawa et al, 2006).   This approach was valuable as it provided a wide perspective through which to conceptualize the impact of the MM as a multidimensional developmental tool. It was essential for understanding the dynamics that foster teacher empowerment through metacognitive development, and their growing sense of satisfaction and self-efficacy.

Conceptualisation of teachers' empowerment, as derived from the findings, shows that three main resources were exploited by the MM which will be used to explain

its significant impact. These enabled teachers to build on their inherent human capacities to learn, which is often taken for granted in the school:

- **Teacher intuitive and metacognitive modes of thinking** for coping creatively in the school's complex dynamic environment.

- **Social interactions for mediating teacher metacognitive development within their individual ZPDs** (zones of proximal development).

- **The generating potential of language as a methodological tool.**

Each of the following sub-sections will accent different levels of the cognitive, emotional, social and cultural mediation encompassed in learning and metacognitive development.

5.2.1 Integrating the teachers' intuitive and metacognitive modes of thinking

5.2.1.1 A path for metacognitive growth and self-efficacy

An interesting finding, in which teachers continuously relied on their intuitive thinking parallel with their metacognitive growth (Figure 4.3), drew attention to the significant role of intuition (implicit knowledge) on their empowerment. In this regard, T. Betsch (2007) claims that research has neglected the nature of intuition with reference to judgement and decision-making. Similarly, studies on teacher metacognitive development (e.g. Zohar, 2006) value explicit monitoring and control processes and highlight the limitations that implicit/intuitive knowledge has on effective teaching of higher-order thinking skills. Reference to both intuitive and metacognitive modes of thinking and their interactive impact on teacher professional development and empowerment is another aspect that distinguishes this thesis from others.

L. Atkinson's (2000) work helps clarify the unique relationship indicated between intuitive and deliberate/metacognitive modes of thinking. It fosters understanding of the dynamic that led to teacher self-regulation (Pintrich, 2000) and their willingness to engage in strenuous and continuous cycles of learning (Kolb, 1984). Accordingly, the nurturing of intuitive thinking fosters the teachers' trust in their own judgement (*ibid*). Factors such as support, structure and direction that L. Atkinson accents as nurturing the enactment of intuitive thinking (*ibid*) are embedded in the MM and will be highlighted throughout this discussion.

Providing teachers with discourse frameworks afforded them opportunities to reflect on their actions and receive supporting feedback on their intuitive responses (e.g. Sub-sections 4.2.5.2; and 4.2.5.5) This can explain the teachers' increased confidence in continuously relying on this mode of thinking in subsequent events (Figure 5.1). A correlation that was made by L. Atkinson (*ibid*) between a reliance on intuitive responses and confidence in self-efficacy further highlight the impact of the MM on the teachers' metacognitive development. Through their engagement in sequential effortful learning cycles (Kolb, 1984), the support that the teachers received through the mentoring reflective discourse increased their confidence in their self-efficacy. Those same processes that encouraged engagement in an intuitive response (Figure 5.1) enhanced self-regulation. Reflection on actions and thinking, through processes of negotiating meanings within their individual ZPDs, fostered the teachers' awareness of their strengths and weaknesses in relation to previous events. Moreover, reflecting on previous intuitive responses also clarified directions towards which they were able to regulate their mediation activities more effectively in class. The clear direction and the organised discourse structures, in turn, nurtured the teachers' trust in their own judgement (Atkinson, L. 2000). When the object of the collective activity was clear, the teachers were able to perceive and validate the results of their intuitive responses (*ibid*).
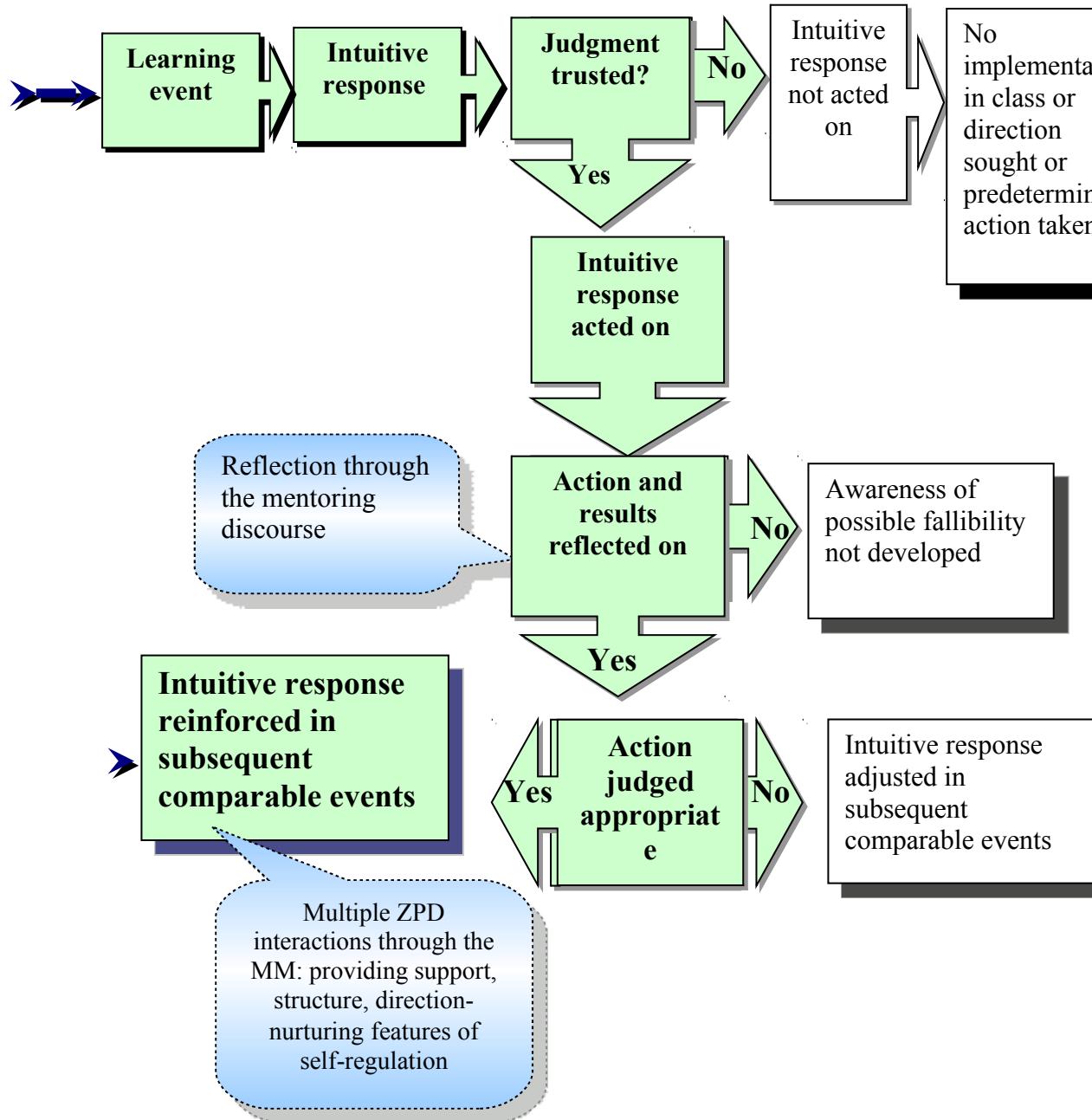
Figure 5.1: Nurturing teacher intuitive thinking towards growth in self-regulation based on Atkinson's presentation of "the relationship of judgement to the intuitive response" (L. Atkinson, 2000, p. 55)

Highlighting teachers' developmental processes in this way reflects the influence of various interacting factors in a given system (Vygotsky, 1962; Senge, 1990), and is an expression of the research's unique holistic approach (Ratner, 2008) to teacher development.

Taken that intuition is the most adaptive thinking strategy the people have for coping with a dynamic complex environment (Fischbein, 1982; Claxton, 2000; T. Betsch, 2007), supporting its enactment was highly useful in face- to- face, unpredictable classroom interactions (Vanderstraeten, 2004). As observed in this study, teachers' continuously made use of a teaching strategy (e.g. rubrics, teaching modules) while implementing the different tools that were made available to them through the MM. The trust in their own judgement guided them in those situations where acting by the rulebook was not sufficient. It was evident in this regard that teachers who took a less active part in the mentoring discourse tended to **strictly follow the textbook**, while the active ones, e.g. the subject co-ordinators, who developed this trust, simply used textbooks as one of their available resources.

Findings indicated that the teachers' growing sense of satisfaction from receiving professional acceptance from their colleagues (e.g. Sub-section 4.3.2.5) was an additional contribution to their enhanced trust in their own judgement. Considering that developmental processes are socially mediated (Vygotsky, 1962, 1978), framing the MM within the school's collective activity (Engeström, 1999) provided discourse frameworks through which teachers were able to receive such social support.

Bandura (1986) provides an additional angle through which to understand the impact of social support on the metacognitive development of teachers. According to Bandura, concern over what others might think may become more important than the actual skills that the teachers possess. Such concern can influence the execution of competencies, which explain why collegial acceptance that the teachers received was appreciated by them as significant for their growth. Enhanced belief in their efficacy, as a result of such support, encouraged further experimentation and opportunities to test their skills. In the absence of such support, on the other hand, such growth is hindered (*ibid)*. This dynamic can explain why the teachers (Orna, for example) indicated that they had not been able to use the tools that they possessed in the past as well as the ones that they collectively developed in this

study. It is reasonable to assume that the lack of social feedback in the past limited trust in their own judgement of how to use them effectively.

Teachers' engagement through the mentoring programme in sequential learning cycles (Kolb, 1984) over a period of three years provided them with a unique opportunity for developing their metacognitive knowledge (Flavell, 1976; Brown, 1978; Pintrich, 2000); knowing what to do, how and where, and exercising their skills. These processes supported their confidence in their efficacy (Bandura, 1986). **Alternating between intuitive and** metacognitive thinking (Figure 4.3) was assumed to nurture their sense of self-efficacy, just as the testing of alternative thinking strategies and behaviour assumes to enable teachers to use their skills effectively in diverse situations (*ibid*). Indeed, most co-ordinators who were intensively involved in these processes expressed a growing sense of satisfaction and self-efficacy. Others who where content with their growth in metacognitive knowledge (as for example Eli at the end of the pilot study, in naming strategies and their procedures), without engagement in further experimentation for testing their competencies, lacked that operative efficacy (*ibid).*

Vygotsky (1962) further highlighted the relationship between teacher intuitive knowledge (spontaneous concepts) and metacognitive knowledge and skills (scientific concepts). Accordingly, a lack of a deliberate control over the mediation process can be ascribed to those teachers who developed awareness of the requirements of a given skill but lacked the extent of practice and reflection needed to master it. The mastery of higher order functions (such as self-regulation and conceptualisation of the mediation act) progresses after it has been used and practiced over time (*ibid*).

Variability in reliance on different knowledge and thinking modes (intuitive, declarative and procedural metacognitive knowledge, self-regulation) (Figure 4.3) supports metacognition theory and studies (e.g. Pintrich, 2000; Zohar, 2006). Pintrich's model of self-regulation (2000) similarly accents the non-linear process that is involved in applying different metacognitive patterns. Zohar (2006) accents

the complexity involved in this process. This thesis has a particular interest in understanding the relationship between different thinking strategies and the impact of multiple mediation tools that generate such complex developmental processes. Vygotsky's framework of teaching and learning within the learner's ZPD was found productive in the study of this relationship.

5.2.2 Social interactions that mediate teacher metacognitive development

In a way compatible with this thesis, socio-cultural research is involved in examination of interacting learning processes, where teachers engage in a collaborative activity and dialogue that includes curriculum innovations (John-Steiner and Mahn, 1996; Zellermayer, 2004; Wells and Claxton, 2002; Claxton, 2008). Collaboration between the mentor and school staff through dialogues that focus on curriculum innovations exploited the impact of cultural and social mediations in the teachers' workplace. The teachers' appreciation of such mediation lent additional support to Vygotsky's (1978) notion of an effective developmental process when teaching corresponds to the learner's ZPD.

The ZPD framework supported the dialectic between the teachers' intuitive/spontaneous conceptualisation of mediating thinking skills and scientific/metacognitive ones. As these processes accented the gradual nature of developmental process through cognitive, emotional, social and cultural mediation, the ZPD notion (Vygotsky, 1978) was seen to be an appropriate framework in which to nest.

Mentoring the teachers' progress from their high reliance on intuitive thinking toward increased use of metacognitive strategies was initially adjusted to engage with their prior knowledge (Ausubel, 1968; Wells, 2000). This approach, which accents the importance of the cognitive level of mediation, is supported by Wells (2000) who asserts that the individual's current understanding is the most important

resource for effectively mediating the desired transformation. Without it, any other mediation, whether a cultural tool (e.g. books, video or other visual representations) or a social interaction will not do. The rubric tool served as a vehicle for engaging the teachers' prior knowledge

Most studies on the impact of rubrics focus on the development of student learning and self-regulation, while the teachers' developmental processes serve as means for meeting this end (e.g. Andrade and Du, 2005; Reddy, 2007). In this study, a similar impact was indicated by the teachers in their use of rubrics in teaching, learning and assessment of pupil progress. Nonetheless, what distinguishes this work is its focus on teacher empowerment, where rubrics construction was demonstrated as a powerful vehicle for enhancing their self-regulation, satisfaction and sense of efficacy.

An interesting finding was that the analysis and synthesis which were involved in the construction of the skills rubric (Table 5.1) engaged teachers in processes that Vygotsky (1962) ascribes to concept formation. Developing teacher conceptualisation of their mediation role probably progressed through the mediation of the construction of the rubrics. As such, the rubrics mediated the mentoring discourse through the negotiation of meaning within each teacher's ZPD (Vygotsky, 1962) (e.g. Sub-section 4.3.1.5)

Table 5.1: Impact of analysis and synthesis on teacher conceptualisation of skills mediation through the construction of skills rubrics

Mediation of skills within each pupil's Zone of Proximal Development

		Analysis process - Led by the articulation of performance criteria to each of the skill's dimensions		
	Progression **Dimension**	**On the way** **(beginners)**	**Advancing**	**Mastering**
Synthesis process *Led by categorisation, crossing of*	**Rubric construction through processes of negotiating meaning provided teachers with:** A. Opportunities to conceptualise their mediation role. B. A 'road map' - representing various levels of pupil competencies, affording a tool for: 1. **Diagnosing** the pupil's present competency level. . 2. **Estimating** the next proximal progress level. 3. **Planning** and **mediating** the appropriate scaffolding.			
	Category 4			
		Scaffolding 1	Scaffolding 2	

237

The process of guiding the teachers' metacognitive development (through the expansion of their declarative, procedural metacognitive knowledge and self-regulation) within each individual ZPD was mediated by the construction of the rubrics. This process progressed through several alternating thinking modes. The teachers' intuitive thinking found expression in creative implementation and when they reflected on their actions (Schön, 1983, 1987). Nonetheless, they applied their developed metacognitive thinking as well, which was demonstrated when monitoring and assessing their actions and knowledge (when mediating thinking skills in class). Meanings negotiation, which responded to these multi-level thinking modes, mediated the development of the teachers' conceptualisation of their mediation role. Their growing sensitivity to their pupils' levels of success or failure was ascribed by the teachers to their intensive practice with rubrics. This activity equipped the teachers with a diagnostic tool that enabled them to assess the appropriate scaffolding needed (Table 5.1).

Variability in the teachers' reliance on intuitive or rational (deliberate, metacognitive) modes of thinking when solving problems (Figure 4.3) supports recent findings from several works that studied these two thinking strategies (T Betsch, 2007). Just as individuals differ in their tendency to use intuitive or deliberate/rational strategies, some teachers benefited from the explicit presentation of the teaching strategy, while others benefitted from its flexible structure (as they could autonomously use their own judgement in applying the teaching strategy). It can also explain why several co-ordinators were wiling to engage in a deliberate assessment processes (using the developed rubrics for analysing their pupils' progress, such as Clara) while others (such as Sigal) were less inclined to engage in such systematic process, and often preferred to rely on their intuitive judgement when making pedagogical decisions.

As in other studies cited by C Betsch (2007), these two strategies were revealed to be two separate dimensions, rather than two poles of one dimension. Likewise, the teachers' metacognitive development did not exclude enactment of intuitive thinking (Figure 4.3). Moreover, environmental and personal factors influence the use of each strategy (*ibid*). Teachers in this study, who relied heavily on their

intuitive knowledge, when encouraged through the collective activity to engage in a deliberate rational/metacognitive analysis, increased their use of metacognitive thinking; as when Sigal revised the rubric under her responsibility to fit the gradual performance of the comparison skill applied in her classes. Others exhibited the use of a mix of strategies, since each strategy used was task dependent. For example (Sub-section 4.3.1.6 (b)), Tamar engaged willingly in constructing an explicit instructional plan, but preferred to rely on implicit, intuitive and non-reflective strategies when assessing her pupils' questioning skills. However, after intense learning experiences through the mentoring reflective discourse, she increased her reliance on metacognitive strategies while reflecting on her thinking processes.

This variability in the thinking strategies teachers used mirrors interconnected thinking processes suggested by studies of the intuitive practitioner (Claxton, 2000). Accordingly, teaching includes intuitive, analytical and reflective thinking as presented above. It is possible to conclude that this variability is a reflection of our brain's adaptation in an ever-changing environment (Jensen, 1998). In the classroom's dynamic environment then, the intuitive mode provided the teachers with a productive path for intensive information processing which elaborated on their accumulated knowledge (Fischbein, 1982; Claxton, 2000; T Betsch, 2007).

Vygotsky's (1962) approach to the development of higher psychological functions (such as metacognition) suggests a dialectic, interactive pattern between higher developed functions and less developed ones. Accordingly, dialectics between spontaneous concepts (such as implicit, intuitive knowledge) and scientific ones transcends both. Developing new meanings is involved in the brain activity of reorganising previous categories into new ones (Edelman, 1992, in Sacks, 1999).

The adjustment of thinking strategies to environmental and personal factors mirrors aspects of adaptability which are lacking in many metacognitive intervention programmes (Lin, Schwartz and Hatano, 2005). Providing teachers with the freedom to use their own judgement and adapt the teaching strategy tools to their teaching context led to an increased sense of autonomy and ownership over the

developed tools. This contributed to their growing sense of empowerment (Short and Rinehart, 1992). Lin, Schwartz and Hatano (2005), indicate the need for such an adaptive approach to metacognition, as it supports the teachers' general abilities in a way whereby they can simultaneously cope with many interacting factors in the classroom. Whilst conventional metacognitive interventions handle a relatively stable environment with a well-defined problem of limited duration (*ibid*), this study, executed in a real-time learning situation, provides support for this adaptive approach.

Construction and application of skills rubrics mediated various thinking processes within each teacher's ZPD. This enhanced their self-regulation and sense of efficacy (Bandura, 1986). For example, knowledge of standards performance, which they explicitly defined through the collaboratively constructed rubrics, fostered a knowledge of the aims, level of performance and efforts needed when mediating the chosen skill. In the light of explicit performance criteria, teachers were able to judge and monitor their performances and those of their pupils as well as their collectively-structured mediation plans. Thus, teachers strengthened their perceptions of self efficacy as they developed their ability to effectively regulate their mediation skills (*ibid*). As a result, they freed themselves from dependence on the feedback of others, which might be based on ill-defined criteria, by which they were previously judged (*ibid)*. This relationship between cultural mediation (through the rubric tool) and the development of the teachers' sense of self-efficacy found expression in the teachers' expressions of pride, satisfaction and control over their practice (Boekaerts, Pintrich and Zeidner, 2000).

Moreover, towards the end of this study, teachers who developed levels of self-regulation acknowledged that what is now clear to them might be questioned later on. They predicted that another challenging barrier to their pupil's development would be the next trigger in their continuous engagement in learning. This attitude demonstrated the teachers' higher levels of self-efficacy – due to their increased ability, they were able to anticipate new challenges and gain confidence in managing them (Bandura, 1986).

5.2.3 Fostering metacognitive capabilities through emotional mediation

Accenting the emotional aspect of learning within each teacher's ZPD had a significant impact on developmental processes in this study. Mahn and John-Steiner (2002) similarly advocate the expansion of the scope of the ZPD to include the emotional aspect. They argue that the emotional aspect in Vygotsky's notion of the ZPD has not yet received the same attention as have cognitive, social and cultural aspects.

The negotiation of word meanings in this study, which focused on the teachers' personal meanings of concepts in relation to professional, scientific ones (Vygotsky, 1962), is perceived by Mahn and John-Steiner (2002) as another channel for emotional support which express caring relationships and sustains cooperative understanding. These relationships provide collaborators with confidence, which can explain the teachers' trust in the mentoring process. Mutual, careful listening and respect that accompanied the mentoring reflective discourse expressed facets of emotional mediation in this study.

The understanding of the impact of the MM's emotional mediation on the teachers' metacognitive development is further supported by neuroscience studies (e.g. Goleman, 1995; Jensen, 1998). Goleman (1995, p. 31), in reference to Damasio's argument, points at the impact of feelings on directing rational decision-making and mediating our reaction, be it attraction or aversion. Furthermore, anxiety, anger and stress are presented as major factors that sabotage learning (*ibid*). These findings are particularly meaningful as this thesis's declared goal was to mediate teacher empowerment as a response to the emotional damage that current educational reforms are generating all over the globe (Levin, 1998; Ball, 2003; Dinham and Scott, 2004; Finlay et al., 2007; Brady, 2008). Anxiety and stress caused by fierce competition within and among schools with reference to raising school achievement

(*ibid*), as well as pressure and guilt (Hargreaves, 1994, 2002), were similarly experienced by teachers in this study.

Considering this background, the findings of this study are significant. Emotional support was indicated by teachers as another central element in their continual engagement in the learning processes. It is reasonable then to assume that emotional support enabled several barriers to be overcome which are involved in metacognitive learning and teaching. According to Kayashima, Inaba and Mizoguchi, 2004), metacognitive thinking involves effortful processes of the brain's working memory. Anxiety or other feelings causing stress can interfere in the enactment of rational thinking and of decision-making processes (Goleman, 1995). These interactions are explained by the interconnectedness between the brain working memory and the emotional system, which studies have proven create neural static due to signals of stress (*ibid).*

5.2.4   The generating potential of language as a methodological tool

Language as a macro-cultural factor (Ratner, 2007) was utilised in this study as one of school's most generative resources (generating new conceptualisation). Drawing on socio-cultural perspectives (Vygotsky, 1962; Mercer, 1995; Wells, 2000), language does not mirror a separate given reality but serves as a vehicle for social coordination and adaptation (Bredo, 1999). However language is often taken for granted (Schutz, 1970) and much educational practice ignores its active role in knowledge construction (e.g. Bredo, 1999). Though, as Wells (2000) indicates, there has recently been an increased recognition of its central role in learning and teaching of all subjects, others scholars point at the greater efforts that are needed in making such awareness part of teacher knowledge, either in science education (Yore, 2001) or in the teaching of languages (Andrews, 2003).

The findings of this study support the existence of this state of affairs. Surprisingly, the teachers' lack of awareness of the role of language as an instrument for

developing thinking included the language teachers (Hebrew as well as English). The effect of the mentoring reflective discourse, then, was essential for raising their awareness.

The intentional use of language for enhancing teacher empowerment realised its potential as 'the tool of the tools', as coined by Dewey (Vygotsky, 2004, p 83). It was demonstrated to be a multifunctional methodological tool that fostered the teachers' metacognitive development. It mediated the mentoring discourse and its analysis through workshops, interviews, the teaching strategy, observations and other activities and products involved in the school curriculum (Chapter 3).

Mercer (1995) stresses that a major difficulty in entering into any field of knowledge is the need to become familiar with new technical terms. While Mercer emphasizes student problems with 'difficult words' (*ibid*: 35), in this study, meaning negotiation through the mentoring discourse was directed at assisting teachers who found it difficult to cope with the new jargon of the teaching strategy and that of the education milieu.

5.3 The impact of the MM on Organisational Empowerment

The different perspectives discussed thus far show that teacher empowerment does not evolve in a vacuum; it needs a discourse (Sub-section 4.3.1.4) through which to help teachers overcome barriers to the development of their metacognitive knowledge, which related to a lack of relevant vocabulary.

The next sub-section will discuss the first of two secondary questions of the research:

> What impact does the mentoring model have on the empowerment of the organisation?

Since the social environment mediates thinking and behaviour, it was important to engage in organisational development in order to sustain teacher empowerment.

The aim of this sub-section is to highlight interacting patterns between teachers and the school organisation that foster such empowerment, where teachers as self-regulated learners with enhanced sense of self-efficacy and satisfaction mediate thinking processes. Findings and initial discussions (Sub-section 4.3.2) with reference to the promotion of characteristics of a learning organisation (Senge, 1990), indicated developmental processes in the school environment that parallel teacher empowerment. In the following discussion, the findings will be used to highlight the impact of the MM on reciprocal multi-level interactions which lead to teacher empowerment. Senge's (*ibid*) five disciplines of system thinking, mental models, personal mastery, team work and shared vision will be presented through their interaction with each other along with other theoretical perspective that guided this thesis (Figure 2.1). This approach helped in understanding the complexity involved in generative developmental processes that yielded teacher empowerment in this study.

5.3.1 The construction of a coherent discourse through multilevel instrumentation

The development of a school meta-language for enhancing pupil thinking skills (as the school's activity main goal) was structured in a productive mentoring programme with multilevel frameworks through which shared meanings could be practised. Interdisciplinary learning interactions helped remove the rigid existing boundaries that inhibit inquiry and avoid seeing important interactions in the organisation (Senge, 1990). Engeström (1987, 1999) similarly views boundary crossing as an aspect of an expansive learning process. Shared meaning, in return,

creates a coherent discourse, which directs communal efforts towards reaching collective objectives (Vygotsky, 1962).

Atkinson, L. (2000) points out that when the learning environment lacks a structural basis, individuals fail to develop trust in their own judgment, '… as feedback is constantly changing and adjusting the general direction of judgment with a frequency that is hard to cope with (*ibid*: 58)'. A lack of a familiar vocabulary or changing slogans (Bynom, 2003) creates inconsistency (e.g. as teachers are seldom told of 'a new right way' for teaching). As a result, inconsistency impairs conception of a clear direction and assertiveness (Atkinson, L 2000). This explains the positive impact the MM's longitude research design on structuring a consistent environment. Three years provided teachers with sufficient opportunity to engage in learning sequential learning cycles, through which they were able to test the effectiveness of their newly developed perspectives. Seeing this development through its dynamic history (Vygotsky, 1962) enabled the teachers to see a whole process rather than separated parts from which they usually cannot see the results of their previous solutions (Senge, 1990).

At the same time, when the MM integrated the educational system's vocabulary as used by administrators and policy makers' discourse into its programme (e.g. 'learning organisation', 'empowerment', development of 'higher order thinking skills'), it enhanced the coherency of the school environment. When the direction was clear, it supported the teachers' trust in their own judgement and enhanced their sense of self-efficacy (Bandura, 1986).

5.3.2   Generating innovations - cultural, social, cognitive and emotionally-mediated processes

Rubrics construction was one of the central tools which fostered teachers' conceptualisation (Table 5.1), and in turn explains the teachers' enhanced systems

thinking. As a conceptual strategy, systems thinking aims at organising a complex reality into a coherent whole (Senge, 1990). The teachers' developed conceptualisation provided them with new perspectives, as indicated through the emergence of new patterns of teaching-learning interaction (e.g. Sub-section 4.3.2.1). According to Weinberg (2001), these represent the formation of a new relationship between the teachers as observers and the system as the learning activity.

Senge (1990) accents the essential role of systems thinking, as guiding principles that leverage actions. Several methods of mediation in this study had an impact on such development. I will use the impact of the rubric, since cross-analysis indicated its role as a central leveraging tool (Fig 4.5) for mediating innovations in the collective activity system (Engeström, 1987, 1999). It triggered multi-level interactions which enabled teacher metacognitive development (e.g. Sub-sections 4.3.1.2 and 4.3.1.5).

The findings receive insightful perspectives when drawing on Engeström's (*ibid*) model for analysing the rubric's role in leveraging learning and developmental processes in the organisation. His model of expansive learning highlights the interactive dynamic through which rubrics turned out to be an innovative tool. Accordingly, borrowing an instrument such as the rubric from one context to a new one in order to solve a new dilemma is an inventive act. The rubric as an educational artefact was similarly borrowed from the context of the formative assessment field (Black et al., 2004) and use in an innovative way as a cultural tool in teaching, learning and assessment processes. Its new use triggered change in the whole activity system, which Engeström (*ibid*) ascribes to the dynamic of an expansive learning cycle; innovation starts as a simple idea and is transformed into a complex object which generates a new form of practice. Likewise, the use of the rubrics as part of the teaching strategy progressed gradually from the experiential stage of their construction by the teachers to their use in classes, and later for constructing the school curriculum and even further on to its use in a new activity context (crossing boundaries).

Moreover, the visual structure of rubrics and their use as disseminators of knowledge in the organisation enabled circles of influence to be seen, which enhanced teachers' system thinking; whereby the mediation of pupil thinking skills, which guided by the skills rubric criteria, yielded in return feedback from pupils as well as other teams which informed them of their effective actions. At the same time, the perception of circles of influence contributed to the recognition that their previous solutions where part of the problem (Senge, 1990) when they were not able to see the whole process of thinking skills instruction in school.

The conceptualisation that developed among the teachers (the subject co-ordinators in particular) affected their instructional behaviour. A shift in reactions to their pupils' difficulties demonstrated the development of self-regulation and new perspectives among them. Immediate frustration, or their interpretation that the pupils are weak, was transformed into mediated reactions. The teachers' new perspectives (Sub-section 4.3.1.2), due to their developed competency to diagnose learning difficulties, changed their reactions, and led them to further inquire into the pupils' difficulties or the use of the strategy. This shift of attitude, according to Senge (1990), indicates the development of a learning culture in the organisation.

Paris and Winograd (2001), in reference to recent studies, maintain that teacher understanding of the cognitive, motivational, and situational characteristics of learning can help them design better instruction. Evidence of such growth was indicated through the teachers' engagement with formative assessment processes (Black et al, 2004), claiming that diagnosing pupils' was like entering the 'pupils' mind' (e.g. Tamar, Sub-section 4.3.1.6 (d)). Vygotsky (2004) uses the x-ray analogy for describing this kind of psychological analysis of the learner's intellectual developmental processes in its inward direction.

Knowledge of standards performance, which teachers explicitly defined through the collaboratively-constructed rubrics, fostered knowledge of aims, levels of performance and efforts needed when mediating the chosen skill. This process

made a difference in teacher knowledge (Bateson, 1972), as when the activity was adjusted to their ZPD they were able to engage with new information (concepts) and appropriate them to their own practice.

Findings which indicated the development of a reflective openness (Senge, 1990), through team learning interactions, are significant. As school rewards us when having the right answer, or trains us to 'never admit that we not know it' (Senge, 1990, p 25), teachers who hold these beliefs often experience negative feelings such as confusion, uncertainty and being at a loss (Schön, 1988). It is possible to assume that barriers to reflective teaching were successfully challenged in this study as trust among collaborators developed. In addition, to the extent that reflectivity was highly valued, engagement in sequential reflective cycles towards higher levels of self-regulation was encouraged (Boekaerts, Pintrich and Zeidner, 2000).

Though the findings demonstrated the generative impact of the mentoring reflective discourse on the teachers' metacognitive development (Sub-section 4.3.1.5), constraints imposed by school's day-to-day demands did not allow all participants to equally share this essential experience. Previous studies also accent the lack of opportunities for teachers to practice the role of a reflective practitioner (e.g. Gilliss, 1988; Peters, 2004). Peters (2004) reports on several action research studies, including hers, which indicate difficulties in learning and sustaining action research due to its 'complexity and lack of congruence with the hectic nature of life in classrooms' (*ibid*: 545).

Setting the mentoring programme in the form of a collective activity, with unified purposes and concerted efforts, is viewed by Bandura (1986) as a source for collective efficacy which is rooted in self-efficacy. These reciprocal aspects can explain parallel developmental processes that characterise a learning organisation as stated by Senge (1990:4): 'where an organisation that will truly excel in the future will be an organisation that discovers how to tap people's commitment and capacity to learn at *all* levels…'

5.3.3 Power and empowerment in the learning organisation

Fostering the teachers' metacognitive development enabled them to collaboratively construct a school curriculum with a thinking skills core based on national standards. Doing that through negotiation processes was found empowering in this study (particularly by the Hebrew staff). This finding is particularly significant in light of the tension between centrally-imposed standards and local innovation (Ball, 2003; Finlay et al., 2007). The use of their developed instructional tools provided teachers the sense of control over t heir practice without control over their pupils. In fact, it was Dewey (1916) who back in the beginning of last century warned of the distractive effect of imposed acts that show distrust of teacher experience. The teachers' developed sense of self-efficacy on the other hand was thus rewarding, as it fostered their pupils' confidence too (*ibid*).

Such empowerment can explain change in the teacher-pupil participant structure; dialogical relationship with their pupils were fostered as teachers in a state of reflective openness (Senge, 1990) were more open to share their thinking as well as being influenced by others. Expressions of willingness to continuously improve their practice expressed personal mastery and commitment to their personal growth.

Innovative processes would have not proceeded without the leadership of the Head-teacher. The findings demonstrated his full commitment and engagement in the collective goal. Provided with tools for curriculum planning through the mentoring programme widened his systems thinking to see the complexity involved in a programme he cherished. His complete commitment to the development of a school meta-language and increased openness to share leadership and engage personally in expansive cycles of learning constituted a powerful model for others. Nevertheless, as indicated in the findings, there was a gap between his vision and the design of learning processes for which his charismatic leadership was proved to be insufficient.

Senge (1990) highlights this point, claiming that the new view of leadership in a learning organisation requires mentoring skills that help others learn. The Head-Teacher's growing openness, his understanding of the gap in his mentoring skills and his complete trust in the mentor's confidentiality and professional competency, allowed me to join the school leadership.

The section below will discuss the next secondary question of the research:

> What impact does the mentoring model have on the empowerment of the mentor?

5.4 Impact of the Mentoring Model on Mentor Empowerment

Preliminary discussion relating to the impact of the MM on the mentor's empowerment revealed reciprocal and parallel developmental processes between the teachers, the organisation and the mentor. This section will focus on conceptualising the mentor's empowerment, accenting dialectics between theoretical and methodological perspectives. The aim is to highlight additional aspects through which to understand the impact of the MM on mentor empowerment and the relationship between such growth and teacher empowerment.

5.4.1 Mentor empowerment – developing a sense of self-efficacy through the dialectic between theory and practice

Applying a methodology of self-study as well as action research as part of the MM's action plan (Chapter 3) was found to be generative through intensive dialectics applied in both practice and theory. My growing conceptualization was essential as it afforded teachers with an agent, enriching their cultural environment, by the use of productive cultural artefacts (such as rubrics, methodologies, and plan tables). Three discourse channels served as scaffolding for my growing conceptualisation:

a.   <u>A mentoring reflective discourse, which</u> took place through a dialogue with teachers and discourse analysis. It served to refine and crystallize meanings in reference to skills mediation, where collaborators regulate each other's behaviour.

b.   <u>A dialectic within various theoretical perspectives</u> and a wide scope of research findings, related to learning processes. This dialectic helped me understand the multidimensional process involved in mediating teacher learning.

c.   <u>A self reflective process</u> allowed cross analysis of information from these two channels and my own theoretical framework throughout the research. This context enriched my repertoire ('tool kit'), as it yielded the construction of several analytical tools for diagnosing the progress of each teacher within his or her individual ZPD (e.g. Table 3.2; teachers' constructs)...

Equipped with new cultural tools and with my growing competency, I was able to provide the teachers with additional scaffoldings. Together with my intensive reading of the literature throughout this thesis, a dense web of concepts was generated (Figure 5.2). Synthesising the various concepts helped me to conceptualise teacher empowerment as both a process and as a construct embedded in the development of the teachers' self-regulation and sense of efficacy. Engeström (1999) similarly claims that a dense mediational setting fosters the generation of a new mentality.
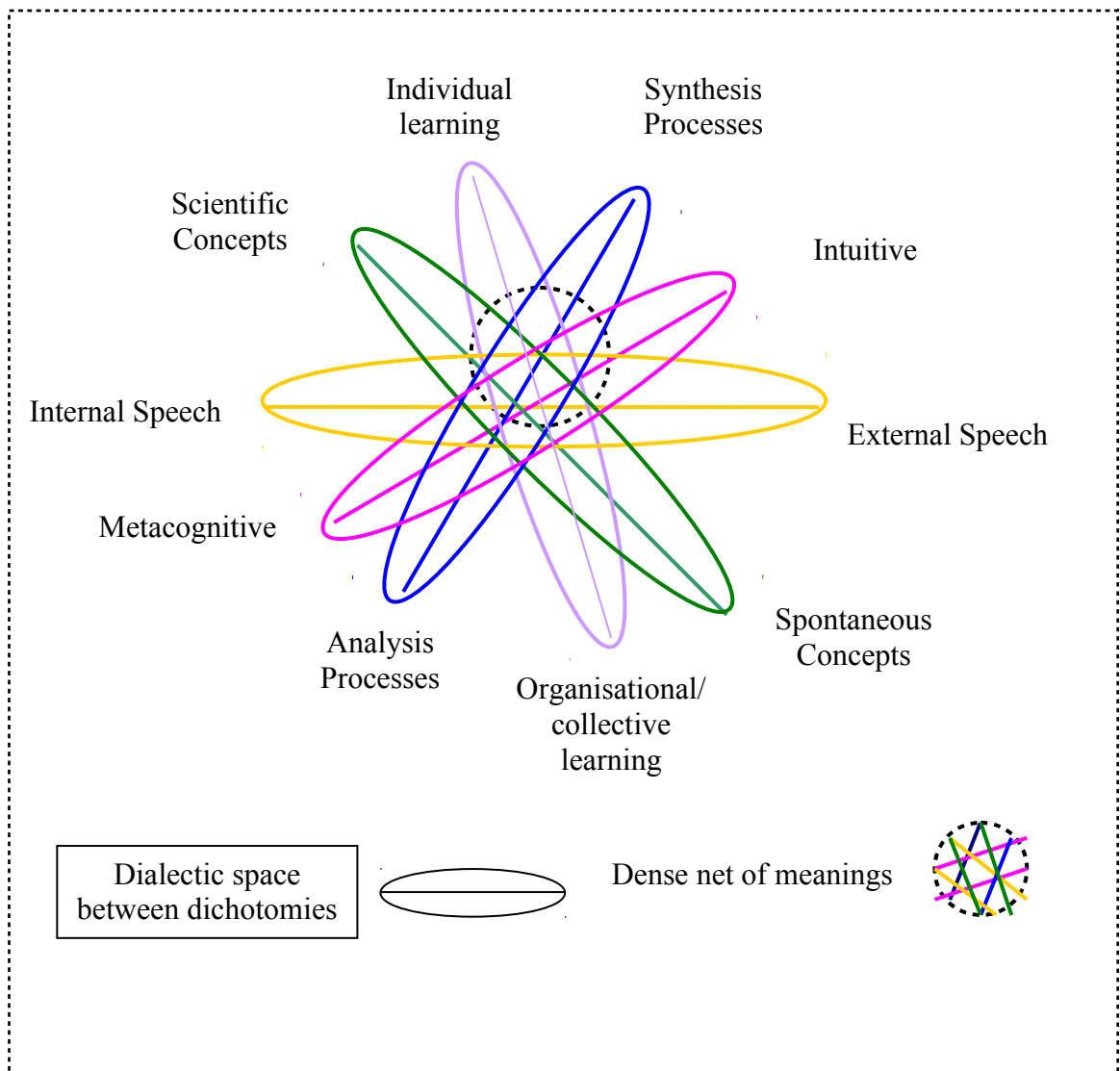
Figure 5.2: Conceptualisation –- creating a dense net of meanings

Dialectic between the different theories and the research findings led to a synthesis of the theoretical perspectives of this thesis (Figure 2.1) which avoided the dichotomies between theory and practice (Vygotsky, 1962). In addition my growing new insights fostered my sense of self-efficacy (Bandura, 1986). Receiving continuous positive feedback from the work of important theoreticians and studies in the academic milieu was as valuable as the professional acceptance that the teachers received from their colleagues (Section 5.1). Awareness of the impact and generative effect of my intuitive decisions as a mentor/researcher (Atkinson and Claxton, 2000; Engeström, 1999) helped me develop trust in my own judgement (Atkinson, L, 2000). Moreover, positive feedback from the teachers served as an additional social support which fostered confidence in my ability to

challenge the different constraints that affected this study (e.g. Sub-section 4.3.1.4). Mentor development was thus essential for teacher empowerment. As Vygotsky states (1962, p 104.): 'The only good kind of instruction [/mentoring] is that which marches ahead of development and leads it.'

Reading through neuroscience studies was particularly exhilarating for me, as I received reinforcement for different decisions that I had made as a guide of the school's mentoring programme. Intuition led me to believe that generative meaningful learning was taking place when I detected a 'sparkle' (Sub-section 1.1.2) in the eyes of a student or mentee. Drawing on brain studies, this expression can be connected to feelings of 'flow' when new consciousness evolves through the process of making new meanings (Edelman, 1992, in Sacks, 1995). Moreover, at this stage, we function optimally, effortlessly, as we integrate and orchestrate our stream of consciousness (*ibid*). Thus, I felt excitement and exhilaration at the stage when, together with my collaborators, I perceived that the key to the problem had been found (Engeström, 1999) (e.g. Sub-section 4.3.1.4).

Furthermore, when learning processes were conducted in a safe climate and teachers were engaged in supportive learning interactions, they apparently experienced emotionally-felt meanings, a sense of satisfaction and pleasure (Jensen, 1998). It was this feeling that I attempted at the beginning of this study to arouse in teachers, though I did not explicitly understand its mechanism. Drawing on brain studies, this feeling is ascribed to dopamine activity, a neurotransmitter which is involved in the brain's reward system (Jensen, 1998; Howard, 2000; Stokes, 2004) and in addictive activities. Thus, it is possible to infer that, just as dopamine facilitates pleasurable sensations of confidence, exhilaration and euphoria when experiencing meaningful learning (Howard, 2000; Stokes, 2004), it is also involved in addiction to learning activity. This can explain my urge to engage in generative, expansive cycles, which guided my intention to engage teachers in such exciting collaborative moments. Senge (1990) similarly accents these communal experiences as ones we relish for many years. Sensing such excitement and exhilaration by teachers increased my satisfaction, especially when many of the co-ordinators shared those feelings with me. When some expressed their

addiction/devotion to learning as being 'caught by the bug' (as for example Clara, see Sub-section 4.3.1.2), a particular sense of self-efficacy was aroused in me. It strengthened my trust in my intuitive judgement (Atkinson, L, 2000), whereby the engagement of teachers in a shared collective activity would be rewarding and would engage them in further on-going expansive learning cycles (Kolb, 1984; Engeström, 1999).

Developing my competencies and self-efficacy as a mentor led to the crystallisation of this MM, which can be characterised as developmental (Clutterbuck, 2004). Since mentoring derived from the holistic approach of this thesis to teacher empowerment, it included a unique set of characteristics ascribed to supporting roles; mentoring and coaching as ascribed by Clutterbuck (*ibid),* teaching (telling, giving instruction, tutoring), as well as mediation of meanings negotiation within individuals and multiple ZPDs in the school organisation (which emphasised the emotional, cognitive, social and cultural aspects of learning). The MM's successful impact on enhancing teacher self-regulation was empowering for me, since engaging the teaching staff in meaningful learning processes was my main goal in this study. I gained satisfaction in particular as the model's reference to cognitive, emotional, social and cultural mediation (e.g. Sub-section 4.2.5) was later projected on teacher-pupil learning interactions. This projection demonstrated the modelling impact of the mentoring relationships on teacher development. Modelling dialogical relationships and reflective practice is essential, since it is only through the medium of an interaction with the teacher that the mentor affects the teacher's interaction with her pupils (Schön, 1988) and the coping with barriers involved in metacognitive practice.

Emotional mediation (Sub-section 4.3.1.4) enhanced the teachers' confidence in their ability to construct their new ideas and reflect openly (Senge, 1990) on their strengths and weaknesses. Awareness of the impact of the mentoring caring relationship on the teachers' increased strength to reflect on their actions in a way that defensiveness became less likely (Schön, 1988) enhanced my sense of efficacy. The teachers' preference for caring relationships are similarly expressed in Clutterbuck's (2005) findings, where mentees expressed an aversion to mentors who

talk at them rather than with them. Teacher trust in the mentoring process can be ascribed to the mutual, careful listening and respect that took place throughout the mentoring reflective discourse. Revans' notion (1982, in Hacohen and Zimran, 1999) of empowering learning processes lends support to the MM's reciprocal relationships; where neither mentor nor the teachers possess the answer to the inquired problem.

As the mentor and the teachers in this study exercised their intuitive thinking, risks were reciprocally shared and teachers indicated their willingness to continuously engage in improving their practice. In addition, when knowledge was collectively generated and shared through the mentoring process, it led to a sense of ownership among the teachers over their developed practice. My sense of efficacy, on the other hand, was nurtured as teachers ascribed their commitment to engage in further demanding learning processes to the reciprocal mentoring relationship (Sub-section 4.3.1.4). Tapping the teachers' commitment to continuous learning enhanced the organisation's learning culture (Senge, 1990) and demonstrated that I was able to mentor empowering developmental processes in school.

Chapter 6   Conclusions

One of the central meanings I gained from this thesis as a mentor and practitioner researcher is that hope abounds for teacher empowerment as professionals, and it is within reach.   In this section, I will briefly highlight central characteristics of the MM which had an impact on the development of teacher empowerment. Following, I will outline the contribution of this thesis in filling the gap in knowledge of ways that teachers can be supported and empowered as self-regulated learners.   Since teacher empowerment was shown in this thesis to encompass characteristics of a socially-mediated developmental process, the empowerment of the organisation and the mentor will be referenced in this section.

6.1 The Mentoring Model - An Innovative Approach to Mentoring Teacher Empowerment

Engaging the school in learning cycles through a school-wide mentoring programme was found to be a promising approach for furthering teacher empowerment. The complex learning dynamic led by the MM is embedded in its holistic approach to teacher developmental processes. Such a multidimensional model is strongly recommended as a form of professional development programme (e.g. Guskey, 2000), especially when it addresses the school needs (Keedy et al, 1999).   The focus on the micro level – enhancing teacher metacognitive development, and on the macro level – through the construction of a school curriculum with a thinking skills core, was demonstrated to be a useful springboard for such engagement. The integration of various theoretical lenses, where socio-cultural perspectives (e.g. Vygotsky, 1962, 1978; Engeström, 1987, 1999) served as an overarching framework, generated an innovative, powerful multi-dimensional mentoring methodology that fostered teacher empowerment:

- The MM paved the way for a joint journey where the mentor engaged the school's teachers and management in the development of a shared

vision and systemic approach (Senge, 1990) for enhancing a metacognitive pedagogy .

- Incorporating the MM as part of the school collective activity (Engeström, 1987, 1999) defined the system under study (Weinberg, 2001) and thus enabled interacting patterns to be observed. These mirrored expansive modes of learning (Engeström, 1999) as teacher and mentor growth developed at various turning points, struggled with contradictions and dilemmas, and created excitement when the key to their problems was found.

- Mentoring learning interactions within multiple ZPDs in the school organisation led to the development of the MM's rich methodology. This methodology provided a fertile mediating environment (relating to cognitive, emotional, social and cultural aspects of learning) through which to enact multi-level interactions among the subjects of the collective activity.

- Language, when intentionally used as a cultural factor for enhancing coherent discourse, is a highly effective resource for fostering self-regulation and self-efficacy. The study provides a practical model through which to exploit language as a macro-cultural factor (Vygotsky, 1962; Wells, 2000; Ratner, 2007) in order to mediate metacognitive development. The mentored collective discourse provided useful background for explaining how empowering it is when teachers/mentor question the taken-for-granted (Schutz, 1970) and construct new perspectives through intensive negotiations of word meanings.

- Innovations were the product of mentored multi-level interactions involved in the construction of a school curriculum with thinking skills core. As teachers and mentor developed an adaptive orientation to developmental processes, the mediating tools were continuously transformed. Teachers adjusted rubrics and modules to fit pupil learning, each within his or her own individual ZPD, and the mentor adjusted the mentoring methodology for enhancing and assessing the teachers' metacognitive growth. These interactions yielded an

empowering process, where characteristics of self-regulation (Pintrich, 2000) and self-efficacy (Bandura, 1986) enhanced teacher empowerment.

- Engaging intuitive and metacognitive modes of thinking was demonstrated to be a productive approach for enhancing trust in the practitioners' own judgement (both teachers and mentor). This orientation fostered teacher control over mediation processes in class. Similarly, it afforded the mentor the confidence to lead innovations in the school (manifested in the innovative use of rubrics for constructing and assessing teacher progress, as well as a disseminator of knowledge in the school organisation). In addition, the bootstrap dynamic, where intuitive and metacognitive mental functions interacted and transcended self-regulation and a sense of self-efficacy, was found to be appropriate for coping with the school's complex dynamic environment.

It can be concluded that, as proactive learners, the teachers and mentor demonstrated the ability and the sense of self-efficacy needed to control behaviour when making choices. Being free to make pedagogical choices, an expression of teacher autonomy and characteristic of their empowerment (Short and Rinehart, 1992; Zenz, 2000), correlates with the development of their mediation skills and a rich repertoire of tools from which to make choices.

Since teacher empowerment was embedded in a system of collective activity, reference in the next section to the contribution of this thesis to knowledge will address both the level of the organisation and that of the mentor.

6.2 Contribution of this thesis toward filling the gap in knowledge aimed at fostering teacher empowerment

6.2.1 The teachers' level

The research findings are particularly valuable considering the difficulties that teachers encounter when learning and mediating metacognitive pedagogy (Leat and Lin, 2003; Zohar, 2006 Harpaz, 2006). The MM provides a flexible environment with an adaptive approach to learning which responds to the teachers' need to experience self-regulation when mediating thinking skills. Mediating teacher metacognitive development that involves complex thinking strategies (intuitive and metacognitive) offers a way to fill in the gap between current professional development programmes, which Fullan (2007, p 36) views as a `packaged prescription`, and the teachers' need for professional learning that will enable them to cope with challenges in their own workplace. Challenging such complexity is counter to the hyper-rational approach of leading educational reforms, which reflect a fear of these complex dynamics and a constant search for authoritative solutions (Eraut, 2000).

The MM provides a methodology whereby intensive metacognitive discourse enhances metacognition (Pintrich, 2000; Paris and Winograd, 2001) through which collaborators in meaning negotiation regulate each other's understanding and behaviour and convert implicit knowledge of mediating thinking skills into explicit ones. Fostering teacher metacognitive knowledge and skills assumes to have particular value for literacy teachers, as their implicit knowledge does not enable them to intervene beyond the level of sentence construction or word choice (Johnson, 2000). Since self-regulation does not follow a simple plan of action and learners need to develop adaptive skills when coping with changing conditions (Paris and Winograd, 2001; Lin, Schwartz and Hatano, 2005), the MM's contribution to fostering teacher metacognition is assumed to be significant.

Moreover, the neglect of explicit reference to the emotional aspect of teacher learning (Hammersley, 1999; Mahn, and John-Steiner, 2002; Ball, 2003; Ratner, 2007) is addressed in this study through the provision of emotional mediation within each teacher's ZPD. Various elements in the MM serve to develop teacher confidence which encourage them to cope with the risks inherent in new and challenging learning. The study shows that the teachers' anxiety, sense of insecurity or guilt decreased when they were provided with opportunities to develop trust in their own judgement, and a sense of self-efficacy (Bandura, 1986; Atkinson, 2000) when mediating thinking skills.

6.2.2 The level of the organisation

The research methodology provides a clear and usable path for practice which responds to the gap pointed out by Eraut (2008); between attractive ideologies, embedded in the concept of the learning organisation and communities of practice, and the lack of explicit practices which address the power and micro-politics in organisations. Moreover, this thesis offers a way through which to answer the question raised by Eraut (*ibid)* as to the ways by which we can indicate that a particular organisation is a learning organisation. In addition, providing a model that demonstrates engagement, where the teachers' and the educational system's visions merge, was shown to be beneficial in empowering the mentor, the teachers and the school as a learning organisation (Senge, 1990; Lichtenstein, McLang and Knudsen, 1992). Thus, the MM illustrates the meaning of empowerment as a synthesis between the development of the individual (teacher, mentor) and that of the organisation, rather than reducing it solely to growth of the individual (Page and Czuba, 1999).

In addition, such an environment served as a base for modelling mentoring skills. The mentor in this study, as one of the school's collective activity leaders, provided the school leadership with an opportunity to observe mentoring skills; as designing a learning environment and mediating learning processes within teachers' ZPD. Since helping others learn requires new perspectives of leadership in a learning organisation (Senge, 1990, Evans, 2007), the present MM contributes an innovative

approach which translates caring relationships into practical mentoring skills that empower teachers as self-regulated learners.

6.2.3   The level of the mentor

The MM offers an effective multidimensional approach which can fill the gap (as indicated by Rubinstein's comprehensive study (1999)) between the mentor's perception of appropriate goals for enhancing teacher professional development and those perceived by the educational system.   Presenting the MM through its evolution provides different paths through which educators as teachers and mentors can engage as practitioners in constructing new knowledge.   Providing a model that demonstrates communal engagement, where the teachers' and the educational system's visions coincide, was shown to be beneficial in empowering the mentor, the teachers and the school as a learning organisation (Senge, 1990).   Shared visions and teaching goals replaced the school staff's common perception that the ideas of external experts (such as school mentors) are irrelevant to school needs (Arieli and Shachor, 2003) and that new educational reforms are just so many meaningless slogans (Page and Czuba, 1999; Bynom, 2003). The way by which the trust of the teachers and management was gained in leading school activity demonstrates that the MM is a productive approach for coping with the challenging constraints with which mentors are faced (Rubinstein, 1999; Arieli and Shachor, 2003; Orland-Barak, 2004).

The mentor's dialectic in this thesis with several theoretical perspectives, which yielded a rich methodology for mediating and interpreting the teachers' metacognitive development, provides a way to recruit powerful theoretical concepts toward practical ends.   Considering the fact that research rarely provides teachers with specific actions or behaviour that can be put into practice (e.g. Fullan, 1995, in Leat and Lin, 2003), this thesis assumes to narrow this gap between theory and practice.   Dialectic enhanced the mentor's systematic thinking and trust in her own judgment.   It also responded to the need for an integration of theoretical approaches that can help practitioners cope with educational change (e.g. Desforges, 2001, Claxton, 2008).

6.3 Limitations of this study

This study was undertaken with a qualitative approach. Thus, it is difficult to generalize the findings. It is limited to one junior high-school in northern Israel. The school was chosen because I was appointed to be its mentor, and not by random selection.

The teachers' day-to-day involvement with teaching and the hectic nature of their work limited their ability to engage in an inquiry process through dialectic with the professional literature and a direct assessment of the findings. It is assumed that more involvement in the inquiry process would have contributed additional perspectives to the issue under investigation. On the other hand, providing teachers with a reflective multidimensional environment through which they personally inquired into their own practices served to counter some of these limiting factors.

In addition, while the schedule of the focus groups (10 participants, co-ordinators and management staff) allowed essential discourse interactions with the school leadership, intense mentoring with other teachers would be assumed to have additional input on the research findings.

Nonetheless, the interpretation of data through various theoretical prisms and comparison with similar findings in the professional literature are assumed to contribute to the general applicability of the research findings. In addition, Lemke (1998) argues that, while we cannot generalise from discourse analysis, its power is in the tools it provides for analysis and understanding. Since gaining meaning and further understanding was one of the research goals, its limitations are also its strength.

6.4 Recommendation for further research

This study was undertaken in one junior high school, with the goal of gaining an understanding of teacher developmental processes that lead to their empowerment in the workplace. Efforts should be made in future studies to apply the MM in other schools and thus further validate the research findings. In addition, it would be interesting to explore the MM's impact on elementary or high school teachers as well.

Widening the scope in future research to include classroom observations can contribute to understanding the dynamic of teacher metacognitive development. Such data can also validate the teachers' assessments of their pupils' development and increased competencies. In addition, observation and further dialectic with brain studies can clarify the dynamic involved in enacting intuitive and metacognitive modes of thinking when mediating thinking skills.

Widening the discourse space in future studies to include other channels of communication such as the Internet (exposing and distributing school knowledge such as curriculum, rubrics and teaching modules) can help further explore the impact of organisational empowerment on teacher metacognitive development.

Appendices

Appendix 1   Personal Journal
Selections from my reflections, December 2001

<u>Frustrations and constraints</u>

Bitter disappointment, the frustrating pain of having missed something in my mentoring. It is deep and very painful. I ask myself whether I acted correctly by becoming more flexible; I moved from the original plan in favour of the needs of the system in which I mentor. Risk-taking is involved here. Have I clarified this sufficiently to my partners (the teachers, the coordinator, the Head-teacher)?

And what will happen if they don't even allow me to suggest alternatives? (I can identify here traces of my reactive language). I could suggest an alternative way to work with other staffs. This is a tightrope walk; it includes the risk of falling. The fall is after all that of the 'acrobat' (the school mentor), but will the maintenance staff in the arena also take responsibility? (School's participants). Perhaps if they were part of the work contract they would enlist greater efforts to check the ropes …

Perhaps I have not shared things with them sufficiently? Perhaps I threatened them in some way, or did not identify the obstructive power centres that should be enlisted for the benefit of the task?

At each stage, when there was a point for feedback and assessment occurred, and especially when the partners were alerted by an emergency call (by the Head-teacher), the feedback led to defensiveness, anxiety.

The case in which B the Head-teacher already laid out additional goals which she didn't even notify me about. The message that I have received (by that) is that there were already new goals, while I have been instructing teachers to meet a goal she (the Head-teacher) once initiated but has already forgotten by now. How much energy can I expect to enlist among the teachers when new goals are being added all the time? As a colleague in the staff mentioned following a failed workshop: 'The teachers are exhausted after a day's work, with all the apprehension concerning dismissals; they are not accessible to put themselves in the position of the pupil (relating to experiential learning through one of the workshops). They want to be provided with prescriptions … they expect you to provide them with criteria during the workshop' (while my aim in my activation of the teachers was that they would

learn to draft criteria themselves in order to derive instructional goals). I felt a mixture of conflicting emotions: anger, disappointment, and a bit of bitterness, a sense of, I have missed something.

In contrast, I felt empathy for the frustrating and unbearable situation of the teacher's work in exhausting environmental conditions, stifling any possible growth. Have I become the punch-bag that they need to batter to release their frustrations? In fact, there is no one correct path and my most important conclusion for the future: to summarise the desired product in the most minute detail with the staff and how they wish to achieve it… show them the possibilities/ risks in failing to reach the target as their own choice! My conclusion is that to create the process of the trust-building, it is necessary to relate to each and every detail in the construction of the action outlines together with the Head-teacher and his colleagues, using a management tool that may undermine the success of the school's task.

Reflections, April 2001

Shai (a teacher that I mentor in the sane school), contacted me following my suggestion in our previous mentoring session. How wonderful it is when one of the teachers I mentor contacts me, asking for assistance. This is the dream of every teacher where the pupil wants to learn and asks questions. This is so fortifying for me. Although I already know that the programme's goal has been buried, nevertheless I have continued to mentor the teachers towards that end. I believe in it and this teacher apparently does too. This teacher 'acquired' a tool and now turns again to me to receive additional assistance in order to exploit it. This fortifies me, as if to say don't wait for the teachers to name their need, offer them the opportunity, enable them to examine their needs…to continue rowing toward professional growth even when the sea is stormy and the horizon cloudy. Not to allow the 'here and now' to paralyse us.

The following are some citations of teachers' frustrations

'More tasks that I shall have to tackle'

'**I'm worried** by the fact that **each change is dropped on the teacher from above and nobody involves me** the teacher **in how to implement it and to develop learning methods, planning and assessment'.**

'**Where is the consideration** for the change that the teacher has to undergo, where is the Ministry [of Education]?

'I'm interested to know **what will be the reward for this. Whether there is a reservoir of [teaching] hours or some sort of compensation for this? Who will lead the change?'**

'**It's all interesting** but there is a need to **see slightly more examples and not just theories**. **I lack the applicability** of things, to see what they are talking about. It seems **like hard work to me and I hope we'll see that it's accompanied by some profit**.

'I'm concerned whether the **school really believes in it** and pays sufficient attention to **the changes that must take place in the organisation'.**

'I'm interested to know **what the Ministry of Education contributes to the improvement of the school's reputation'.**

'**Specifically**, to do more joint **concrete** activation/ practice'.

'…I have so much work'

'It bothers me that it's desirable that everyone should be at the course but in practice **it would be most profitable to have a small group – intimate with a common interest'**

'It's worth sitting together brainstorming, order and organisation'.

Appendix 2   What is a Rubric?

In the professional literature the terms 'scoring rubrics', 'rubrics' or 'scoring scales' are used alternatively for the definition of this autonomic assessment tool. Scoring rubrics are among the most popular innovations in education (Goodrich, 1997). They encompass perspectives of authentic assessment which serve the purposes of learning as well as the purposes of evaluation (*ibid*).

Goodrich (1997) describes a 'rubric' as a scoring tool. It lists the criteria for a performance task, and also articulates gradations of quality for each criterion, from mastery to low levels of performance. Each specified quality level serves as an indicator of achievement, suggesting the order of preferences in assessment.   In holistic rubrics, it is the overall quality of performance that is considered.   In contrast, an analytic rubric, as employed in this study, articulates gradations of quality performance for each dimension (group of criteria, category) separately.

Rubrics began to be incorporated within the learning programmes of the Israeli Ministry of Education, emphasising a policy of programmes' assessment directed to standards in 2001 (http://cms.education.gov.il/NR/rdonlyres/B8B6C46B-36AA-497A-9FE7-4F34D8E7FE2A/54135/Performance4.doc).   I found that they were a remarkable tool that could be used naturally to connect the education system assessment goals with those of the present research. The intention was to guide the teachers' innovation in an area that combined teaching, learning and assessment of the learners' progress in the process of thinking skills development (interdisciplinary, literacy skills). Andrade and Du (2005) relate to rubrics as tools for advancing higher thinking skills (such as self-regulation). When used correctly, they can serve to provide 'evaluation and accountability' (Andrade, 2000, p. 13).

Appendix 3   First meeting with the Head-teacher

Moshe's central question was:

> How will you answer the Bible Studies staff when they ask you how you can teach them or mentor them, telling them what to do, when you don't know much or are not an expert in their field of teaching?
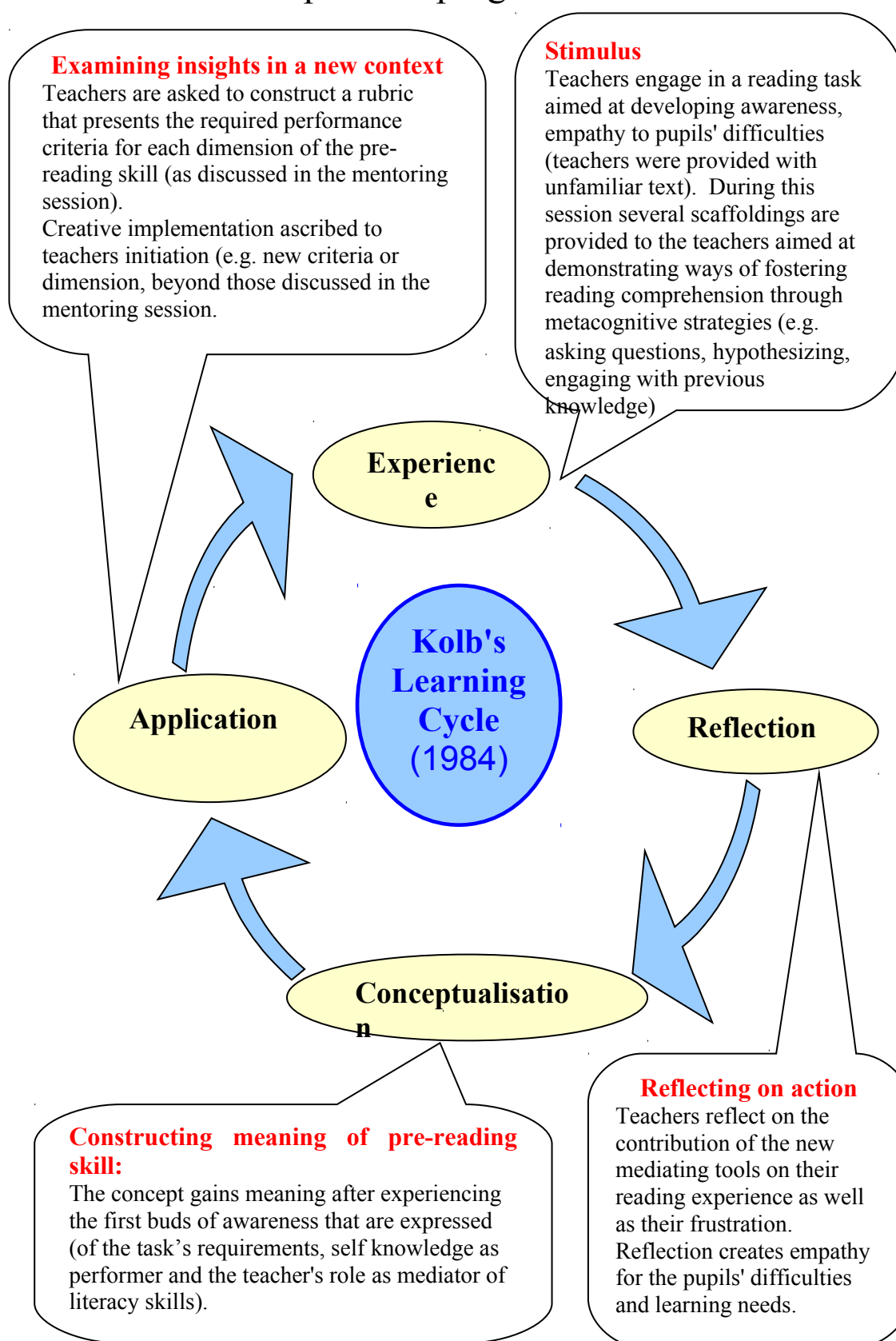
My answer was:

> I can only say that I am not an expert in all knowledge contents, apart from the field of the sciences. My specialisation though is in integrating teaching strategies and skills, within learning programmes. The strategies and skills to which I will expose you transcend disciplines and you, as experts regarding the content, will have the authority and the knowledge to apply the strategies to your teaching.

Moshe's response was:

> You are accepted. Your answer showed me that you understand what I am talking about. Strategies are not something that depends on the teaching content... I want the teachers to introduce strategies so that their lessons will be more varied and the pupils will be freed from exclusively frontal teaching [his tone indicated his frustration]. We had a good experience for many years with Tsipi Meshulam (an Israeli expert who has developed teaching materials, using tools for effective learning - author's note), and I expect it to continue with you.' (Personal journal, August 2001).

My answer also had implications for my success as a mentor in the school. If I had not succeeded in meeting his expectations and his perceived needs of the school, the mentoring programme would not have received the necessary backing and support.

Appendix 4: Example of use of the learning cycle tool in planning/assessing teacher developmental progress

Examining insights in a new context
Teachers are asked to construct a rubric that presents the required performance criteria for each dimension of the pre-reading skill (as discussed in the mentoring session).
Creative implementation ascribed to teachers initiation (e.g. new criteria or dimension, beyond those discussed in the mentoring session.

Stimulus
Teachers engage in a reading task aimed at developing awareness, empathy to pupils' difficulties (teachers were provided with unfamiliar text). During this session several scaffoldings are provided to the teachers aimed at demonstrating ways of fostering reading comprehension through metacognitive strategies (e.g. asking questions, hypothesizing, engaging with previous knowledge)

Experience

Kolb's Learning Cycle (1984)

Application

Reflection

Conceptualisation

Constructing meaning of pre-reading skill:
The concept gains meaning after experiencing the first buds of awareness that are expressed (of the task's requirements, self knowledge as performer and the teacher's role as mediator of literacy skills).

Reflecting on action
Teachers reflect on the contribution of the new mediating tools on their reading experience as well as their frustration. Reflection creates empathy for the pupils' difficulties and learning needs.

Appendix 5 The Mentoring Programme's Teaching Strategy for Mediating Thinking Skills

The following are the details of the programme according its performance in stages:

A.   Studying the Teaching Method and its Strategy

At this stage, the subject co-ordinators and their staff are called to choose inter-disciplinary learning/thinking skills (literacy skill) relevant to their teaching area. According to this allocation of responsibility among the school staff, each team, under a coordinator, is responsible for constructing a mediation module that will constitute part of the school curriculum.

This developmental process was accompanied by the MM. The programme, through which the teaching strategy was studied, was also presented at the teachers' general assembly. From this stage onward, I mediated this process as the school mentor. Each team constituted the source of knowledge (the providing staff) and served as agents for its distribution to other teams for whom the use of these skills was relevant (the applying staff). Sharing knowledge with reference to skill mediation created a school meta-language with relation to thinking/learning skills instruction.

Activity at the subject-matter staff level

Stages in the teachers learning and construction of mediation tools:

A.   Construction of the mediation tools

1.   <u>Construction of a rubric for the chosen skill</u> (e.g. Table 4.2): Articulating the dimensions of a skill provided guidelines for planning the mediation process in stages (skill processing).

2.   <u>Planning a module for skills processing</u>: This stage includes preparing mediation plans for studying the skill components, practising the performance of skills, implementing knowledge in various performance tasks, and assessing the pupils' skill mastery.

B.

1. <u>Formative Stage</u>: Familiarisation with skills components and initial experimentation by the pupils through the teacher's modelling.

2. <u>Practise Stage</u>: Providing exercises for pupils at different levels for developing their performance abilities. At this stage the rubric is presented to the pupils and becomes a central part of the dialogue between the teacher and pupil, among pupils and in the pupil's internal dialogue (pupils are engaged in self evaluation – indicating strength and weaknesses).

3. <u>Implementing Stage</u>: Tasks are given with an emphasis on improving control over skills performance and follow-up of progress at different periods of time. Until this stage, the providing staffs are accountable for the analysis of pupils' progress. From this stage on, specific implementing teams (according to the distribution of labour (Engestrom, 1987, 1999) as decided by the school staff) are responsible for providing the pupils with opportunities to practice the skill in new context (their subject matter). These staffs expand the pupils' learning cycle towards implementation in areas beyond the original context in which the skill was acquired. At the same time, by using the mediation tools constructed by the providing staff, they also contribute through the distribution of knowledge toward the development of a common school language in the field mediating thinking skills.

C. Drafting Benchmarks

The drafting of benchmarks relates to the instruction plan along a three-year continuum (i.e. from Year 7 through Year 9 of the Lower Secondary School in Israel). Incorporation of the module into the three-year teaching continuum includes the determination of teaching stages for each year group.

Activity at the Organisation Level

▪ Division of labour – provision of one skill by one subject-matter staff, and exercising the skill provided by another staff.

- Mapping of the distribution of responsibilities between the different disciplines according to levels of module construction, exercise and implementation – along the three-year studies axis (Years 7-9).

- Distribution of knowledge concerning skills throughout the organisation: exposing products in teacher assemblies and organising a knowledge base (by publishing a pamphlet or through the school site which presents the school curriculum for mediating thinking skills).

Appendix 6: Sample analysis of teacher knowledge in mediating thinking/learning

Context: Focus group interview at the initial stage of the second cycle discourse

Examples of Metacognitive Knowledge		An example of Metacognitive Skills
Declarative Knowledge	Procedural Knowledge	Buds of Self-Direction
Data:	**Data:**	**Data:**
Tamar: (October 2003)	Avi: (October, 2003)	(October, 2003)
'We [the staff] have to discuss the way to instil questioning skills. It is still impossible to talk about exercising '.	'We conducted pre-reading …in Year 7. In Year 8, closer to the national examination [we related to] the form of the page, where everything was placed and what characterised a page of Gemara. [Jewish Law]	Clara: 'We saw that in Year 8 we needed to work a lot on writing a paragraph. ..so that in Year 9 they would be able to write a short composition, it was important that already in Year 7 they would begin the paragraph reading model … this way, when they reach Year 8 we could already at the beginning of the year work on their writing… and we wouldn't waste time on the [paragraph] model. It would help them very much in general, even in comprehension because we [already] gave them complete paragraphs to read.'
	The pupils in Year 9 have a better command of this.'	
	Tiki: What did you do, and how did you do it for each grade level?	
	'Pre-reading in Year 7 hints of content within the Talmudic text, things that help to [understand] content of the Talmudic text …in Year 9 I don't know what was done, but they are familiar with more.. In my class, Year 7, specific reading.	
	I demonstrated reading [and guide them:] trying to identify a question, answer, even without knowing the words. G. [a teacher] also participated with me in instructing them'.	
	Tiki: 'Did all the pupils use the skills language?	
	A: 'No, even the teachers do not use this language [beyond that one-time application]'.	

Examples of Metacognitive Knowledge

An example of Metacognitive Skills

Declarative Knowledge

Context:

These words are said after Pamphlet A for skills instruction (the overt programme) was already written, and under the guidance of this coordinator (Tamar). It included detailed planning that describes the teaching method according to stages that help learners to progress in composing questions at different levels of thinking, including research questions.

Interpretation:

The production of the Pamphlet A, without application of its programme, indicated levels of declarative and procedural knowledge for mediating this skill. It was manifested in naming the different skill dimensions, as well as relating to relevant strategies needed for its performance.

Procedural Knowledge

Context:

As a coordinator, Avi presented a structured programme, which translated pre-reading tools (that had been formulated by the Hebrew language staff) for Talmudic text [texts of Jewish Sages].

Interpretation:

This presentation was interpreted as an indication of metacognitive procedural knowledge. At this stage, Avi's procedural knowledge is relatively more advanced than that of Tamar due to his short experience in the application of the overt learning programme.

Knowledge concerning the thinking strategies that accompany the mediation is technical. This coordinator is not self-regulated enough to apply the programme as presented in Pamphlet A, apart from a partial application. It was assumed at this stage that he had not developed sufficient metacognitive knowledge which could have fostered his self regulation.

Buds of Self-Direction

Context:

Clara presented her staff's decision to include the paragraph model in the teaching of reading skills, already in Year 7.

Interpretation:

Successful implementation in the development of declarative and procedural metacognitive knowledge, in the pilot study, where the pupils of Year 8 led this coordinator (Clara) and her staff to reach a conclusion that contradicted their original plan (presented in Pamphlet A, at the end of the pilot study). Her comments, given above, indicated buds of self-regulation; monitoring previous decisions and making new choices. These acts exhibited her goal orientation and control over task context and effective use of time.

Appendix 7 Using dilemmas and conflicts as a springboard

__Time__: At the beginning of the third cycle of the research (Feb 10, 2004).

__Context:__   An excerpt from an individual mentoring session with Rina. The following discourse shows the dynamic in this participant structure: the teacher shares the difficulties in implementing the comparison skill in one of her classes and, as mentor, I listen, negotiate the meaning of her pupils' behaviour and suggest alternative ways to interpret the pupils' difficulties and challenge them. Both of us do not posses the right answer, but share the same concern.

Rina: 'I have a lot of problems with my class; skills are one of them and frankly, I don't feel up to it.'

Tiki: 'What are the problems in your class?'

Rina: 'Whatever works well in my other classes doesn't work in my class. I have many discipline problems. And they are not nice to each other, they are judgmental, they do not support each other. There are problems in other teachers' lessons as well, except for one activity that I conducted when they were just excellent."

Tiki: 'What was that activity about?'

Rina: 'After you suggested the idea to have them share setting the criteria for the evaluation of their products, in a "Values" lesson I told them that I wanted to share with them the evaluation of their work. They offered to evaluate it by the extent of emotion and sensitivity in the way the paragraphs were described, the number of ideas.'

Tiki: 'May I infer that these guys like to be partners, to have an impact on their learning processes? [Rina is amazed at this possible evaluation and inference]. How do they cooperate in the skill instilling lesson (comparison)?'

Rina: 'Just like in other lessons [they don't].'

Tiki: 'How about integrating in the instilling and exercising the use of a rubric and turning them once again into partners who evaluate themselves or their mates as part of the learning process?'

Rina: 'Are you suggesting that they receive the rubric [for comparison skills]?'

Tiki: 'Indeed, I do, especially with this group that seems achievement-oriented or bonding with the activity when the evaluation criteria are transparent [as in the example you gave me]. In this situation they become partners, meaningful and unthreatened as it seems from what you say that they are fighting within themselves and with other teachers.'

At this point Rina listened attentively. I had the feeling that she received a sort of mirroring that indicates there is another way to interpret behaviour, not only as 'problematic', 'frustrating' and 'nothing can be done with them.'"

Tiki: 'In the comparison skill-mastering test, let them write a reflection; share with them that you want to learn from them how the skill contributes to their learning.'

My suggestion was too early. From her following reaction, I realized that she was still much too occupied with what she went through with her pupils. It was necessary to listen to her description and find a solution together.

Rina: 'It won't work. I gave them a week ago, in an activity I had asked. I will show you, just a moment, I have their works here. I brought a picture of a large tree [shows me a poster] and all sorts of little creatures are hanging on its branches, each in a different posture; some hanging, one is sawing a trunk, one is demonstrably happy. I asked that each choose one creature they identify with. They simply did not cooperate. I did the same activity in other classes but in my class, they just did not cooperate'.

Tiki: 'I am listening to you and, somehow, I am not surprised with what happened here.'

Rina: 'Why?'

Tiki: 'Actually what you wanted was an activity that would give them an opportunity to identify where they were, to talk about it…[so] you come to know them better.'

Rina: 'That is right.'

Tiki: 'Such an activity does not always enable cooperation. You say that they are competitive and can be quite rough amongst themselves, so they may be reluctant to be exposed; those who are very achievement-oriented and critical may be afraid of being criticized. [At this point I thought it would be a good opportunity to make her understand better the tool of reflection writing]. You know, if you want them to co-operate in this kind of activity you can develop a culture of reflective discourse. One cannot take it for granted that pupils want to share their reflective thinking with others. The reflection in itself is thinking about the thinking of whoever performs the activity. Writing the reflection is not always intended for exposure to the whole group. You know, this tool has a potential for use in a variety of instances. Thanks to you, I realise now that it is very important to re-learn this tool in our next assembly meeting. (I am already thinking how I would focus on this tool in order to develop metacognitive thinking, and at the same time I will use it as a tool for the teachers' qualitative evaluation of teaching/learning processes.)

Rina nods. I remind her that despite her present disappointment, on the whole, her pupils show expressions of progress:

Tiki: 'Look, a couple of months ago, try to recall, where were you then. You did not believe that your pupils [in this class] would acquire skills on such a high level of thinking and particularly you did not expect to ask your pupils to draw conclusions [from a comparison task] … today you tell me that they aim at specific criteria and they succeed very well in drawing conclusions.'

After the meeting, Rina seemed relaxed and she complained less. The things that occupied her mind in a way that she could not allocate time for the school activity goals seemed to trigger new insights. I sensed that she gained new strength which might foster her engagement with the next implementing experience.

<u>Two months later (personal journal, 20.4.2004)</u>

Rina did progress in engaging her class in additional growth, where her pupils were involved in self-assessment process [of their progress in mastering the comparison skill]. However, I regretfully found out from her today that she is leaving school. Some political tensions seemed to distract her attention from full engagement in the learning process. I sensed sadness as I was not aware to these difficulties. I was disappointed that I could not find the time to meet with her during the last month. Perhaps I could have assisted her. Was it my tendency to be goal-oriented, the pressure over the last months [where several assembly sessions were cancelled and rescheduled] that took my complete attention away? I could have called her, but I was busy occupied thinking she ought not to be pressured by the activity, I did not think of other important things occupying her…

Appendix 8 Comparison between mediation and traditional teaching of thinking/ learning skills

Traditional Teaching of Skills	Mediation of Skills
	Characteristics of a self-regulated teacher, mediating thinking/learning skills
Towards teaching	**Towards mediation**
Planning teaching determined by the sequence of the book in use, or list of skills.	Building a rubric: naming skill dimensions and phrasing required standards performance criteria
	Getting ready to recruit learner's energy towards skill mediation
	Planning teaching according to learning cycles (designing progress according to the pupils' conceptualization level of the skill)
	Dialogue with colleagues: integrating reflective thinking while constructing the programme with the subject team.
Teaching as telling	**Mediation through reflective discourse in class**
Presents rules and methods for using skills (usually according to directions in the textbook)	Transparency in presenting the rubric with shared dialogue about required operational standards.
Practices skills through implementation tasks.	Instilling skill dimension by stages, mediating implementation tasks within the pupils' ZPD
Conducts general discussion in class	The rubric is integrated in all teaching stages

Traditional Teaching of Skills	Mediation of Skills
	Characteristics of a self-regulated teacher, mediating thinking/learning skills
Summative assessment	**Formative assessment**
Applying summative test for assessment	Diagnoses existing competencies for mediating the next level of progress within the pupil's ZPD.
Giving an overall mark for performance.	
General diagnosis, with no specification of weakness and strengths in reference to the different skill dimensions	Sharing considerations for mediating progress with the pupils.
(General assessment expressions such as: "Has not mastered"," or "Had you practiced more, you would have achieved more.")	
Participant structure	**Participant structure**
The teacher teaches and the pupil is responsible for implementation.	The teacher-pupil discourse conducts a share assessment.
The pupil expected to implement the learnt skill.	The rubric mediates the assessment of the pupils' strength and weakness in skills performance.
Usually no teacher-pupil discourse takes place to assess the pupil's progress on different levels of skill dimensions	Pupils are encouraged to take an active part in meaning negotiation and assessment processes leading to appropriation of strategies in use.
("I taught so they should/know.")	Pupils are responsible for assessing their progress and for being aware of dimensions in need of improvement.

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[i]   Current reforms originated by education policy in industrialized English-speaking countries, mainly the US and the UK. In the United States, reforms have been introduced constantly since the publication of *A Nation at Risk* in 1983. England and New Zealand have had particularly dramatic periods of change during the 1980s and early 1990s.

[ii]   Israeli Schools are divided into primary schools (ages 6-12), junior high schools (ages 12-15) and high schools (ages 15-18). In special cases, vocational schools and military schools (ages 19 or 20) may be included.

[iii]   Any system (based on General System Theory) contains three principal constituents which are used as a core of a system model: unity, parts and relationships (Larses and El-khoury, 2005). This model can be used to describe a system and enable analysis and synthesis of systems. Checkland (1999, in ibid) relates to human activity systems as purposive system, which is defined by an observer. This system represents a conceptual model derived from abstract formulation of *what* the system does and *how* the desired function is performed, and the *why* link between the two *(*Checkland, 1999, in Larses and El-khoury, 2005).

[iv]   Eli Teicher is an organisational counselor and lecturer on organisational learning.

[v]   Michael Kraindler is the head of the Education Faculty in Derby College, Israel.

[vi]   In Israel, matriculation examinations are considered a significant indicator of school quality, demonstrating teacher ability and pupil achievement required for a higher education.

[vii]   'Discourses are forms of language which are generated by the language practices of a group of people with shared interests and purposes'. (Mercer, 1995, p. 81)