THE EVALUATION OF THE OUTCOME OF A THINKING SKILLS PROGRAMME FOR MIDDLE MANAGEMENT IN A FINANCIAL SERVICES INDUSTRY ORGANISATION

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DECLARATION

I, the undersigned, hereby declare that the work contained in this dissertation is my own original work and has not previously in its entirety or in part been submitted at any university for a degree.

SUMMARY

The globalisation of business is probably the most important topic of discussion in business around the world. Globalisation impacts on business processes, and changes in the processes of economic and political liberalisation signify a radical shift in thinking about how the world works and how it should be organised. The process of change consequently means having to deal with increasing complexity. It is the complexity of change that prompts the urgency to improve the thinking of management in an organisation. As adult learners, managers need different competencies to operate; in addition their thinking skills need to be developed, as they are the key drivers in an organisation going through transformation.

In a needs' assessment in a financial services organisation operating in the global environment, a need for training of middle managers to help them improve their thinking skills in order to become more effective thinkers was determined. The need to train adults to develop cognitive skills prompted a specific thinking skills intervention and the facilitation thereof. A Thinking Skills Programme aimed at teaching thinking dispositions and thinking skills was implemented as a programme to teach the managers to become effective thinkers. The study was approached from a programme evaluative perspective. The purpose of the programme was an improvement-orientated evaluation and was designed to evaluate the outcomes of the programme.

Qualitative data was collected through a pre- assessment and post-assessment process. Open-ended questionnaires as well as other

qualitative methods were used in the assessment to capture the data. The data analysis was done through content analysis. In the process of determining the patterns and processes in the pre-assessment, observations, semi-structured interviews, field notes and post–assessment, the researcher looked for themes or interconnections that emerged in the units, sub-categories and categories. The sub-categories that emerged were derived from the frequency of appearance in the answers of the participants in the questionnaires.

The post-assessment feedback categories indicated that a shift in effective thinking had taken place in the participants. The most significant difference in their thinking was the awareness of their thinking.

They reflected on their thinking while solving problems, which is evidence of effective thinking. They used the thinking tools to help them solve problems. The intervention influenced the participants to be more creative in solving problems, which was not evident in the pre-assessment.

The evaluation of the outcome of the programme through the application of a Thinking Skills Programme was successful. This was demonstrated by the fact that in the measurement of the outcome of the programme it was evident that the middle managers had become more aware of their thinking and that they applied the thinking dispositions and thinking tools in their daily managerial activities. They had become more effective thinkers.

OPSOMMING

Die globalisering van die sakewêreld is waarskynlik die belangrikste besprekingspunt in dié sektor regoor die wêreld. Globalisering het 'n impak op sakeprosesse, en veranderings in die prosesse van ekonomiese en politieke liberalisering dui op 'n radikale verandering in denke oor hoe die wêreld werk en hoe dit georganiseer behoort te word. Die proses van verandering dui gevolglik daarop dat daar rekening gehou moet word met toenemende kompleksiteit. Dit is die kompleksiteit van verandering wat aanleiding gee tot die belangrikheid daarvan om die denkvaardighede van die bestuur in 'n organisasie te verbeter. As volwasse leerders benodig bestuurders verskillende vaardighede om hulle taak te verrig, en hulle denkvaardighede moet ontwikkel word aangesien hulle die dryfkrag is van 'n organisasie wat transformasie ondergaan.

In 'n behoeftebepaling in 'n finansiële dienste organisasie wat op die wêreldmark meeding, is die behoefte geïdentifiseer aan opleiding vir middelvlak bestuurders om hulle denkvaardighede te help verbeter, ten einde van hulle meer effektiewe denkers te maak. Die behoefte om volwassenes op te lei in die ontwikkeling van kognitiewe vaardighede het aanleiding gegee tot 'n spesifieke denkvaardigheidsintervensie en die fasilitering daarvan. 'n Denkvaardigheidsprogram gemik op die onderrig van denkdisposisies en -vaardighede is as 'n program ingestel om bestuurders op te lei om effektiewe denkers te word. Die studie is benader vanuit 'n programevaluasie-perspektief. Die doel van die program was 'n verbeteringsgeoriënteerde evaluasie en dit is ontwerp om die uitkomstes van die program te evalueer.

Kwalitatiewe data is versamel deur middel van 'n pre- en postassesseringsproses. Oopeindevraelyste asook ander kwalitatiewe metodes is in die assessering gebruik om data te versamel. Die data-analise is gedoen deur inhoudsanalise. Vir die bepaling van die patrone en prosesse in die pre-assessering, is observasies, semigestruktureerde onderhoude en veldaantekeninge gebruik. Vir die postassessering het die navorser gesoek na temas of interkonneksies wat na vore gekom het in die eenhede, subkategorieë en kategorieë. Die subkategorieë wat na vore gekom het, is geïdentifiseer op grond van die frekwensie van voorkoms in die antwoorde van die deelnemers wat die vraelyste voltooi het.

Die terugvoeringskategorieë in die postassessering het aangetoon dat 'n verandering in effektiewe denke by die deelnemers plaasgevind het. Die mees beduidende verandering in hulle denke was die bewustheid van hulle denke.

Deelnemers het gereflekteer op hulle denke tydens probleemoplossing, wat as bewys dien van effektiewe denke. Hulle het die denkinstrumente gebruik om hulle te help om probleme op te los. Die intervensie het tot gevolg gehad dat die deelnemers meer kreatief tydens probleemoplossing was, wat nie tydens die pre-assessering geblyk het nie.

Die evaluering van die uitkoms van die program deur die toepassing van 'n Denkvaardigheidsprogram was suksesvol. Dít is gedemonstreer deur die feit dat in die meting van die uitkoms van die program dit duidelik geblyk het dat die middelvlak bestuurders meer bewus geraak het van hulle denke en dat hulle die

denkdisposisies en denkinstrumente in hulle daaglikse bestuursaktiwiteite toegepas het. Hulle het meer effektiewe denkers geword.

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CHAPTER ONE

INTRODUCTORY ORIENTATION

1.1 INTRODUCTION AND BACKGROUND

Organisations today are increasingly and intensely experiencing the disruptive changing business environment as globalisation encompasses and impacts on business in many different ways (Goman, 1992:1; Kotter, 1996:161; Marquardt, 1999:3; Garten, 2003; Lieberthal & Lieberthal, 2003). The New Economy has ushered in great business opportunities - and great turmoil. Not since the Industrial Revolution have the stakes of dealing with change been so high (Marquardt, 1999:16; Garten, 2003; Lucier, Schuyt & Spiegel, 2003).

The globalisation of business is probably the most important topic of discussion in business around the world (Human & Horwitz, 1992:1; Micklethwait & Wooldridge, 1997:110; Garten, 2003; Lucier, Schuyt & Spiegel, 2003).

South African companies need to participate in globalisation to ensure economic growth and prosperity. There is a dire need to search for an African business cultural renaissance that will enable Africa to create a space for itself in an overcrowded global market (Sunter, 1997:18).

Changes in the processes of economic and political liberalisation signify a radical shift in thinking about how the world works and how it should be organised. Globalisation makes the world a smaller place - a global village - but it also makes it a complex network of economic units competing fiercely for business (Human & Horwitz, 1992:2; Micklethwait & Wooldridge, 1997:110; Marquardt, 1999: 16; Kanter, 2001; Garte, 2003). The process of change consequently means having to deal with increasing complexity (Forsha, 1992:7; Kotter, 1996:162; Christensen & Overdorf, 2000:66; Garten, 2003; Lucier, Schuyt & Spiegel, 2003). The modern organisation looks more like an organism or, in fact, a brain, than a simple machine. Handy (1995:73) sees the modern organisation as a federation of relatively autonomous but co-ordinate business units.

It is this complexity of an organic organisation that prompts the urgency to change the thinking of management in an organisation. Management needs different competencies in order to operate and

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their thinking skills need to be developed, as they are the change agents in an organisation going through transformation (Kotter, 1996:161; Hamel & Prahalad in Micklethwait & Wooldridge, 1997:113; Handy, 2002; Heifetz & Linsky, 2002).

The organic organisation needs to become a learning organisation and has to focus on the learning of the adult (Kotter, 1996:161; Marquardt, 1999:34). Research by Jarvis (1995:1) suggests that human learning is a lifelong process, one which has acquired greater significance as the speed of change in society has increased so that its members are almost compelled to keep learning in order to remain members. There is a great focus on experiential and action learning in adult learning as adult education itself has become very learner-centred. A great deal of vocational education and even learning in the workplace has emphasised the work experience (Brookfield, 1986:16; Marquardt, 1999:17).

Adults use experience as a resource in learning, so the learning content and process must bear a perceived and meaningful relationship to past experience. What is to be learned should be related to the individual's developmental changes and life tasks (Brookfield, 1986:31;Cottrell, 2003). The experience of adults, the knowledge a person owns, is also known as Personal Practical Knowledge. It comes from their lived experience and their reflections on that experience. Experiential learning forms an integral part of adult learning. The knowledge is internal to the self (Butler, 1994). When people learn, they undergo the process of transforming that present experience into knowledge, skills, attitudes, values and emotions. It is a matter, therefore, of

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modifying the individual biography, which in its turn will affect the manner by which future situations are experienced. This will influence their perception of change, and their thinking regarding how to manage it (Brookfield, 1987:140; Jarvis, 1995:51; Heifetz & Linsky, 2003). It results in achieving the adults' core competencies and building the core capabilities of the organisation. The biggest problem with focusing on core competencies and capabilities, however, is the basic conservatism of human nature: most people go on thinking about problems in the same way, using the same old technologies and satisfying the same old customers. De Bono (2000:50) argues that this is the very problem with a person's old thinking and rather stale judgement, that if something is good, then surely more of it is better? Once a person has applied the judgement value of "good", then that thinking is good and it has been placed in the "good-to-have" box and more of it is wanted. Yet there are so many instances where this is simply not true - especially in a globalised environment in the New Economy (Mentkowski, 2000; Johnson, 2000; Cottrell, 2003).

Adult learners don't always respond to a potential learning experience: perhaps because they are too busy to think about it or perhaps because they are fearful of its outcome (Brookfield, 1987:89; Jarvis, 1995:90; Bloodgood & Morrow, 2000:208; Cottrell, 2003). This must be carefully considered when organisations deal with change.

In the transformation process of an organisation the managers and leaders are confronted with ambiguity and uncertainty (Katz, Weise & Yang, 2002). Isenberg (cited in Brookfield, 1987:143)

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acknowledges that perhaps more than most experts, managers work within uncertain environments, knowable and known only in equivocal terms. In such ambiguous, contextually variable settings, learning takes the form of critical inquiry and reflection rather than the acquisition of previously specified performance behaviours (Cottrell, 2003).

The financial service industry - in the South African context - is entering the global market and therefore needs to become part of it. The people in this industry need to be equipped with the relevant skills to operate and function optimally in this environment of drastic changes.

1.2 RESEARCH PROBLEM

The many changes and general transformation experienced by organisations in the global economy (such as the organisation in this study) have created a need for effective middle management. Middle managers are the people who have to make real changes happen and they deal directly in a personal way with the rest of the employees. They are the ones who have to implement the change.

People in middle management were frequently promoted through the ranks and were not exposed to leadership development programmes as they were often overloaded with work. The focus of the organisation was generally not on developing these managers (Micklethwait & Wooldridge, 1997:134). The hierarchy and machine-like structure of organisations did not cater for the development of middle management. Michalko, 2001). There was not a need for the development of middle managers as these

managers operated only on the operational level and did not need to be creative, innovative and experiential (Micklethwait & Wooldridge, 1997:136). The middle management manager is under pressure to think differently on an operational level and strategic level.

As discussed earlier, the focus in the business environment has changed dramatically of late because of the demands of the global environment and the New Economy. Today these managers need to be effective thinkers; they need to become lifelong learners; they need to improve their knowledge and ability to apply the strategies effectively in the work environment. The emphasis should be on the experiential or self-discovery method of learning (active learning). The focus of the learning must be on the brain's capacity to reflect. This involves the learners' thinking about their thinking. It involves the ability to be conscious of what experiences they are having; what they are learning; what changes are happening around them; and to decide or choose to make a mental adjustment as a result. This will provide an organisation with the competitive edge.

In order to make a mental adjustment, effective thinking skills are needed. The problem is that members of middle management generally lack these skills as they were not formally trained to develop them (Garten, 2003; Lucier, Schuyt & Spiegel, 2003).

Thinking skills and strategies and the right thinking attitudes can be developed through training and implemented in the workplace to create the effective changes and transformation that are needed in

organisations today (De Bono, 2000:56; Michalko, 2001; Cottrell, 2003). Such a training programme needs to be designed, implemented and evaluated in a financial service organisation.

1.3 AIM OF THE STUDY

Middle management managers (in a business environment) who have been trained and evaluated as effective thinkers can become more effective thinkers in the execution of their jobs as a result of the training.

The following outcomes will be evident:
- They will be aware of their thinking processes.
- They will understand that they can develop their thinking ability to become effective thinkers.
- They will have thinking dispositions and use thinking tools to help them to transfer their learning in order to become effective thinkers.
- They will change in the way they manage conflict in the business, think strategically, solve problems, and make decisions.
- They will be aware to apply creative thinking in the workplace.

1.4 RATIONALE

The globalising economy, the technological demands of shortening product life cycles and competitive imperatives created by converging industry boundaries, force leaders to realise that they are trying to implement third-generation strategies through second-generation organisations run by first-generation managers (Ghoshal

& Bartlett, 1997:9; Offerman, 2003; Davenport, Prusak & Wilson, 2003).

The corporate world, as we know it, is surely in the throes of its last days (Goman, 1992:3; Gibson, 1998:1; Christensen & Overdorf, 2000:66; Irwin, 2002; Garten, 2003; Lieberthal & Lieberthal, 2003). Although most change agents speak as if they understand that, they more often than not tinker with the structures and processes in the name of change when what is needed is a total metamorphosis - so that the outcome is as different from the past as a butterfly is from a maggot (Kanter, 2001; Handy, 2002). Leaders and management need the genetic coding to shift from larvae to butterflies. That's how deep the change process needs to be. They need to interrogate the very soul and mind of the organisation and the souls of the people.

We have grown accustomed to changing only in reaction to outside forces, yet the wellspring of real learning is aspiration, imagination, and experimentation (Goman, 1992:7;Mentkowski, 2000; Cottrell, 2003). In order to cope with all the changes in the environment, an organisation must become a learning organisation where employees and the employers are adult learners who are committed to lifelong learning (Jarvis, 1995:1; Micklethwait & Wooldridge, 1997:148; Paul, 2001). Reactiveness is a double bane of continuous learning. First, the attitude, "If it ain't broke don't fix it," prevents the steady improvement of products and processes. When something is broken, the immediate reaction is to call the expert - a specialist - to fix it. Regardless of the specialist's success, his intervention will create a black-box mentality that prevents the

organisation from developing its own capacities for continual learning (Sampson,1995:197; Micklethwait & Wooldridge, 1997:148;Kanter, 2001; Handy, 2002).

The brain patterns of the adult learner must be changed as these brain patterns that relate to dealing with change - inferiors or superiors - in an organisation are set, which is why it is so difficult to change one's behaviour. The persuasiveness of a reactive stance in management is evident in the fixation on problem solving (another set pattern). Many managers think that management is problem solving (Johnson, 2000; De Bono, 2000:43; Lieberthal & Lieberthal, 2003). Problem solving is fundamentally different from creating. The problem solver tries to make something go away. A creator tries to bring something new into being. This creates learning opportunities for the adult learner (De Bono, 2000: 43; Costa & Kallick, 2000; Paul, 2001).

The disposition and attitude of design and creation rather than reactiveness need to be trained and internalised in the people that need to bring about the change. The mindset and thinking of the managers that need to implement the third-generation strategies need to change to cope and excel in turbulent, ambiguous change. De Bono (2000:17) emphasises this by stating that to change a company, an industry or a whole country is going to take more than just talking about how beneficial it will be to change. It takes reprogramming; chipping away at the old concrete and setting up new patterns in its place. It may need specific strategies, which can be learned (Kanter, 2001; Handy, 2002).

1.5 DELIMITATIONS

- The study is aimed at middle managers in a financial services organisation. A questionnaire designed on this level in terms of comprehension could be applied to the higher – and lower level managers as well.
- The questionnaire was applied in a business setting but could also be used in a community setting, for instance, within the context of adult learners who need to become more effective thinkers and thus effective problem solvers.
- The intervention methods and techniques were not evaluated; only the outcomes of the intervention were.
- The study was done in a Financial Services Industry environment but the programme can be applied in any organisational environment.
- Managers within the same organisation were not compared with each other in order to evaluate them or to identify the most effective thinkers.

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1.6. CLARIFICATION OF CONCEPTS

For the purpose of this study the following operational definitions were used:

1.6.1 Change

The concept of change used in this research refers to the change experienced in the late 1990s and the early 21st century.

To change is to move from one area of contentment to a new area of the unknown and to learn how to translate the new experiences in one's own personality and close environment that can be

influenced (Costa & Kallick, 2000; Mentkowski, 2000; Paul, 2001). According to Toffler (1993:170), the change experienced is the deepest rearrangement of global power since the birth of industrial civilisation.

Change is not only rapidly faster but it is discontinuous (Handy, 1995; 2002; Kanter, 1995; 2001; Drucker, 2001;Irwin, 2002). This change is experienced in an environment of global competitiveness where for customers, consumers and citizens alike, the global information economy offers more and faster information, fewer geographical constraints, and greater access to world products and service (Kanter, 2001; Katz, Weise & Yang, 2003; Garten, 2003).

By any objective measure, the amount of significant, and often traumatic, change in organisations has grown tremendously over the past two decades. Powerful macroeconomic forces are at work here, and these forces may grow even stronger over the next decades (Kotter, 1996:3; Kanter, 2001; Garten, 2003). As a result, more and more organisations will be pushed to reduce costs, improve the quality of products and services, locate new opportunities for growth, and increase productivity (Kotter, 1996:3; Lucier, Schuyt & Spiegel, 2003; Davenport, Prusak & Wilson, 2003).

The concept of change described above applies to the organisation where the study was conducted.

1.6.2 Globalisation

Many forces are driving companies around the world to globalise in the sense of expanding their participation in foreign markets. An

industry is global to the extent that there are intercountry connections (Yip, 1995; Ghoshal & Bartlett, 1997; Conger, Spreitzer & Lawler III, 1999; Kanter, 2001; Irwin, 2002; Morris & Kuratko, 2002; Garten, 2003; Lucier, Schuyt & Spiegel, 2003).

1.6.3 Old and New Economy

The Old Economy existed in a time that stood for predictability, job stability, manufacturing processes, corporate patriarchy, and five-year plans. In the Old Economy, companies held that the means to produce additional units of product or service at little or no cost was a sustainable competitive advantage. In order to accomplish this, large investments were placed in infrastructure, physical plants and channels of distribution (Yip, 1995; Conger et al., 1999; Kanter, 2001; Garten, 2003).

The New Economy prevails in a period of increasing global activity marked by sustained deflationary pressures and technology - driven interactivity. These factors simultaneously support higher rates of consumption and investment (Yip, 1995; Kanter, 2001; Garten, 2003; Lieberthal & Lieberthal, 2003). In the New Economy the importance of ownership of the means of production has been replaced with importance of the ownership of the customer. In this economy, information about the customers - which is dynamic and difficult to acquire - has become invaluable (Yip, 1995; Katz, Weise & Yang, 2003).

Globalisation and the New Economy have a major impact on the organisation as an international company, where the participants operate and influence the way they manage.

1.6.4 Thinking skills

Cognition describes how people receive, store, retrieve, transform, and transmit information (Merriam & Caffarella, 1991:179). In the process the mind functions as an integrated whole. Lozanov (1979) makes the statement that the functional unity of the brain is unbreakable, therefore the emotional and motivational complex, the image thinking and logical abstraction, must be activated simultaneously.

In the cognitive development of adults the complexity and invisible unity of the brain, as well as the emotional, motivational and cultural context, should be taken into consideration. Vygotsky (1978:56) emphasises that cognition is embedded in culture. Focussing on "pure processing" will therefore not yield the desired outcome.

Cognitive development describes how thinking patterns change over time. This development is often linked to a combination of factors, primarily the interaction of maturational and environmental variables (Merriam & Caffarella, 1991:181).

This research involves the study of adults and therefore a more in-depth discussion of cognitive development in adults is justified. Tennant (1988:77) has noted a number of ways in which Piaget's work has laid the foundation for the understanding of cognitive development in adulthood. Piaget's most salient contributions in this respect are:

- The emphasis on qualitative rather than quantitative developmental changes in cognition (and his related

"structuralist" approach to cognitive development).

- The importance attached to the active role of the person in constructing his or her knowledge (with the implication that learning through activity is more meaningful [than passive learning]).
- A conception of mature adult thought (that is, formal operations).

Another theory on adult cognitive development is that of Riegel (1973). According to Riegel (1973:350), "dialectic conceptualization characterizes the origin of thought in the individual and in society [and] represents a necessary synthesis in the development of thought toward maturity".

Benack and Basseches (1989:98) also describe dialectic thinking as a postformal stage of thought. They have operationalised dialectical thought into a "dialectical schemata framework" consisting of 24 schemata representing different "moves in thought that dialectical thinkers tend to make".

Arlin (1975:603) contends that formal thought actually consists of two distinct stages, not one, as proposed by Piaget. In her framework, Piaget's formal operations stage is renamed the problem-solving stage; the focus in this stage is on "the process of seeking a solution of a specific presented task". Arlin (1975:603) then hypothesises a new fifth stage, the problem-finding stage, characterised by "creative thought vis-à-vis discovered problems" and the ability to generate and respond to important new questions and answers.

According to Perkins (1992) the emphasis in adult cognitive development is on the dispositional side of thinking and it implies that development involves more than just the growth of cognitive abilities. Dispositions are grounded in belief systems, values, and attitudes as much as in cognitive structures. A culturally-based account of development is needed.

There are multiple forms of intelligence that impact on thinking. This theory of multiple intelligences has been designed by Gardner (1983). Gardner's research ran counter to Piaget's notion that the use and interpretation of various symbol systems were all aspects of one intellectual function. The important aspect of the theory of multiple intelligences is the connection between intelligence and thinking. The various types of intelligence define forms of thinking. The way a person thinks and the types of questions, problems and issues about a person thinks are, perhaps, the most defining feature of that person (Gardner, 1983). In the teaching of thinking skills the facilitator has to find ways of encouraging the use of all kinds of intelligence.

The application (use of) of thinking skills is influenced by an individuals thinking style. Constructs of social, practical, and emotional intelligence, or of multiple intelligences, expand the notion of what people can do – but the construct of style expands the notion of what people prefer to do – how they capitalise on the abilities they have (Sternberg, 1999). The construct of thinking styles is incorporated in this study as part of the pre-assessment process.

For the purpose of this study the concepts of Vygotsky, Arlin and Perkins and Sternberg on cognition and thinking skills will be used. A

combination of these concepts will focus on cognition embedded in culture where the adult learner needs to cultivate thinking dispositions to operate on a cognitive level to find creative solutions to discovered problems.

1.6.5 Middle management

These are the managers operating on the level between the staff members who report to them and top management to whom they report. The role of the middle manager is an integration role: integrating and managing expectations from executive management, while meeting the needs of the managers below. Often the needs and expectations of these groups are different, making it important for the middle manager to integrate different perspectives, whilst influencing them.

The middle manager is responsible for managing entire processes, rather than part of a process. Again the need for integration between short-term and long-term pressures, and between short-term priorities and long-term goals, is important.

The balance between delivery at an operational level and operating at a strategic level is almost equally split at this level of management. Middle managers need to know and understand how strategy is determined, give input into the process, but also deliver and drive implementation of the strategy.

Managing managers is a key part of this role, and they are expected to develop and empower their management team, while building and managing interpersonal dynamics and relationships amongst teams.

1.6.6 Financial services organisation

A Financial services organisation is an organisation that answers to the financial needs of a society (individual as well as employment needs) and supports those services. Some of the organisations that operate in the South African environment are Old Mutual, SANLAM, Liberty Life, and Momentum Life.

1.6.7 Evaluation

There is no widely agreed-upon definition of evaluation. Some authors equate evaluation with measurement. Others define evaluation as the assessment of the extent to which programme objectives have been attained. For some, evaluation is synonymous with professional value judgement, whereas others argue that it is essentially a political activity. After a careful review of all these viewpoints, Worthen and Sanders (1987) define evaluation as "determination of a thing's value". Case, Andrews and Werner (1988) provide a comprehensive definition of evaluation. According to them, to evaluate is to make an explicit judgement about the worth of all or part of a programme by collecting evidence to determine whether the programme has met acceptable standards. The latter definition of evaluation will be used in this research.

Evaluation of a programme focuses on the process of assigning "worth" or determining the "value" of a programme or activity (Suvedi, 2002). Evaluation in this instance is the process of collecting information about a programme's actual inputs and/or outcomes and then comparing that information to some preset standards or expectations and a judgement is made about the programme or activity (Patton, 1986; Worthen & Sanders, 1987; Wholey, Hatry &

Newcomer, 1994; Fink, 1995; Fraenkel & Wallen, 1996; Suvedi, 2002).

1.7 RESEARCH DESIGN AND METHODOLOGY

This section gives a brief overview of the research design and methodology employed for the development and empirical evaluation of the measuring instrument to investigate effective thinking processes when middle managers manage in the organisation.

1.7.1 Research design

According to Babbie and Mouton (2001:74) a research design is a plan or a blueprint of how research is conducted. Programme evaluation is utilised in this study as a means of conducting the research. Programme evaluation entails the use of scientific methods to measure the implementation and outcome of programmes for decision-making purposes (Rutman, 1977:10).

Programme evaluation is essentially an information-gathering and interpreting activity that attempts to answer a set of questions about a programme's performance and effectiveness (Mouton, Wildschut & Boshoff, 2000:119). To conduct evaluation research, the researcher must be able to operationalise, observe and recognise the presence or absence of what is under study (Babbie & Mouton, 2001:336). The purpose of the evaluation in this study is improvement-orientated. The different forms of improvement-orientated evaluations - formative evaluation, quality enhancement, responsive evaluation, empowerment evaluation – are concerned with improving the programme. Various questions can be asked during the evaluation process: What are the programme's strengths and weaknesses? Has

the programme been properly implemented? What constraints are there on proper implementation? Are the participants in the programme responding positively to the intervention? If not, why not?

It is important to monitor the programme during the delivery to ensure effective transfer of knowledge and to assess (through dynamic assessment) whether cognitive development has taken place in every phase if the programme.

The goals and objectives of the programme should be frequently stated in clear terms so that there is absolute clarity on how they might be measured. Therefore objectives should be clear and concise and they should be measurable, as measurable outcomes are the signals of success. This will indicate whether the objectives have been achieved. The closer the objectives are to outcomes that can be directly and reliably measured, the more likely it is that a competent evaluation will result (Rossi & Freeman, 1993:117).

1.7.2 Research methodology

1.7.2.1 Methods of data collection

Qualitative data include information which was typically collected by allowing questions to be answered in the participant's own words. Such information is collected through open-ended questions in pre-assessment and post-assessment questionnaires, semi-structured interviews and during observation. In the process, the researcher is an important research instrument, who, as a participator, is responsive to the context (Miles & Huberman, 1984:10; Merriam, 1988:16-19; Silverman, 1993:27).

1.7.2.2 Methods of data analysis

Analysis of qualitative data is sometimes tedious and it may involve a lengthy process. This is because respondents answer in their own words, and it is often difficult to categorise, classify, and tabulate responses without losing their meaning. Analysis of qualitative data requires synthesis (Schwandt, 1997:21). It requires strong interpretative skills and human insight instead of "volume" of responses. These meanings or understandings constitute the findings of the study relating to category construction and theory building.

In this study the qualitative data collected through the open-ended questionnaires, observations and semi-structured interviews were analysed with the help of content analysis. Content analysis is a generic name for a variety of means of textual analysis that involves comparing, contrasting and categorising a corpus of data. Classic content analysis emphasises systematic, objective, quantitative description of content derived from research-developed categories. In content analysis, the researcher uses objective and systematic counting and recording procedures to produce a quantitative description of the symbolic content in a text (Neuman, 2000:293). Content analysis is nonreactive because the process of placing words, messages, or symbols in a text to communicate to a reader or receiver occurs without influence from the researcher who analyses its content (Neuman, 2000:293).There are qualitative or interpretive versions of content analysis. The emphasis here is on quantitative data about a text's content (Schwandt, 1997:21; Neuman, 2000:293).

1.7.3 Validity and reliability

Validity questions whether the instrument measures what it purports

to measure. Aikenhead and Ryan (1992:487) define validity in terms of trustworthiness - the trust that one researcher has for the work of another.

To enhance internal validity in the research the following were used:

- Triangulation: it is a procedure used to establish the fact that the criterion of validity has been met. Multiple sources of data, multiple methods of data collection and a holistic understanding of the situation were employed to construct plausible explanations of any particular phenomenon. The central point of the procedure is to examine a single social phenomenon from more than one vantage point.
- Member checks: data and tentative interpretations were continuously checked with participants during programme delivery.
- Researcher's position: the researcher's assumptions, world-view and theoretical orientation in the context of the organisation were clarified at the outset of the programme delivery with senior management and participants.

Findings were generalised beyond the situation that was studied to identify external validity.

To enhance reliability in the research, triangulation was used. Multiple methods of gathering data and of establishing the sources of data were used. In order for an audit to take place, it was described in detail how data were collected, how categories were derived and how decisions were made throughout the study (Merriam, 1998:206).

1.8 ETHICAL STATEMENT

Participants were assured of confidentiality throughout the research process and reporting of the results. This corresponds with assessing employees' behaviour (Jacobson, 1996: 30). They were protected from being identified, since names were omitted in the research instruments.

Permission for the use of the CoRT programme was obtained through the licence bought by the company in which the Thinking Skills Programme was used. Permission to use the Sternberg-Wagner Questionnaire on Thinking styles obtained from the author.

1.9 SEQUENCE OF CHAPTERS

The introduction and problem statement for this study have been included in **Chapter One** to provide an indication of the reasons for this research. Both the changing environment within which organisations have to operate has been explained as well as the need for more effective thinking for middle managers in organisations. Concepts have been clarified, hypotheses have been stated and the methods employed have been described.

Chapter Two consists of a review of the literature regarding change as it is experienced in the globalised environment and the impact it has on organisations. A review of adult learners, as middle managers, is presented and the specific requirements when they are trained to learn new skills. The concept of thinking skills in the process of cognitive development is reviewed to give a deeper understanding of how important it is to have more effective thinking skills within a changing environment rather than to react to what exists. The

importance is highlighted of teaching thinking skills and thinking dispositions, which will change the perception of adults (middle managers) and create wisdom (thoughtfulness) (Tishman, Perkins & Jay, 1995:37; De Bono, 2000:7).

Chapter Three describes the research procedure used for this study. The situational context in which the research takes place, selection of the target group, measuring instruments, procedures during the study, data collection and data analysis are described in this chapter.

The results of the empirical section of the study are discussed in **Chapter Four.** This is presented in a qualitative presentation by describing the outcome of the pre- and post-assessment questionnaires as well as observations made in the workplace by the researcher. Semi-structured interviews form part of the qualitative assessment after the intervention.

In the final chapter, **Chapter Five,** conclusions and recommendations for implementation are given, based on the literature review and the results obtained in the empirical section of the study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION

2.2 CHANGE

2.2.1 The characteristics of today's change

2.2.2 Organisational change

2.2.3 Conclusion

2.3 THE ADULT LEARNER

2.3.1 Introduction

2.3.2 Adult education

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2.4 THINKING SKILLS

2.4.1 Introduction

2.4.2 Background on the development of teaching thinking skills

2.4.3 Thinking skills and a changing environment

2.4.4 Creative thinking

2.4.5 Teaching adults effective thinking skills

2.5 CONCLUSION

2.1 INTRODUCTION

An overview of the existing literature pertaining to the key concepts in this study will be given in this chapter. The main concepts are change, the adult learner and thinking skills.

A literature review tends to involve the researcher in exploring the literature to establish the status quo, formulate a problem or research enquiry. It defends the value of pursuing the line of enquiry established, and compares the findings and ideas with the researcher's own. The product of the literature review involves the synthesis of the work of others in a form which demonstrates the accomplishment of the exploratory process (Bruce, 1994:5-37).

2.2 CHANGE

2.2.1 The characteristics of today's change

More than anything else, today's business and political experts are talking about change (Peters, 1989; Beck & Cowan, 1996:71; Ghoshal & Bartlett, 1997:9; Kanter, 1995:1; Irwin, 2002; Davenport, Prusak & Wilson, 2003). The interest is justified. The years of the 1990s and early twenty-first century have been an era of transition (Beck & Cowan, 1996:71; Katz, Weise & Yang, 2003).

The forces for change - globalisation and technology - will inevitably grow (Kanter, 2001:74-75; Handy,2002). The major challenges that confronted leaders in the 1990s were the result of impasses, failures, log jams, cul-de-sacs, gridlocks and surface level solutions that stemmed from the behavioural, authoritarian, and systems-thinking schools of thought.

Environmental forces forced most companies not merely to adjust or adapt as they had in the past, but to confront the need for major transformational change (Ghoshal & Bartlett, 1997:9).

Among the most powerful of these external forces were the exploding opportunities opened up by the globalising economy, the technological demands of shortening product life cycles and shifting technology platforms, the competitive imperatives created by converging industry boundaries and expanding alliance partnerships, the structural realignment dictated by large-scale deregulation and shifts in the location of strategic assets, and the internal learning capabilities required to succeed in a knowledge-intense environment in the fast emerging information age (Ghoshal & Bartlett, 1997:9; Kanter, 2001:74-75;Katz, Weise & Yang, 2002).

In a global, high tech world, organisations need to be more fluid, inclusive and responsive. They need to manage change and complex information flows, grasp new ideas quickly, and spread those ideas throughout the enterprise. What counts is not whether everybody uses e-mail, but whether people quickly absorb the impact of information and respond to information (Ghoshall & Bartlett, 1997:10; Kanter, 2001:74).

To further the understanding of the turbulent times companies and individuals need to operate in, Beck and Cowan (1996:17) explain it as follows:

> *Late twentieth century folk are caught in a storm of conflicting values. Ethnic eruptions, crises de jour, and ecological uncertainties cloud the future. Neither our business gurus nor our social forecasters had prepared us for the turbulence. At many levels we are flying through turbulent storms of severity and complexity never even*

mocked up in our simulations… We are entering a period of millennium hysteria.

This phenomenon of deep change is not unique. Human history is filled with intervals of turbulence and diasporas. Sometimes retuning and mild adjustments of the status quo restore balance. But occasionally major chaos erupts to trigger order-of-magnitude, epochal changes. This seems to one of those times (Beck & Cowan, 1996:20).

Humankind is at risk because we are prisoners of our own paradigms. The success that is experienced is overwhelming. It was thought that the world we operate in would continue forever along the same trajectories. The thought that it was safe to drive change from the lofty perches put the managers at risk (Beck & Cowan, 1996:21).

Social analyst Toffler (1970; 1993:17) cautions that the old world map is obsolete - we are undergoing the deepest rearrangement of global power since the birth of industrial civilisation.

Handy (1995:45; 2002) states that change is not only faster nowadays but is discontinuous. Such change lacks continuity and follows no logical sequence. During times of discontinuous change, it can almost be guaranteed that what used to work well in the past will not work at all next time round. The old approaches to change are simply too incremental. More than that, they are too slow. Christensen (2001:197) enforces this

statement by focusing on the fact that the amount of information available to managers - as well as the amount of work and judgement required to sort the important from the less important - is increasing exponentially. The pervasive emergence of the Internet is exacerbating these trends.

Human and Horwitz (1992:4), South African researchers in the change management field, focus on the complexity of the environment companies have to deal with. As systems or organisations become more differentiated, the problem is how to integrate or co-ordinate activities. More components and denser interconnections require more sophisticated co-ordinating mechanisms; a system must be as diverse as the environment in which it lives. The change experienced in the environment focuses on the systemic approach of how everything is related to another.

Different times force humankind to think differently (Tromp, 1998). The first harbingers of change are often "Old Testament type" prophets who show up with cries of alarm, predictions of gloom and doom, demands for penitence, and threats of fire and brimstone. Next come visionaries with messianic hopes and dreams who point to Nirvana just ahead. Then the more pragmatic pathfinders emerge without fanfare or hubris to scout through the chaos and confusion and to set about the task of planting the seeds of a new way.

It is in humankind's nature to solve problems, and to create new ones. Human beings love to engage in quests of one kind or

another. From humankind's earlier upright steps as *Homo sapiens* he has trekked from one awakening to another, becoming a slightly different being with every one. New times produce new thinking as new theories of everything are spawned, history is revised, priorities and values are reordered-stacked, and people marvel that they did not see it so clearly before (Beck & Cowan, 1996:24).

The problems that people experienced in the transition to the twenty-first century can only be resolved by solutions that they, themselves, create. The pattern repeats itself: new times demand new thinking. Only this time, the "new thinking" must be more than the next regular step on Emerson's staircase. It must be well beyond the mark (Beck & Cowan, 1996:27).

2.2.2 Organisational change

Kotter (1996:59) is one of the leading researchers in the field of change. His observations of how change is managed in organisations are as follows: over the past decade he has watched more than 100 companies try to make themselves into significantly better competitors. They have included large organisations (Ford) and small ones (Landmark Communications), companies based in the United States (General Motors) and elsewhere (British Airways), corporations that were on their knees (Eastern Airlines), and companies that were earning good money (Bristol-Myers Squibb). These efforts have gone under many banners: total quality management, re-engineering, right sizing, restructuring, cultural change, and turnaround. But, in almost every case, the basic goal has been

the same: to make fundamental changes in how business is conducted in order to help cope with a new, more challenging market environment.

A few of these corporate change efforts have been very successful, as they did not make the eight common errors. Making any of the eight errors common to transformation efforts can have serious consequences. The consequences are: new strategies are not implemented well; acquisitions do not achieve expected synergies; reengineering takes too long and costs too much; downsizing does not get costs under control and quality programmes do not deliver hoped-for results (Kotter, 1996:16). A few have been utter failures (Kotter, 1996:4). Most fall somewhere in between, with a distinct tilt towards the lower end of the scale. In his research he outlines eight major errors an organisation can make in its change management process. These errors are:

- Allowing too much complacency.
- Failing to create a sufficiently powerful guiding coalition.
- Underestimating the power of vision.
- Under communicating the vision by a factor of 10 (or 100 or even, 1000).
- Permitting obstacles to block the new vision.
- Failing to create short-term wins.
- Declaring victory too soon.
- Neglecting to anchor changes firmly in the corporate culture.

Drucker (2001:35) views organisational change as follows:

You have to infuse your entire organisation with the mind-set that change is an opportunity and not a threat. You have to have somebody at the top who enjoys the unexpected. The most important thing I have to tell people at the top of the organizations that they're not being paid for being clever. They're being paid for being right …

Managers whose organisations are confronting change must first determine that they have the resources required to succeed. They then have to ask a separate question: Does the organisation have the processes and values to succeed? Asking this second question is not quite instinctive for most managers because the processes by which work is done and the values by which employees make their decisions have served them well (Christensen, 2001:214). Managers, who face the need to change or innovate, need to do more than assign the right resources to the problem. They need to know that the organisation in which those resources will be working is itself capable of succeeding - and in making that assessment, managers must scrutinise whether the organisation's processes and values fit the problem.

Lakhani (1998:11) describes change as pain. It is not possible for leaders and managers to change organisations without pain. Changes in an organisation always include the people and in the process they go through a change cycle. This cycle includes the following stages: loss (feelings of fear, cautious thoughts and paralysed behaviour); doubt (feelings of resentment, sceptical thoughts and resistant behaviour); discomfort (feelings of

anxiety, confused thoughts and unproductive behaviour); discovery (feelings of anticipation, creative thoughts and energised behaviour); understanding (feelings of confidence, pragmatic thoughts and productive behaviour) and integration (feelings of satisfaction, focused thoughts and generous behaviour).

St-Amour (2001:20) enforces the personal transition by saying that changing an organisation to meet the changing market conditions or strategic goals can be one of the most exhilarating aspects of doing business today, but it can also cause confusion, low morale, high turnover and decreased productivity among employees.

Whether that change takes the form of a merger, acquisition, outsourcing, downsizing, restructuring or streamlining, an organisation cannot successfully achieve its business and financial objectives until a critical mass of employees have completed their individual transitions (St-Amour, 2001:20).

All changing organisations struggle with people-related issues. Most attention is usually given to the organisation in terms of structure, processes, tools, measurements, policies and procedures. But for transition to be successful, people need to buy-in and be committed. Their individual interests, values and competencies must be effectively aligned with the organisation's vision, culture and capabilities (Christensen, 2001:204; St-Amour, 2001:21). For the moment, capabilities-based companies have the advantage of competing against rivals still

locked into the old way of seeing the competitive environment. But such a situation will not last forever. As more and more companies make the transition to capabilities-based competition, the simple fact of competing on capabilities will become less important than the specific capabilities a company has chosen to build (Howard, 1993:37; Alder, 1999).

It is the leaders who have to change the most - and endure the most pain. And as they have the most to lose - comfort, power (especially perceived loss), prestige and position, they resist the most. Effective leadership can make all the difference when change causes confusion, because anything that can be done to minimise the impact of transition will make a positive impact on the bottom line. Any real transformation has to have the dimension of personal mastery to change. If managers are not trained to lead others through the transformation phase effectively, they can remain there a long time (Tromp, 1999; St-Amour, 2001:21). In this process the adult learner (leaders and management) need new thinking strategies to make a paradigm shift in the way they manage. They need to reflect on their thinking and learn experientially to use these new skills.

Decisiveness at the top of the organisation is crucial to keep the pace of change moving. If the pace feels too quick, then it is probably right. Slowing the pace to accommodate overwhelmed employees is not the right strategy (Kotter, 1996; St-Amour, 2001).

The first task of the strategist is the art of achieving a fit

between the organisation and its environment. Cases of corporate decline can usually be explained by an inability to understand the principles of fit. The Concorde aeroplane did not lag behind the environment but was too advanced for its environment. The organisation, then, in coping with the environment, has to address the question of how aligned its human, material and financial resources are to the demands of its environment (Kotter, 1996).

Kanter (1995:75; 2001) argues that changes in the capital market, which have permitted take-overs, mergers, and acquisitions, also change the very structure of the world in which we are operating. It is not that only the technology is changing, that customers are more demanding, that employees have to be listened to in a different way today, but we also need organisations that can operate in a world where everything is subject to constant change.

How do organisations win a game like this? They certainly do not win this game the old fashioned way, with top-down chains of command, with all decisions having to flow to the centre, to headquarters, before anyone in the field can act.

The focus is on intense and global competition, an explosion in information technology and the emergence of a knowledge-based economy, which is constantly reshaping the world's business environment.

Leadbeater (2000:70) puts the emphasis on companies

becoming learning organisations. Companies must create the organisational conditions that lead to the continual acquisition of what Deming termed "profound knowledge". The purpose of organisational learning and the acquisition of organisational knowledge is to provide the foundation for rapid, dramatic organisational change; increasingly the fundamental requirement for organisational success.

What is the learning organisation? Pedler (1999:26) states that it is an organisation that facilitates the learning of all its members and continually transforms itself. Senge, Kleiner, Roberts, Ross, Roth and Smith (1999:16) say it is a group of people who are continually enhancing their capability to create their own future.

To become a learning organisation, according to Vermeulen (1999:16), the knowledge and skills of employees must be lifted on a continuous basis and their attitudes and perceptions constantly changed. To learn and grow (which implies change), has become the backbone of any organisation that wishes to survive and prosper in changing and turbulent markets.

Kofman and Senge (1995:16) propose a new way of thinking, feeling and being: a culture of systems (systemic approach). Fragmentary thinking becomes systemic when we recover "the memory of the whole", the awareness that wholes actually precede parts. Competition becomes co-operation when the "community nature of the self" is discovered and the role of people is discovered as challengers to help one another to excel.

Reactiveness becomes creating when the generative power of language is seen; how language brings forth distinctions from the undivided flow of life.

A study by the Conference Board of Canada found that 66 per cent of organisations that completed restructuring initiatives showed no immediate increase in productivity, more than 50 per cent realised no short term profit improvement and only 30 per cent actually lowered costs (St-Amour, 2001:22). These are staggering statistics that would be enough to discourage any organisation that is contemplating major strategic change. These results are common when organisations focus their change efforts and priorities on processes, finances and structures. There is no foolproof way of making all aspects of organisational change run flawlessly. But by valuing, respecting and communicating with people, by devoting as much effort and attention to the needs of employees, any organisation is well on the way to managing change effectively (Morgan, 2001:1; St-Amour, 2001:22).

Together these changes represent a new "Galilean Shift". Galileo's heliocentric revolution moved us from looking at the earth as the centre around which all else revolved to seeing our place in a broader pattern. In the new systems worldview (systemic approach) we move from the primacy of the whole, from absolute truths to coherent interpretations, from self to community, from problem solving to creating (Kofman and Senge, 1995:17).

2.2.3 Conclusion

The turbulent changing environment in which organisations need to operate (globalisation and New Economy) influences how managers manage change and day-to-day activities.

The demands on middle managers are not to implement any longer, but to be innovative and to design new approaches in the organisational environment. They need different thinking to cope and excel in these turbulent times.

2.3 THE ADULT LEARNER

2.3.1 Introduction

The adult education literature generally supports the idea that teaching adults should be approached in a way that is different from teaching children and adolescents. The assumption that facilitators (teachers) of adults should use a different style of teaching is based on the widely espoused theory of Androgogy, which suggests that "adults expect learner-centered settings where they can set their own goals and organise their own learning around their present life needs" (Donaldson, Flannery, & Ross-Gordon, 1993: 148).

2.3.2 Adult Education

Skilful adult educators have known for a long time that they cannot teach adults in the same way as children have traditionally been taught. Adults are almost always voluntary learners and they simply disappear from learning experiences that don't satisfy them (Knowles, 1970).

Androgogy is premised on at least four crucial assumptions about the characteristics of adult learners that are different from the assumptions about child learners on which traditional pedagogy is premised (Knowles, 1970). These assumptions are that, as a person matures, (1) his self-concept moves from one of being a dependent personality towards one of being a self-directing human being; (2) he accumulates a growing reservoir of experience that becomes an increasing resource of learning; (3) his readiness to learn becomes oriented increasingly to the developmental tasks of his social roles; and (4) his time perspective changes from one of postponed application of knowledge to immediacy of application, and accordingly his orientation toward learning shifts from one of subject-centeredness to one of problem- centeredness (Knowles, 1970).

The adult learner can be viewed as an educated person who has the capacity to generate questions in any domain of knowledge (Mehrmohammadi, 2001). This view of the adult learner is applied in this research, as the target group consists of educated managers in the organisational context.

To transfer knowledge to the educated adult learner the form of learning must be the utilisation of knowledge. An idea or information is useful or productive to the extent that it is put to use in the solution of problems (Whitehead, 1967; Billington, 1988:275)

Freire (Freire & Faundez, 1989:39) looks upon adult education primarily as a medium of social change. In this context he

speaks of "pedagogy of asking questions" and promotes it as the method of social change.

According to Peters (1973:256), adult education should concentrate on the proper understanding of the disciplines of knowledge, since such understanding represents the best preparation for developing the disposition to "ask the reason why of things". This is how the human person is rewarded with the permanent joy, satisfaction and absorption proposed as the ultimate criteria for the justification of education.

Peters (1973) argues that this view of adult education transforms the world view of the educated person and enables him or her, in the educational experience, to have travelled with a different view rather than have merely arrived at a destination.

Martin (1981) views adult education and the educated person from a different perspective and asserts, contrary to what Plato contended, that gender is indeed a difference that makes a difference. What this means, is that the productive (or male) and reproductive (or female) processes are both central to the life of each individual as well as to the life of society as a whole. Therefore, the exclusion of traits and dispositions such as caring, compassion, co-operation, nurturance, sympathy and generosity, traditionally associated with roles females played, is unwarranted and represents an injustice to the round development of man and woman alike.

Martin (1981) therefore argues for a "gender-sensitive" or a

"gender-just" adult education perspective which is a broader formulation that pays due attention to both cognitive development and the development of emotions and feelings. This view is important for this research as it forms a basis for the improvement of thinking skills in adults.

In searching to educate adults to become effective thinkers in order to enable them to manage their staff in the changing environment, one needs to consider the motives these adults have to participate in and commit to the learning process. Houle (1979:430-446) believes that participation in any type of educational activity is usually undertaken for a variety of motives rather than a single one and that these usually reinforce each other. Essentially there should be goal-orientated and activity orientated learners and the main orientation should be learning for its own sake (Novak & Gowin, 1984). This perception links to the understanding that an awareness of why adults attach the meanings the way they do, especially to roles and responsibilities, may be the most significant distinguishing characteristic of adult learning (Mezirow in Tight, 1983).

Contradictions generated by rapid, dramatic change and diversity in beliefs, values and social practices are a hallmark of modern society. Adults in such a society face an urgent need to keep from being overwhelmed by change (Mezirow, 1991:2). Formerly accepted sources of authority and the early learning provided by socialisation and schooling no longer suffice for them. Rather than merely adapting to changing circumstances by more diligently applying old ways of knowing, they discover a need to acquire new

perspectives in order to gain a more complete understanding of changing events and higher degree of control over their lives (Mezirow, 1991:3).

Adult learners continue learning throughout their life, and the studies, courses, training, workshops, friends, and colleagues that they experience affect their thinking, but less and less as they age.

2.3.3 Conclusion

Learning is a basic human need, and the process of learning occurs in most people throughout much of their lives. Hence it is maintained that lifelong education should be regarded both as a human right and a fundamental necessity in any civilised society in order for people to respond to their learning needs, fulfil their potential and discover a place in the wider society.

2.3.4 Adult learning

"Learning can be thought of as a process by which behaviour changes as a result of experiences" (Maples & Webster, 1980 in Merriam & Caffarella, 1991:124). Brundage and Mackeracher (1980:5) define adult learning and state that adult learning refers both to the process which individuals go through as they attempt to change or enrich their knowledge, values, skills or strategies and to the resulting knowledge, values, skills, strategies and behaviour possessed by each individual.

To understand adult development we have to understand what learning is. Learning may be understood as the process of using prior interpretation to construe a new or a revised interpretation of

the meaning of one's experience in order to guide future action (Mezirow, 1991:12). Making meaning is central to what learning is all about. The learning process may be understood as the extension of our ability to make explicit, schematise (make an association within a frame of reference), appropriate (accept an interpretation as our own), remember (recall upon an earlier interpretation), validate (establish the truth, justification, appropriateness, or authenticity of what is asserted), and act upon (decide, change an attitude towards, modify a perspective on, or perform) some aspect of our engagement with the environment, other persons, or ourselves. Learning always involves making a new experience explicit and schematising, appropriating, and acting upon it. We seek validation when, in the process of interpreting an experience, we find reason to question the truth, appropriateness, or authenticity of either a newly expressed or implied idea or one acquired through prior learning. It is important to recognise how crucial the validation of knowledge is to the learning process in adults.

Learning is a dialectical process of interpretation in which we interact with objects and events, guided by an old set of expectations. Thinking and learning are overlapping terms. Thinking here refers to the immediate, conscious psychological processes of associating, differentiating, imagining, and inferring. Interpretations may be the result of intentional thought, but often they also incorporate culturally assimilated or tacit learning. Learning involves using thought processes to make or revise an interpretation in a new context, applying the knowledge resulting from prior thought and/or prior tacit learning to construe meaning

in a new encounter (Mezirow, 1991:13).

The cognitive orientation learning theory proposes that "the human mind is not simply a passive exchange-terminal system where the stimuli arrive and the appropriate response leaves. Rather, the thinking person interprets sensations and gives meaning to the events that impinge upon his consciousness" (Grippen & Peters in Merriam & Caffarella, 1991:129; Dirkx & Prenger, 1997). Currently, a number of research and theory-building efforts take as their starting point the mental processes involved in learning. These efforts include information processing theories, work on memory and metacognition, theories of transfer, mathematical learning theory models, and the study of expertise, computer simulations and artificial intelligence. Cognitively oriented explanations of learning encompass a wide range of topics. What unites these various approaches is the focus on internal mental processes that are within the learner's control (Merriam & Caffarella, 1991).

Humanist theories consider learning from the perspective of the human potential for growth. The emphasis is on a person's experience, the freedom and responsibility he possesses in order to grow his full capacity. Learning is seen as a function of motivation and involves choice and responsibility (Rogers, 1983; Maslow, 1970 in Merriam and Caffarella, 1991: 132, 137; Merriam & Caffarella, 1999).

Social learning theory postulates that people learn from observing other people within social settings. Observational learning is

further influenced by four processes, namely attention, retention (memory), rehearsal and motivation. Social learning theories contribute to adult learning by highlighting the importance of social context and explicating the processes of modelling and mentoring (Merriam & Caffarella, 1991: 139).

Another contemporary perspective on learning, not previously seen as one of the basic learning theories, is constructivism. This concept rests on the assumption that learning is a process of creating meaning or knowledge (Merriam & Caffarella, 1999:264; Gravett, 2001:18; Gagnon & Collay, 2002). Within this particular perception, learning *per se* is defined as "an active process of constructing meaning and transforming" understandings in interaction with the environment. New learning is constructed through the learner's existing knowledge that serves as an interpretative framework. A learner's existing knowledge thus plays a very important role in understanding new information.

The construction of meaning can be an individual process but is very often also a social process. This leads to constructing of new knowledge through interaction and collaboration with other people. This aspect of constructivism, called specifically social constructivism, relates closely to social learning theories. Learning is viewed as a movement from the external to the internal, wherein "thought is mediated by social interaction'" (Houser & Vaughan in Gravett, 2001:20). Language and social interaction are considered the most important mediators of this process of internalisation.

Mezirow's theory of transformational learning has built upon the

foundation of sociologists, psychologists and philosophers to offer adult educators a comprehensive theory of adult learning (King, 1995:49). The theory of transformative learning that has been developed by Mezirow during the past two decades has evolved "into a comprehensive and complex description of how learners construe, validate, and reformulate the meaning of their experience" (Case, 1987; Cranton, 1989; Cranton, 1994:22). Centrality of experience, critical reflection, and rational discourse are three common themes in Mezirow's theory (Taylor, 1998), which is based on psychoanalytical theory (Boyd & Myers, 1988) and critical social theory (Scott, 1997).

The formative learning of childhood becomes transformative learning in adulthood. In order to be free, adults must be able to name their reality, to know it divorced from what has been taken for granted, to speak with their own voice. Thus it becomes crucial that the individual should learn to negotiate meanings, purposes, and values critically, reflectively and rationally instead of passively accepting the social realities defined by others. Transformation theory provides a description of the dynamics of the way adults learn to do this (Mezirow, 1991:3). For learners to change their "meaning schemes" (specific beliefs, attitudes, and emotional reactions), they must engage in critical reflection on their experiences, which in turn leads to a perspective transformation (Mezirow, 1991:167). Mezirow (1991:167) further states that perspective transformation is the process of becoming critically aware of how and why the adult's assumptions have come to constrain the way the adult perceives, understands, and feels about his world; changing these structures of habitual expectation to

make possible a more inclusive, discriminating, and integrating perspective; and finally, making choices or otherwise acting upon these new understandings.

Perspective transformation explains how the meaning structures that adults have acquired over a lifetime become transformed. These meaning structures are frames of reference that are based on the totality of an individual's cultural and contextual experiences and that influence how he/she behaves and interprets events (Taylor, 1998).

The researcher supports the methodology of transformational learning in adults, as this will be the building block of the intervention: to transform the thinking skills of adults and change their behaviour as managers in a changing environment.

The theories of cognitive orientation, humanist theories, social learning and constructivism are also supported by the researcher for this study as underlying methodology to teach thinking skills to adults.

The idea that uncritically assimilated habits of expectation or meaning perspectives serve as schemes and as perceptual and interpretative codes in the construal of meaning constitutes the central dynamic and fundamental postulate of a constructivist transformation theory of adult learning (Mezirow, 1991:4). The constructivism theory rests on the assumption that learning is a process of creating meaning or knowledge (Merriam & Caffarella, 1999:264; Gravett, 2001:18; Gagnon & Collay, 2002). These

meaning schemes and meaning perspectives constitute the "boundary structures" for perceiving and comprehending new data. Experience strengthens the personal meaning system by refocusing or extending the expectations about how things are supposed to be. Mezirow (1991:5; 1995:50) describes this further by stating that the adult allows his meaning system to diminish its awareness of how things really are in order to avoid anxiety, creating a zone of blocked attention and self-deception (Cross, 1981). The meaning schemes that make up meaning structures may change as an individual adds to or integrates ideas within an existing scheme and, in fact, this transformation of meaning schemes occurs routinely through learning. Perspective transformation leading to transformative learning, however, occurs much less frequently (Mezirow, 1978). Mezirow (1995: 50) believes that it usually results from a "disorientating dilemma" which is triggered by a life crisis or major life transition, although it may also result from an accumulation of transformations in meaning schemes over a period of time. Overcoming limited, distorted, and arbitrarily selective modes of perception and cognition through reflection on assumptions that formerly have been accepted uncritically is central to development in adulthood (Mezirow, 1995:50).

Meaning schemes are based upon experiences that can be deconstructed and acted upon in a rational way (Taylor, 1998). Mezirow (1995:50) suggests this happens through a series of phases that begin with the disorientating dilemma. Other phases include self-examination, critical assessment of assumptions, recognition that others have shared similar transformations, exploration of new roles or actions, development of a plan,

acquisition of knowledge and skills for implementing the plan, trying out the plan, development of competencies and self-confidence in new roles, and reintegration into life on the basis of new perspectives.

A crucial dimension of adult learning involves the process of justifying or validating communicated ideas and the presuppositions of prior learning. Uncritically assimilated presuppositions may distort the ways of knowing, involving epistemic assumptions; the way of believing, involving social norms, cultural or language codes, and social ideologies; and the adult's ways of feeling, involving repressed parental prohibitions from childhood that control adult feelings and behaviour through anxiety (Mezirow,1997:5-12).

Meaning schemes, made up of specific knowledge, beliefs, value judgements, and feelings that constitute interpretations of experience, become more differentiated and integrated or transformed by reflection on the content or process of problem solving in progressively wider contexts. Habits of expectation or meaning schemes and perspectives are transformed through reflection on the assumptions that underlie problem solving. As described by Mezirow (1997:5-12), transformative learning occurs when individuals change their frames of reference by critically reflecting on their assumptions and beliefs and consciously making and implementing plans that bring about new ways of defining their worlds. Mezirow's theory describes a learning process that is primarily "rational, analytical, and cognitive with an inherent logic" (Grabov, 1997:89-96).

Reflective learning is an important focus of adult learning. Reflective

learning involves the process of reflection, and theorists such as Freire (1972a, 1972b, *inter alia*; 1973), Mezirow (1977, 1981), Argyris (1982, *inter alia*), Kolb (1984), and Boyd and Myers (1988) have all examined the process of reflection. Because of Freire's work, it might be assumed that all reflective learning has to be revolutionary, but it must not be assumed to be the case. Reflective learning is not automatically innovative. Three types of reflective learning are necessary to be examined: contemplation, reflective skills learning and experiential learning.

Reflection involves validity testing, which can be an integral element in taking thoughtful action or can involve a hiatus in the action process during which a retroactive critique of the content, process, or premises of problem solving takes place. Reflection on assumptions involves critique of these premises that may result in the transformation of both meaning perspective and the experience being interpreted (Mezirow, 1991).

Reflective learning involves assessment or reassessment of assumptions. Reflective learning becomes transformative whenever assumptions or premises are found to be distorting, inauthentic, or otherwise invalid (Askew & Carnell, 1998). Transformative learning results in new or transformed meaning schemes or, when reflection focuses on premises, transformed meaning perspectives (Mezirow, 1991).

A number of critical responses to Mezirow's theory of transformative learning have emerged over the years. One major area of contention surrounding Mezirow's theory is its emphasis upon

rationality (Cranton, 1994; Taylor, 1998). Although many empirical studies support Mezirow's contention that critical reflection is central to transformative learning, others have concluded that critical reflection is granted too much importance in a perspective transformation, a process rationally driven (Taylor, 1998:33-34). A view of transformative learning as an intuitive, creative, emotional process is beginning to emerge in the literature (Grabov, 1997:50). This view of transformative learning is based primarily on the work of Boyd (Boyd & Myers, 1988), who has developed a theory of transformative education based on analytical (or depth) psychology. For Boyd, transformation is a fundamental change in one's personality involving (together) the resolution of a personal dilemma and the expansion of consciousness resulting in greater personality integration (Boyd & Myers, 1988:261-284). The process of discernment is central to transformative education (Boyd & Myers, 1988). Discernment calls upon such extra rational sources as symbols, images, and archetypes to assist in creating a personal vision or meaning of what it means to be human (Boyd & Myers, 1988; Cranton, 1994).

The questions arise: If transformative learning is unique to adulthood, does it require the use of teaching approaches that are geared specifically to adults? Is it true that transformative learning requires that learners address problems through critical reflection? What is clear is that transformative learning demands a different approach by the educator. Although adult learners must decide on their own to engage in transformative learning, educators who wish to promote transformative learning have the responsibility to set the stage and provide opportunities for critical reflection (Cranton,

1994).

When educators are operating in the domain of transformative learning, they help learners examine their beliefs and how they have acquired them by creating situations in which they can debate how their values, assumptions, ideologies, and beliefs have come to be constructed (Newman, 1993).

2.3.5 Cognitive development in adulthood

This research focuses on cognitive development of the adult and it is therefore important to understand this concept in the context of teaching adults (managers) effective thinking skills.

Cognitive development describes how thinking patterns change over time. This development is often linked to a combination of factors, primarily the interaction of maturational and environmental variables (Merriam & Caffarella, 1991:181). Piaget comes to mind when cognitive development is mentioned. Although Piaget's work is entirely focused on childhood cognitive development, his theory has provided the framework for the majority of work completed with adults (Merriam & Caffarella, 1991:182). Piaget proposed four invariant stages of development in an age-gradient fashion. These stages represent "qualitatively different ways of making sense, understanding, and constructing knowledge of the world" (Tennant, 1988:68).

Tennant (1988:77) has noted a number of ways in which Piaget's work has laid the foundation for our understanding of cognitive development in adulthood. Piaget's most salient contributions in this

respect are:

- The emphasis on qualitative rather than quantitative developmental changes in cognition (and his related "structuralist" approach to cognitive development).
- The importance attached to the active role of the person in constructing his or her knowledge (with the implication that learning through activity is more meaningful [than passive learning]).
- A conception of mature adult thought (that is, formal operation).

Summaries of the application of Piaget's theory to adulthood have been completed by a number of authors. The essence of these summaries is twofold. First, within the Piagetian framework there are diverse explanations for how adult cognition develops and possibly regresses over the lifespan. And second, there appears to be sufficient evidence to question the traditional views that cognitive development ends with the formal operations stage (Merriam & Caffarella, 1991:183).

According to Riegel (1973:350), "dialectic conceptualisation characterises the origin of thought in the individual and in society [and] represents a necessary synthesis in the development of thought toward maturity". In essence, dialectic thought explains the contradictory nature of human thought and action. Whereas "formal operational thinking as described by Piaget...involves the effort to find fundamental fixed realities – basic elements and immutable laws" - dialectic thinking "attempts to describe fundamental processes of change and the dynamic relationships through which change occurs"

(Basseches, 1984:24). Thinking in the dialectic sense allows for the acceptance of alternative truths or ways of thinking about similar phenomena that abound in everyday adult life.

Riegel's (1973: 366) basic assumptions are that people do not have to pass through any of the Piagetian levels to reach the higher levels of thinking within the dialectic framework and that people can operate simultaneously on all levels. In proposing this system, Riegel argued that people are not only ready to live with life's inherent contradictions and ambiguities but accept "these contradictions as a basic property of thought and creativity".

Arlin (1975:603) has sought to identify a fifth stage of development. She contends that formal thought actually consists of two distinct stages, not one, as proposed by Piaget. In her framework, Piaget's formal operations stage is renamed the problem-solving stage; the focus in this stage is on "the process of seeking a solution of a specific presented task". Arlin (1975:603) hypothesises a new fifth stage, the problem-finding stage, characterised by "creative thought vis-à-vis discovered problems and the ability to generate and respond to important new questions and problems".

Labouvie-Vief (1980:153) contemplates a different theory: "While the theme of youth is flexibility, the hallmark of adulthood is commitment and responsibility. Careers must be started, intimacy bonds formed, children raised. In short, in a world of a multitude of logical possibilities, one course of action must be adopted. This conscious commitment to one pathway and the deliberate disregard of other logical choices may mark the onset of adult cognitive maturity."

In studying cognitive development in adulthood, Labouvie-Vief (1984:256) postulates that "it may be variables related [more] to one's social context rather than to one's age that account for particular developmental gradients" in cognition.

Other researchers have posited entirely new schemes of adult cognitive development. These alternative systems range from the traditional stage theories of development, such as the work of Perry (1970, 1981), to those theories represented by the work of John-Steiner (1985) and Rybash, Hoyer, and Roodin (1986), that advance a comprehensive and complex view of how adults' thinking processes develop (Merriam & Caffarella, 1991). Again, as in the work that primarily evolved from Piaget's formal system of logical thought, the two basic themes of dialectic and relativistic thought patterns appear in these alternative conceptions. A new perspective on adult cognitive development, one emphasising the impact of social context on development, has been noted as well.

The concept of wisdom in adult cognitive development has often been regarded as the hallmark of mature adult thinking (Merriam & Caffarella, 1991). Although often discussed by the great philosophers and theologians, this area of study received little attention until quite recently in the literature on learning. Representative conceptions of wisdom, such as those of Clayton (1976, 1982), Holliday and Chandler (1986), and Sternberg (1986b), were reviewed. Despite the different perspectives from which wisdom has been studied, theorists seem to agree that wisdom involves special types of experience-based knowledge and is characterised by the ability to be reflective in one's thinking and to make sound judgements in everyday life (Merriam &

Caffarella, 1991).

This concept of wisdom has been reflected in the teaching of thinking dispositions and thinking tools used in the Thinking Skills Programme as intervention in this research.

2.3.6 Conclusion

Adult learners need to learn differently. Transformative learning with the focus on critical reflection in order to change their perspective of life by changing their meaning schemes creates an operative framework to work in. The methodology of problem-solving is ideal for improving effective thinking skills in adults. It is this perspective that adults need to improve in order to create meaning in the ever changing environment. Mezirow (1991:3) describes it as follows:

> *In adulthood, rather than merely adapting to changing circumstances by more diligently applying old ways of knowing… [adults] discover a need to acquire new perspectives in order to gain a more complete understanding of changing events and a higher degree of control over their lives.*

2.4 THINKING SKILLS

2.4.1 Introduction

There was a time when society was comparatively stable and, since things did not change much, repetition was a good substitute for thinking (De Bono, 1991;Mentkowski, 2000). But in the globalised world we live in where disruptive change is the order of the day, the old power games are no longer the best way to run things. For instance, it requires quite a lot of individual thinking to change from

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the concept of growth and greed to one of restraint and stability.

In order to survive and excel in times of disruptive change as experienced in the twenty-first century, it has become imperative to think more effectively. Improving thinking in workplace settings offers potential for growth in most companies that is not commonly tapped. Part of this is learning to powerfully use the personal practical knowledge (knowledge of own experience) of the workforce, helping people to value their experience and use it effectively. The other part is providing people with explicit generative thinking skills that can be practised, shared and worked on. These two strategies can lead to workers and managers being more aware of their thinking and how to improve it, to the language of thinking being used widely, and to workers and managers feeling the power of their own thinking and performance (Edwards, 1994a; 1994c). Senge (1992:4) enforces the above by stating:

> *The organisations that will truly excel in the future will be the organizations that discover how to tap people's commitment and capacity to learn at all levels in an organization.*

The background to teaching thinking skills will be reviewed in this literature study.

2.4.2 Background to the development of teaching thinking skills

Can thinking be taught? The debates on teaching thinking have been competitive rather than cooperative (Edwards, 1991a). There have been strong proponents of higher order thinking, or critical thinking, or

logical thinking or philosophical thinking, or lateral thinking, or accelerated learning, or brain-compatible learning (Edwards, 1991a). Many are sceptical about the idea, in some cases because they regard thinking as an activity which comes naturally, like walking or talking. Others reject the idea because they see thinking as being dependent on intelligence; and believing this to be an innate quality, they doubt whether teaching can have any lasting effect on it. This view of intelligence is increasingly challenged, and even those who hold the view may accept that, with appropriate training and experience, potential can be realised more fully.

Nickerson and Zodhiates (1988:3) state: "We think without being taught to do so...It does not follow from the fact that we think spontaneously that we think as effectively as we might...the challenge is not so much to teach thinking as to teach good thinking."

Thinking involves the appropriate use of knowledge, and it should not be assumed that this concept will develop spontaneously. Thinking is an imprecise term, which includes problem-solving, decision-making, critical thinking, logical reasoning and creative thinking (Nickerson & Zodhiates, 1988:9; Rappaport, 1995). These are activities which go beyond knowledge acquisition, and there is reason to believe that current educational practice has not given adequate attention to these aspects of thinking. De Bono (1991:33) defines thinking as follows: "Thinking is the deliberate exploration of experience for a purpose. That purpose may be understanding, decision-making, planning, problem-solving, judgement, action and so on."

It is appropriate to examine the development of the reasoning whether

thinking skills can be taught to improve the cognitive ability of individuals.

The faculty of psychology on which nineteenth-century educational theory was based was discredited by Thorndike and others (Thorndike & Woodworth, 1901; Thorndike, 1901, 1906), who showed that transfer of training, as "mental discipline" was very limited. A theory of innate general intelligence dominated much of the educational practice of the first half of the mind that was largely inborn and relatively unchanging. This view is still widely held in popular thinking (OECD, 1990:203).

Developments in cognitive psychology since 1950, however, have led to a rather different interpretation of intelligence (Bruner, Goodnow & Austin, 1956; Bruner, 1960), linking reasoning to the structuring of experience, the development of schemata and the formation of concepts. Intelligence has also been closely linked to language acquisition (Chomsky, 1972; Vygotsky, 1978).

While Vygotsky and Bruner argue that it is by acquiring the means to communicate that cognitive and lingiustic processes develop, Piaget's theory of intelligence is more closely linked to neurophysiological development. Inhelder and Piaget (1964) see the functioning of intelligence as being linked to progressive stages of neural development in which cognitive structures form and reform. Progress is stimulated by the continuing engagement with environmental factors such as social interaction and communication. Anderson (1985:409) uses the metaphor of a computer to describe cognitive development. One changes either because one has a better machine or a better

program. As people get older they can potentially remember more of what has been told, make applications quicker, and recall faster. The thinking becomes better but they have also learned strategies to recall and use knowledge better. A better program has been used.

Cognitive psychology has developed these ideas (as noted by Inhelder & Piaget) extensively in recent years. New theories of intelligence have emerged, such as Gardner's "multiple intelligence" (Gardner, 1983), Sternberg's (1985a) "triarchic intelligence", and Flavell's (1976) "metacognition" are several new approaches to how thinking can be learned. In the analysis of reasoning, Sternberg (1985a) distinguishes between "executive" and "non-executive" processes, the executive processes being those which manage the operation of the others, a terminology derived from information processing.

Another field that needs to be explored in cognitive psychology is that of the philosophical approaches. In the medieval university curriculum, the study of logic was seen as training in rational thinking. The concepts of formal logic have had a profound influence on the understanding of thinking and the analysis of argument; but the skills taught in the traditional logic courses are not readily transferable to thinking about practical problems which are ill defined, unstructured and "fuzzy".

De Bono (1995:9) argues about the philosophy of thinking since the fall of the Roman Empire in AD 400. After the fall came the Dark Ages in Europe. The learning, thinking and scholarship of the Roman Empire had largely been lost. The Dark Ages ended with the Renaissance, which was triggered by the rediscovery of Classical Greek

and Roman thinking (partly through Arabic texts that had entered Europe through Spain).

The "new thinking" was a powerful breath of fresh air (De Bono, 1995:9). Humankind was given a more central position in the universe. Humankind could use logic and reason to work things out instead of having to accept everything as part of religious faith. Not surprisingly, this new thinking was eagerly embraced by the Humanists, or non-church thinkers. Even more surprisingly, this new thinking was also embraced by church thinkers. This new/old thinking became the dominant thinking of western culture and has remained so to this day (De Bono, 1995:9).

The philosophers of the past still have an influence on modern thinking and it is therefore necessary to examine the theories of these philosophers. Cognitive process training has a long history, dating at least from the ancient Greeks (Mann, 1979). Socrates never set out to be a constructive thinker (De Bono, 1995:9). His purpose was to attack and to remove "rubbish". Most of the arguments in which he was involved (as written by Plato) ended with no positive outcome at all. Socrates would show that all suggestions offered were false, but he would not then offer a better idea. Essentially he believed in argument (or dialectic) (De Bono, 1995:10). He thought that when one attacked what is wrong, one would eventually be left with the truth. This has left us with the obsession with criticism. The thinking was that it was much more important to point out what is wrong than to construct what is useful.

Plato was an Athenian patrician who, as a young man, knew Socrates

(De Bono, 1995:10). Socrates never wrote his thoughts and process down but Plato wrote up Socrates as a character in dialogues. Plato did not much believe in Athenian democracy, which he believed to be a rabble too easily swayed by populist arguments, but admired fascist Sparta. He was influenced by Pythagoras, who demonstrated ultimate truths revealed in mathematics, and who believed there were ultimate truths everywhere if only we looked hard enough to find them.

Plato reacted against the "relativism" of some of the Sophists, who believed that something was not good or bad in itself, but only in relation to a system. Plato realised that society could never be run on such a complicated basis. Plato was a fascist (De Bono, 1995:10).

From Plato came our obsession with the "truth" and the belief that we could establish it logically. This belief has been a powerful motivator of all subsequent thinking (De Bono, 1995:10).

Aristotle was a pupil of Plato and also the tutor of Alexander the Great. Aristotle tied everything together as a powerful logical system based on "boxes". These were definitions or classifications based on past experience. So whenever a person encountered something, he would have to "judge" into which box that thing fitted. If necessary, the situation would be analysed into smaller parts to see if these elements could be fitted into standard boxes. Something was either in a box or "not" in a box. It had to be one or the other and could not be anything else. From this came a powerful logic system based on "is" and "is not" and the avoidance of contradictions (De Bono, 1995:11).

In summary, from the three philosophers came a thinking system which was based on:

- Analysis
- Judgement (and boxes)
- Argument
- Criticism.

It is this thinking system that influenced the way problems were solved in the twentieth century and if analysis, criticism, judgement and argument were used, it was sufficient. However, in the twenty-first century this is not enough, as the environment is changing and is demanding more than mere analysis and critique of what is wrong. In the twenty-first century this thinking does have a place, but more is needed - we need to design and we have to be innovative and creative as well.

The need to be creative and to solve problems in a more effective way has opened the discussion on the need to be more effective in our thinking.

2.4.3 Thinking skills and a changing environment

This thinking system – analysis, criticism, judgement and argument - provided a way of thinking where we fit our new experiences into the boxes or (principles) derived from the past. This is perfectly adequate in a stable world where the future is the same as in the past - but totally inadequate in a changing world where the old boxes do not apply. Instead of judgement we need to design our way forward.

While analysis does solve a great many problems, there are other problems where the cause cannot be found, and if found, cannot be removed. Such problems will not yield to yet more analysis. There is

a need for design. We need to design a way forward, leaving the cause in place. Most of the major problems in the world will not be solved by yet more analysis. There is a need for creative design (De Bono, 1995:12; Mentkowski, 2000).

The traditional thinking system is greatly lacking in constructive energy, creative energy and design energy. Description and analysis are not enough (De Bono, 1996:12; Mentkowski, 2000; Johnson, 2000).

Having effective thinking skills will result in intelligent behaviour when one is confronted with problems and questions where the immediate answer is not known (Benderson, 1984; Adey, 1994). Managers who need to operate in the changing environment are faced with such situations where they do not have the immediate answer. They need to behave intelligently when confronted with challenging conditions that demand strategic reasoning, insightfulness, perseverance, creativity, and craftsmanship to resolve complex problems (Costa, 1985; Beyer, 1988; Cottrell, 2003).

Human beings who behave intelligently and have effective thinking skills share identifiable characteristics (Feuerstein, Rand, Hoffman & Miller, 1980; Sternberg, 1984; Ennis, 1985; Glatthorn & Baron, 1985; Perkins, 1985). These characteristics are:

a. Persistence
People demonstrate growth in thinking abilities and skills by increasing their use of alternative strategies of problem solving. They collect evidence to indicate that their problem-solving strategy is working,

and if one strategy doesn't work, they know how to back up and try another.

b. Decreasing impulsivity

When it is important to do so, people with effective thinking skills think before they act. They deliberately form a vision of a product, a plan of action, a goal, or a destination before they begin.

As adult learners become less impulsive, it can be observed that they clarify goals, planning a strategy for solving a problem. They explore alternative problem-solving strategies, and consider the consequences of the actions before they begin.

c. Listening to others with understanding and empathy

Being able to paraphrase other people's ideas; detecting indicators (cues) of their feelings or emotional states in their oral and body language (empathy); accurately expressing other people's concepts, emotions and problems are all indications of listening behaviours.

d. Cooperative thinking - social intelligence

Problem solving has become so complex that no one person can go it alone: no one has access to all the data needed to make critical decisions; no one person can consider as many alternatives as several people. But working in groups requires the ability to justify ideas and to test the feasibility of solution strategies on others.

Listening, consensus seeking, giving up an idea to work on someone else's, empathy, compassion, group leadership, knowing how to support group efforts, altruism - all are behaviours of people who have effective thinking skills.

e. Flexibility in thinking

People who use their thinking skills more effectively become more flexible in their thinking and can be heard considering, expressing, or paraphrasing another person's point of view or rationale. They can state several ways of solving the same problem and can evaluate the merits and consequences of alternative courses of action.

f. Metacognition - awareness of one's own thinking (amongst others)

By asking people to describe what goes on in their heads while they are thinking, one can determine whether they are becoming aware of their thinking (Flavell, 1985). When asked, they should be able to:

- describe what they know and what they need to know;
- describe what data are lacking and their plans for producing the data;
- describe their plan of action before they begin to solve a problem;
- list the steps and tell where they are in the sequence of a problem strategy;
- trace the pathways and blind alleys they took on the road to a problem solution (Van Zile-Tamsen, 1994).

They should also learn to apply cognitive vocabulary correctly as they describe their thinking skills and strategies, using phrases such as:

- "I have a hypothesis…"
- "My theory is …"
- "When I compare these points of view…"
- "What I need to know is…"
- "By way of summary…"
- "The assumptions on which I am working are…".

g. Striving for accuracy and precision

People with effective thinking skills have a desire for accuracy when:

- they take time to check over their answers and written deliveries;
- they review the rules by which they are to abide;
- they review the models and visions they are to follow;
- they review the criteria they are to employ, and they confirm that their finished product matches the criteria exactly.

People with effective thinking skills use correct names and when universal labels are unavailable, they use relevant analogies.

h. A sense of humour

People with effective thinking skills have the ability to perceive situations from an original and often humorous vantage point. They tend to initiate humour more often, to place greater value on having a sense of humour, to appreciate and understand others' humour, and to be verbally playful when interacting with others. They thrive on finding incongruity and have a whimsical frame of mind that is characteristic of creative problem solvers (Cornett, 1986).

i. Questioning and problem posing

People with effective thinking skills start to ask questions and pose problems themselves when they deal with situations or problems. The questions they ask are profound and specific. They ask for data to support others' conclusions and assumptions, using questions such as: "What evidence do you have?" or "How do you know that is true?" And they pose hypothetical problems characterised by "if" questions: "What do you think would happen if…" or "If that is true, then what

might happen if…?"

j. Drawing on past knowledge and applying it to new situations
Those people with effective thinking skills learn from past experiences. They abstract meaning from their experience and apply it in new situations.

k. Risk taking
People with effective thinking skills, who behave intelligently, seem to have an almost uncontrollable urge to go beyond established limits. Perkins (1985) states that creative people are uneasy with the status quo; they live on the edge of their competence. They seem compelled to place themselves in situations where they don't know what is going to happen. They accept confusion, uncertainty, risks of failure as part of the process and learn to view failure as being normal, even interesting and challenging.

l. Using all senses
People with effective thinking skills conceive and express many ways of solving problems by the use of the senses: making observations, gathering data, experimenting, manipulating, scrutinising, identifying variables, interviewing, breaking problems down into components, visualising, role playing, illustrating, or model building.

m. Ingenuity, originality, insightfulness: creativity
Human beings using effective thinking skills know how to be creative when the situation demands it. They often try to create different solutions to problems, examining alternative possibilities from many angles (lateral thinking). They need to project themselves into

different roles, starting with a vision and working backward to their solution.

Creative people are open to criticism. They hold up their products for others to judge, and seek feedback in an ever increasing effort to refine their technique (Perkins, 1985; 1986c). They constantly strive for greater fluency, elaboration, novelty, parsimony, simplicity, craftsmanship, perfection, beauty, harmony, or balance.

n. Wonderment, inquisitiveness, curiosity, and the enjoyment of problem solving - a sense of efficacy as a thinker.
People performing at their peak seem to enter another world. Time becomes distorted and a sense of euphoria prevails. They report a sense of feeling alive and fully alert.

Creative people often experience similar periods of euphoria in their work, and it may be that their unconscious internal motivation is the desire to recapture this euphoria.

These characteristics form an integral part of the Thinking Tools of De Bono which are used in the Thinking Skills Programme designed as an intervention with the middle managers in this research.

Effective thinking skills are essential in an ever-changing environment and this is especially true for the middle managers who operate in a global economy with the high demands of creating new and innovative ways of conducting business.

2.4.4 Creative thinking

Creative thinking as part of effective thinking skills is what is needed in today's world of turbulent change.

Miller (in Barron, Montuori & Barron, 1997: 27) states:

> *All geniuses are leeches, so to speak. They feed from the same source - the blood of life … there is no mystery about the origin of things. We are all part of creation, all kings, all poets, all musicians; we only have to open up, only have to discover what is already there.*

Creative thinking is patterned in a way that tends to lead to creative results. This definition reminds us that the ultimate criterion of creativity is output (Perkins, 1985:18). Mullis (Nobel Prize winner) (in Rabino, 1996: 6-7) explains creativity as follows:

> *In a sense, I put together elements that were already there, but that is what inventors always do. You can't make up new elements, usually. The new element, if any, it was the combination, the way they were used.*

There is no obvious reason that creative results should depend on a single trait like ideational fluency. The pattern of creative thinking is not simple and neat - not just a matter, for instance, of generating ideas and selecting among them. Rather, the pattern involves a number of components that contribute to the creative outcome. These components can be categorised according to six general principles of creative thinking (Perkins, 1985:19; Sternberg, 1986c).

1. Creative thinking involves aesthetic as much as practical standards. Creative results do not just bubble up from some fecund swamp in the mind. Creative individuals tend to value stated qualities and try quite straightforwardly to achieve them.

Various studies have identified similar explicit commitments in creative scientists (Roe, 1952; Pelz & Andrews, 1966; Mansfield & Busse, 1981; Perkins, 1981).

2. Creative thinking depends on attention to purpose as much as results. Experts perceive problems in terms of possible solution paradigms, whereas novices perceive the same problems in terms of superficial features (Larkin, McDermott, Simon & Simon, 1980; Chi, Feltovich & Glaser, 1981; Schoenfeld & Herrmann, 1982; Larkin, 1983).

3. Creative thinking depends on mobility more than fluency. Clement (1982; 1983) has documented the role of analogy in the skilled solving of maths and physics problems. Working backwards from answer to solution is a widespread tactic in skilled problem solving (Newell & Simon, 1972). Reformulating a problem in various ways is one tactic used in Schoenfeld's successful demonstrations of teaching mathematical problem solving (Schoenfeld, 1982; Schoenfeld & Herrmann, 1982).

4. Creative thinking depends on working at the edge more than at the centre of one's competence. Creative people maintain high standards, accept confusion, uncertainty, and the higher risk of failure as part of the processes, and learn to view failure as normal, even interesting, and challenging (Perkins, 1985:21; Sutton, 2002).

5. Creative thinking depends as much on being objective as on being subjective. Creative people consider different viewpoints, set final or intermediate products aside and come back to them later so that they can evaluate them with more distance, seek

intelligent criticism, and subject their ideas to practical and theoretical tests (Perkins, 1985:22; Borowski, Carr & Pressely, 1987).

6. Creative thinking depends on intrinsic, more than extrinsic motivation. Creative people feel that they, rather than other people or chance, choose what to do and how to do it (Perkins, 1985:22). Numerous studies discussed by Amabile (1983) argue the importance of intrinsic motivation.

In summary, it seems reasonable to say that the more these six principles guide one's thinking, the more creative it will be (Perkins, 1985:22).

If this traditional system of thinking mentioned earlier, is indeed so limited, then how is it that Western culture has made such tremendous progress in science and technology?

Plato's search for the truth has been a prime motivating factor. Aristotle's classification has also helped. Socratic questioning and attack has played a part. But by far the most important factor has been the possibility system. This is an immensely important part of thinking. The possibility system gives hypotheses in science and visions in technology. That is what has driven Western achievement (De Bono, 1996:12). Chinese culture, which was far ahead of Western technical culture two thousand years ago, came to a halt because the Chinese moved into description and never developed the possibility system.

Argument is a rather poor way of exploring a subject because each

side soon becomes interested only in winning the argument rather than in exploring the subject. At best there might be a synthesis of thesis (one side) with antithesis (the other side) to give a synthesis, but this is only possible among many which would otherwise have been designed.

Western civilisation has a thinking system which is excellent as far as it goes, but inadequate for the following reasons (De Bono, 1996:13):

- It does not adequately deal with "perception" which is by far the most important of thinking in everyday affairs.
- Argument is a poor way of exploring a subject and sets up unnecessary adversarial positions.
- The "boxes" derived from the past may not be adequate to deal with a changing world, which is different from that of the past.
- Analysis is insufficient to solve all problems. There is a need to supplement it with design.
- The notion that criticism is enough and that somehow useful progress will be made is absurd.
- There is insufficient attention to the generative, productive, constructive and creative aspects of thinking.
- The huge importance of the possibility system is largely ignored.

It is important to emphasise that the traditional system has value, excellence and its proper place. The danger lies in assuming that it is sufficient and allowing the system to dominate all our intellectual effort (De Bono, 1996:13).

The changing environment in which adults operate asks for creative thinking to design the future. To use creative thinking, one needs

effective thinking skills and should be able to act in a thinking disposition. Thinking tools to develop creative thinking and more effective thinking are needed to train these thinking skills. The thinking tools and the theory of thinking dispositions will be covered in the literature review.

2.4.5 Teaching adults thinking skills

In the twentieth century, in the field of educational philosophy, Dewey's writings made an early and significant contribution to the analysis of thinking and the implications for teaching it. Dewey's analysis of reflective thinking (summarised by Cuban, 1984: 664), comprising four steps (1. identify the problem, 2. generate hypotheses, 3. refine a hypothesis, 4. test the hypothesis) was the first of many attempts to analyse the reasoning process into a sequence of steps.

Philosophical interest in thinking as an educational objective was stimulated by a seminal paper by Ennis in 1962 on the concept of critical thinking. Ennis (1962) describes critical thinking as "reasonable reflective thinking that is focused on deciding what to believe or do" (Baron & Sternberg, 1987:10). Critical thinking, as described by De Bono (1988:12) is to debate, to argue and to spot the error in reasoning. Critical thinking is re-active; it lacks the creative, constructive and design elements for social progress.

A third category of influences that has shaped ideas about thinking is associated with computers, programming, information processing and artificial intelligence. The task of designing and procedures for information processing and retrieval has necessarily drawn upon our

knowledge of human mental processes for doing these things; and though there are (probably) basic differences, the rapid growth in sophistication of computers has resulted in a stimulus to the study of similarities between human thinking and machine "thinking" or artificial intelligence.

A second strand within this category is the writing of computer programs explicitly to make students think or to train them in thinking by giving them guided practice. However, Perkins and Salomon (1988:24), quoting reviews by Clements (1985) and Dalbey and Linn (1985), conclude that the "track record of efforts to enhance cognitive skills via programming is discouraging. Most findings have been negative".

As noted earlier, the changing context and environment in which individuals operate call for a new range of cognitive skills to meet the demands. Whilst memorising, translating and calculating are still important capacities, the need is widely recognised for the "basics" to be redefined in terms of higher-order thinking skills. Resnick (1987:7) emphasises it by saying: "It is a new challenge to develop educational programmes that assume that all individuals, not just an elite, can become competent thinkers."

The extensive range of development produced a wide variety of methods in, and approaches to, the teaching of thinking. Those who adopt a "skills" approach identify component skills in thinking, and practise these skills through exercises which are usually "content-free" or not closely linked with any subject discipline. A contrasting view is held by those who argue for "infusion", on the grounds that the

process of thinking is inseparable from the content (Feuerstein *et al*. 1980).

The two approaches are discussed to determine the difference between them:

The Skills Approach: If there are skills involved in thinking, independent of specific content, then the idea of training people in these is at least worth considering. Examples of such generalised skills might include: looking for evidence, using analogies, quantifying as percentages for comparisons of unequals, stopping to think, seeking counter arguments and being suspicious of evidence which confirms your strongly held prejudices (Bransford & Stein, 1984)

The skills approach is criticised by Sternberg (in Baron & Sternberg, 1987:253) under a heading: "Is having the right thought processes tantamount to being a good thinker?"   He asserts that the answer to this question is a resounding "No". Also required (as many of those he criticises would agree) are: knowing how to combine skills into workable strategies for solving problems; effective mental representations, to be able to see both sides of a case; a knowledge base, since thinking must be performed in the context of knowledge; and motivation to use the skills learnt (Glaser, 1984).

Infusion process 1: Problem-solved teaching and learning: Mathematicians for many years have used the teaching method of setting problems for students to solve. Since the ability to solve mathematical problems is a relevant area of competence in the subject, practice in problem solving is an acceptable activity

(Schoenfeld, 1982). Students benefit from guidance in how to go about finding solutions. It is certainly not merely enough to tell them the solution: they have to apply the recommended procedures to other new examples. Can such thinking become generisable beyond the bounds of mathematics?

While this style of approach commands wide support among educational writers, the crucial question is how to ensure that specific skills and strategies are applied more generally (Baron & Sternberg, 1987).

Infusion approach 2: Study of the humanities: Methods of teaching thinking through philosophy are reviewed in the publications by Lipman (1994); Lipman, Sharp and Oscanyan (1980) (Philosophy for Children) and Paul (1987) (Dialogical Thinking and Socratic Questioning). For example, Lipman's first novel, *Harry Stottlemeier's Discovery*, introduces Aristotle's class logic, transitivity and symmetry, and propositional logic, in the context of a children's story. Paul extends his methods of teaching critical thinking into other fields such as social studies by "critical-thinking writing –prompts". This focuses attention on issues and judgements (Paul, 1987; 2001).

The strength of the approach through the humanities is that it recognises the importance of uniquely human capacities such as motivation and emotion (Greene, 1989).

Infusion approach 3: Information technology and computers: This "mechanical" criticism readily springs to mind when turned to the contribution of information technology and computers. If done self-

consciously with the aim of developing thinking, this approach can promote the same "infusion" as the other approaches (Papert, 1971; 1980). Here again, transfer is crucial (Perkins & Salomon, 1989). The crossword puzzle may enlarge our vocabulary, or it may be only an artificial diversion with its own highly specific, non-transferable, "useless" skills.

To be effective in the teaching of thinking skills one must use a range of methods. Glaser (1984: 101) concludes:

> *The pedagogical implication that follows from this is that an effective strategy for instruction involves a kind of interrogation and confrontation. Expert teachers do this effectively, employing case method approaches, discovery methods and various forms of Socratic inquiry dialogue… Such interactive inquiry methods are powerful tools for teaching thinking in the context of subject matter.*

The role of the teacher/trainer is very important in the effective teaching of thinking skills. The role of the teacher must be one of a facilitator, as a mediator of experience. Rogers (1969; 1983) supports this strongly when he explains that in his view teaching and the imparting of knowledge make sense in an unchanging environment, which is why it has been an unquestioned function for centuries. "But if there is one truth about modern man, it is that he lives in an environment that is continually changing" The aim of education must therefore be the facilitation of learning and the role of the teacher as the facilitator of learning. The critical element in performing this role is the personal relationship between the facilitator and the learner (adult), which in turn is dependent on the facilitator's possessing three attitudinal qualities: (1) realness or genuineness, (2) nonpossesive

caring, prizing, trust and respect, and (3) empathic understanding and sensitive and accurate listening (Rogers, 1969:106-126; Rogers, 1983; Werner, 1988).

As important as the role of the facilitator to ensure effective transfer of thinking skills, is the recognition that attitudes and motivation play an important part in thinking. Resnick (1987: 41) refers to this as:

> The term disposition should not be taken to imply a biological or inherited trait. As used here, it is more akin to a habit of thought, one that can be learned, and therefore taught. Engaging in higher order thinking with others seems likely to teach students that they have the ability, the permission, and even the obligation to engage in a kind of critical analysis.

This aspect is stressed as well by others who review the field (Paul in Baron & Sternberg, 1987:141-142; Nickerson & Zodhiates, 1988:25-27). Garner (1990:45) suggests that high self-esteem and an internal locus of control are needed.

There is a current belief among many that gut feeling is what really matters and that thinking is "just messing around with words" (De Bono, 1996: 12). This is based on the experience that so-called logical thinking can be used to prove any point of view. Ultimately it must be feeling that matters most (De Bono, 1996:13). Feeling is what makes a human being human. In the end it is to satisfy our emotions and values that we arrange our actions. It is this very importance of feeling that makes thinking so necessary. The purpose of thinking is to prepare something to feel about. Thinking arranges and rearranges perception and experience so that one may have a clearer view of

things. Without thinking feeling is a tyranny (De Bono, 1996:13). Thinking should never attempt to direct feeling or to be a substitute for feeling. Thinking must clarify perception. Feeling is then the reaction to this clearer perception.

Descartes's remark (in De Bono, 1996:43): "I think therefore I am", is true in a psychological sense as well as in a metaphysical one. We are our thoughts. With our thoughts we can watch all things and watch ourselves. It is hardly surprising that the ego and thinking are almost inextricably intertwined. One of the main purposes of teaching thinking is to try to break this deadlock and get the adult to look objectively at his/her thinking, much as a tennis player might look objectively at the performance of his/her backhand in a match.

The self-image continues to include the need to be right all the time and it becomes almost impossible to develop objectivity about thinking (Merriam & Caffarella, 1991:199; De Bono, 1996:44). Objectivity about thinking has impact on wisdom. The thinker who is wise is especially able to make clear, sensible, and fair judgements and is perceived to profit from the experience of others and learn from others' mistakes, as well as from his or her own (Sternberg, 1986b). The wise thinker does not focus on his ego (what he knows and how intelligent he or she is) to think about problems or make decisions. The ego problem is a very difficult one to overcome in the teaching of thinking. Much depends on the facilitator. The method is to try to separate thinking as a deliberate and even artificial skill from the ordinary thinking activity of the ego (De Bono, 1996:44).

All too commonly, people know how to think better about something

(for instance, to search for more options, consider further evidence, or look at the other side of the case) but are not disposed to do so for one reason or another (for instance, bias, prejudice, impatience, overconfidence, or simply a failure to notice that the situation invites broader and/or more careful thinking) (Perkins, 1992; Perkins, Jay & Tishman, 1993:2). Perkins *et al.* (1993:3) argue a theory of thinking that emphasises the role of dispositions. In contrast with prior dispositional perspectives, this theory restructures the concept of dispositions into "triadic dispositions", which include inclinations, sensitivities, and abilities. It also introduces a small set of seven "master" dispositions that encompass all or most of what good thinking involves.

It would be easy to see dispositions mainly as an effort to honour the role of motivation in complex cognition, and clearly this is one of the objectives. However, Perkins *et al.* (1993:5) propose a conception of dispositions that includes attention to habits, perceptual sensitivities, and even abilities. This conception puts forth dispositions as a unit of analysis for a broad and fruitful conception of mind.

Perkins *et al.* (1993:6) characterise good thinking as reflecting seven broad thinking dispositions: exhaustively, from a normative standpoint; approximately, from a descriptive standpoint. These dispositions are:

1. to be broad and adventurous;
2. towards sustained intellectual curiosity;
3. to clarify and seek understanding;
4. to be planful and strategic;
5. to be intellectually careful;

6. to seek and evaluate reasons;

7. to be metacognitive.

Seen from a dispositional perspective, efforts to teach thinking invite a broader and different pattern of emphasis than one usually finds. A dispositional perspective on thinking offers much both to theory and practice. Yet it has to be acknowledged that the notion of dispositions has its problems as a theoretical construct. The concept of dispositions is considered "messy", because it invokes a vague assortment of ill-defined or immeasurable behavioural influences (Perkins *et al*. 1993:18). Dispositions do inevitably include reference to things that are genuinely hard to pin down: motivation, affect, sensitivities, values and the like. But Perkins *et al*. (1993:18) argue that these factors must figure prominently in a full account of good thinking. They have given such an account: a dispositional theory of thinking that honours the motivational, perceptual and affective dimensions of behaviour, and that makes generative connections to both extant research and contemporary education.

The researcher argues for the use of dispositions in teaching effective thinking skills for adults with the combination of specific thinking tools as designed by Edward De Bono (1988). The perceptions and values of adults need to be addressed in order to develop their thinking, to teach them to use thinking tools to think more effectively.

De Bono's CoRT (Cognitive Research Trust) Thinking Lessons Programme for teaching effective thinking skills is the most widely used programme in the world for the direct teaching of thinking skills (De Bono, 1988; Edwards, 1991b; Sternberg, 1999; De Bono, 2000).

Exactly the same lessons are used by ten-year-olds in the middle of the Venezuelan jungle as are used by gifted students in Canada and executives in business (De Bono, 1988; Sternberg, 1999; De Bono, 2000). This is worth mentioning for several reasons. The basic thinking skills are fundamental enough to cut across age, ability and cultures. It is possible to devise simple and usable frameworks for the practice and development of thinking skills. It is possible to pay direct attention to thinking as a skill. The skills and tools approach are effective teaching methods of thinking skills for adults as they are orientated towards a process of practicality. They need practical tools to apply their thinking skills in a work environment.

The methodology is quite simple. It is based on "tools" and "awareness". The tools are deliberately strange-sounding, with initials such as PMI or CAF. This is to make them tangible and usable in a deliberate fashion (De Bono, 1988:16). They are attention directors. A person can set out to "do a PMI". The tools are practised on a wide range of situations. Each of these is only considered for a very short burst of time: two to four minutes. Then the thinker applies the tool to another matter. This to ensure that attention stays on the tool rather than on the content. The big problem with teaching thinking has always been the lack of transfer (De Bono, 1988; Costa & Kallick, 2000). With the "tool method" the skill is embedded in the tool. The process is neither inductive nor deductive but it is "operative". The other element in the course is "awareness". This is a matter of insight, realisation, and understanding of what goes on in thinking. "If we get to understand the 'landscape' of thinking it becomes easier to find your way around. The tools are the means with which one gets around" (De Bono, 1988:16; Sternberg, 1999).

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The CoRT thinking tools teach two distinct aspects of perception: breadth and change. To design tools for perception one must understand the process. Perception involves a self-organising, active information system. Breadth means that the learners look more widely, more deeply - they try to see more of the road map and more details on it. Perception is what is needed to teach adults to change and improve their thinking processes in a changing environment. Many of the CoRT tools are designed to direct the attention towards creating a broader conceptual map. The CoRT 1 thinking process was applied as it teaches the fundamental use of the attention directing tools. It emphasis the right use of the tools to teach lateral thinking.

Change means that the learner tries to see something in a different way. The glass of water is not half empty, but half full. This is the creative aspect of perception; this is lateral thinking. The CoRT method divides thinking into two stages. In the first stage thinkers make a perceptual map. In the second stage they use the map to mentally find their way about.

When a thinker has changed and broadened his or her perceptions and has begun to use lateral thinking to solve problems, he or she obviously needs the critical or evaluative aspect of thinking. CoRT deals directly with this need, by including lessons on such topics as evidence, ways of being right or wrong, and the use of analysis and selection. CoRT operates in the metacognitive information process. Metacognition enables learners to benefit from instruction (Carr, Kurtz, Schneider, Turner & Borkowski, 1989; Van Zile-Tamsen, 1996) and influences the use and maintenance of cognitive strategies. While

there are several approaches to metacognitive instruction, the most effective involve providing the learner (adult) with both knowledge of cognitive processes and strategies (to be used as metacognitive knowledge), and experience or practice in using both cognitive and metacognitive strategies and evaluating the outcomes of their efforts (develops metacognitive regulation). The important point is that these are not sufficient in themselves but are part of a broader set of skills (De Bono, 1988; Sternberg, 1988).

2.4.6 Conclusion

Thinking skills can be taught through a programme that is set in the content of the managerial role in an organisation and focuses on the transfer of the thinking skills. The CoRT thinking skills programme is such a programme and it is therefore used in the Thinking Skills Programme designed by the researcher.

Creative thinking and thinking dispositions are also important to ensure the transfer of thinking skills. The thinking dispositions theory explained by Perkins *et al*. (1993) will be included in the training programme to ensure the motivation and attitudinal aspect of teaching thinking skills.

The managers in this research operate in a complex and ambiguous environment and need to have more effective thinking skills in order to design the future and not merely to react to the changes and demands of globalisation and the New Economy.

2.5 CONCLUSIONS

Environmental forces forced most companies not merely to adjust or

adapt as they had in the past, but to confront the need for major transformational change (Ghoshal & Bartlett, 1997:9). In a global, high tech world, organisations need to be more fluid, inclusive and responsive. They need to manage change and complex information flows, grasp new ideas quickly, and spread those ideas throughout the enterprise. What counts is whether people quickly absorb the impact of information and responds to information (Ghoshal & Bartlett, 1997:10; Kanter, 1995:2).

It is change that forces the need for more effective thinking. The middle managers in an organisation need thinking skills to think more effectively in order to manage in a changing society. Managers are adult learners in a changing society. Rather than merely adapting to changing circumstances by simply diligently applying old ways of knowing, effective managers discover a need to acquire new perspectives in order to gain a more complete understanding of changing events and a higher degree of control over their lives (Mezirow, 1997:3). Being more effective thinkers will enable them to gain this control. The teaching of thinking skills will help the adult learners (managers) to change their "meaning schemes (specific beliefs, attitudes, and emotional reactions)". This will prompt them to engage in critical reflection on their experiences, which in turn leads to a perspective transformation (Mezirow, 1991:167).

The following diagram will explain why the adult learner (manager) in a changing environment or society needs thinking skills to manage and control these changes. The environment of turbulent change impacts on the adult learner as manager operating in this environment and the need to think more effectively arises.

Figure 1.1:   Interaction of change, the adult learner and thinking skills
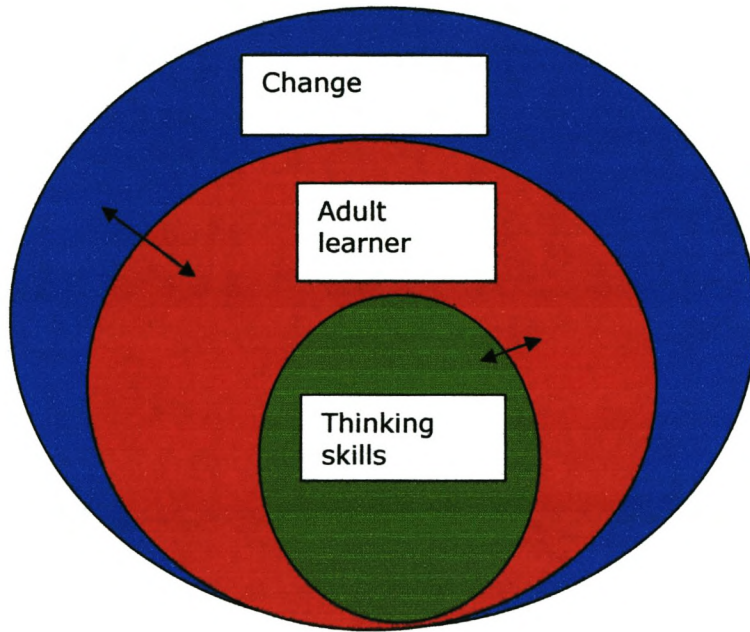
CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

This chapter describes the research design and methodology and procedures employed for the design and evaluation of a thinking skills programme for middle managers in an environment that is influenced by turbulent change. The evaluation research will utilise qualitative

methodology to evaluate the transfer of effective thinking skills in an organisational environment over a period of time. The following will be discussed: research design (purpose and type of evaluation; phases of the research), research methodology (participants; procedure during the study; methods of data collection; methods of qualitative data analysis) and validity and reliability of the research.

3.2 RESEARCH DESIGN

As discussed in Chapter One, the design of this study is evaluative in nature.

Programme evaluation entails the use of scientific methods to measure the implementation and outcome of programmes for decision-making purposes (Rutman, 1984:10). Programme evaluation refers to any intervention or set of procedures mounted to achieve external objectivity to meet some recognised social needs to address an identified problem (Rutman, 1984:10). Rossi and Freeman (1993:5) define programme evaluation research as: "…the systematic approach to social research procedures for assessment, conceptualization, design, implementation and utility of social intervention programme".

In embarking on the research, it was decided to evaluate the improvement, if any, that was brought about by the intervention.
Social interventions (such as programmes, policies, new systems, schemes) are evaluated for a number of reasons. Patton (1997:76) summarises the purpose as three-fold: to judge merit or worth; to improve programmes; and to generate knowledge. The purpose of this research is an improvement-orientated evaluation (Babbie & Mouton, 1998:338).

The different forms of improvement-orientated evaluations - formative evaluation, quality enhancement, responsive evaluation, empowerment evaluation – share a concern with improving the programme. Such evaluations ask different questions: What are the programme's strengths and weaknesses? Has the programme been properly implemented? What constraints are there on proper implementation? Are the programme recipients responding positively to the intervention? If not, why not? These questions were asked throughout the implementation of the programme to ensure that the participants who participated in the Thinking Skills Programme had learned the required skills and that transfer of learning had taken place. Improvements such as the use of real life problems they encountered on a daily basis were used as part of the training.

Formative evaluation was utilised as an important tool to determine the success or otherwise of the intervention. Formative evaluation – and other forms of improvement orientated evaluations – typically involves collecting data for specific periods of time during the start-up phases of the intervention, in order to make suggestions about improvement, to solve unanticipated problems and to make sure that participants are making the required progress towards the desired outcomes (Babbie & Mouton, 1998:339).

Babbie and Mouton (1998:341) point out that once it has been established that a programme has been implemented according to plan or not according to plan, attention shifts to the intended (and unintended) outcomes of such a programme These outcomes could entail behavioural changes, attitudinal changes, and better services. In all of these cases, the evaluator must assess what the particular

(intended) outcomes of the programme are and come up with reliable and valid measures of such outcomes (Mouton & Muller, 1995; Babbie & Mouton, 1998:341; Mouton, 2001:160). In this programme the intended outcomes are that:

- the participants will be aware of their thinking processes;
- the participants will understand that they can develop their thinking ability to become effective thinkers;
- the participants will have thinking dispositions and use thinking tools to help them to transfer their learning in order to become effective thinkers;
- the participants will change in the way they manage conflict in the business, think strategically, solve problems, and make decisions; and
- the participants will be aware to apply creative thinking in the workplace.

The reliable and valid measures that were used included pre- and post-assessment questionnaires with open-ended questions, observations, and semi-structured interviews. Triangulation was used to ensure validity and reliability.

3.3 RESEARCH METHODOLOGY

3.3.1 Phases of the research

The phases of the research will be discussed and the summarised process is illustrated in the figure below.

Figure 3.1:   Phases during study

Phase 1: Proposal		Phase 2: Pre-assessment & Thinking Styles Questionnaire		Phase 3: Intervention Thinking Skills Programme		Phase 4: Post-assessment
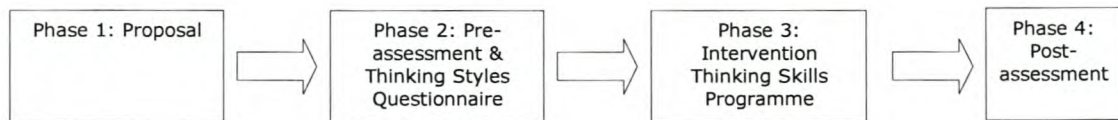
The research consisted of four phases. The *first phase* or proactive evaluation takes place before a programme is designed (Owen & Rogers, 1999:41). The orientation was the design of a proposal, which was submitted, to the executive management team of the business unit where the planned intervention would be executed. This was an important phase as the buy-in and support of the executive management team for the execution of the intervention was necessary so that time could be allocated for the delivery of the intervention during business hours. A thorough literature review and analysis of the business environment in which the participants operated resulted in a documented synthesis of the outcomes that could be expected in managers who are effective thinkers (Owen & Rogers, 1999).

It was also important to get the support of the middle managers, as they needed to understand that it was important for them to develop this conceptual competency. This is the clarifying form of the programme evaluation (Owen & Rogers, 1999:42). They needed to know that their seniors viewed the intervention as important for effective management in a changing environment (Owen & Rogers, 1999). Middle managers, as adults, will only support an intervention if they believe the importance of learning more effective thinking skills to

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be a necessity in their day-to-day activities as managers. They understood that they would benefit from the evaluation of the programme to identify elements that worked well and would highlight those areas that required change or improvement (Owen & Rogers, 1999).

The *second phase*, or monitoring evaluation, is appropriate when the programme is running (Owen & Rogers, 1999:46) and consisted of designing pre- and post-assessment questionnaires (Addenda A and B) to evaluate the thinking skills of managers in solving problems, making decisions, being creative and thinking strategically. The questions in the questionnaires were derived from findings in the literature review on teaching adults thinking skills as well from the need identified in the business environment by the stakeholders (Owen & Rogers, 1999).

The standard evaluation design that addresses questions such as this is the pre-assessment - post-assessment design. This design was used to establish whether the participants had improved while being served by the Thinking Skills Programme (Babbie & Mouton, 1998: 338). The table below explains the standard evaluation design of the research study.

Table 3. 1: Standard evaluation design of research study

Type of design	Questions that can be answered
Pre-assessment - Post-test design **O X O** [Standard notation adopted by Campbell and Stanley (1963) whereby a programme is symbolised as X and an observation or measurement by O]	How well were the participants doing before the programme? How well are the participants doing at the end of the programme? Are the minimum levels of outcomes being obtained? How much did participants change during their participation in the programme?

It was also important for the facilitator in the research study to evaluate the thinking styles of the participating middle managers as participants that would influence the facilitation of the thinking skills programme. An existing thinking styles questionnaire (Addendum C) that had been used extensively with good results had to be chosen. The **STERNBERG QUESTIONNAIRE on THINKING STYLES** (Sternberg, 1999:27-75) was conducted before the first session (see Addendum C). This was done to determine the thinking styles of the participants. Information gathered from the questionnaire gave the researcher an indication of the styles of participants and the opportunity to facilitate the session to accommodate the different styles. It also served the purpose of giving the participants more insight into their own thinking and alerted them to the need to improve their thinking skills (Tishman & Jay, 1993:3; De Bono, 1996:44; Sternberg, 1999:19). The thinking styles questionnaire (Sternberg, 1999) was not conducted after the intervention, as the purpose of this research was not to assess the change in thinking styles of the participants.

The data from the pre-assessment questionnaire were collected prior to the intervention, and those of the post-assessment questionnaire six months after the intervention had been completed. The intervention was conducted in four sessions of two hours each. This was designed to accommodate the workload and time constraints of the participants. The sessions were conducted in the workplace and intact groups attended the sessions. They work together in the workplace and they were confronted with the same problems and decisions they had to make in the workplace. The time lapses between the training sessions gave the researcher optimal time to observe the participants operating in their environment. In education, an overall aim is to change the participant's knowledge, attitudes and behaviour (Knowles, 1990; Lidz, 1991). The observations helped the researcher to encourage the participants in the workplace to use the tools they had learned in the training sessions to change their behaviour and enhance their knowledge of how to act, using more effective thinking skills. This formed part of monitoring evaluation (Owen & Rogers, 1999).

The *third phase,* interactive evaluation, provided information about the delivery of the intervention (Owen & Rogers, 1999:44). The intervention was implemented in the business unit. The intervention was a thinking skills programme for middle managers (Addendum H). This was implemented after the pre-assessment and thinking styles questionnaire had been completed with the participants. The training programme was done over a period of two months and was conducted in four sessions of two hours each. The time between the training sessions was spent on observing the participants in the work environment and on conducting semi-structured interviews with

randomly selected participants in order to obtain information on the transfer of the thinking skills and to make changes to the programme to meet the needs of the participants so that optimal learning in adult learners (managers) could be ensured (Kirkpatrick, 1998). It formed part of monitoring evaluation and was used in the triangulation process (Owen & Rogers, 1999).

The *fourth phase* was impact evaluation and it was used to assess the impact of the intervention on the participants taking part in the intervention (Owen & Rogers, 1999:47). The application of the post-assessment thinking skills questionnaire (Addendum B) had to assess the thinking skills of the participants who had been exposed to the Thinking Skills Programme. The pre- and post-assessment questionnaires would indicate whether there had been transfer of learning of the thinking skills (Kirkpatrick, 1998). Thorndike's analysis (in Perkins & Salomon, 1989) suggests that transfer depends on identical elements in the material learned and the situation it is applied to; he recommended that the teaching should be for transfer by emphasising the commonality of elements in situations and the potential applications of knowledge. Perkins *et al*. (1989) identify two distinct mechanisms for transfer, namely high-road and low-road transfer. Low-road transfer occurs as an "automatic triggering of well-rehearsed schemata" and high-road transfer is more a conscious choice of action. The researcher observed the participants in their work environment (monitoring evaluation) during the period in which the intervention was conducted. The observations were carefully noted and feedback was given in the next session. The problems presented in the work session were business-related according to the observations made.

After the second intervention (a two-hour session) the researcher conducted semi-structured interviews (Addendum F) which formed part of the monitoring evaluation with half of the participants selected at random by allocating numbers to the alphabetical list of participants and selecting the even numbers only. The time allocated for the interview was 15 minutes for each interview.

The study was conducted over a period of six months, February 2000 to August 2000. The pre-assessment questionnaire was implemented before the intervention to gather baseline data. Semi-structured interviews and observation served as mid-assessment during the sessions, to note any changes in the application of their thinking skills, and six months later the post-assessment was conducted with an open-ended questionnaire (post-assessment questionnaire). The post-assessment questionnaire asked the same questions as had been asked in the pre-assessment phase with the addition of specific questions on day-to-day activities, relationships and an overall question on how they had experienced the programme. The day-to-day activities and relationship questions were added as a result of observations made by the researcher in the workplace on difficulties the participants experienced on a day-to-day level. Lidz (1991:7) suggests that research in cognitive processes should focus on the processes over a period of time. It is useful to evaluate later and determine whether behavioural changes have been sustained (Kirkpatrick, 1998).

3.3.2 The participants (Adult learners)
Against the background of the design of this study, purposeful sampling was employed, taking into consideration that the objective of

the research was to discover, understand, and gain insight. The researcher therefore had to select a worthwhile sample, in other words, selecting informants who would both answer the research question and from which the most can be learned (Miles & Huberman, 1984:27; Patton, 1986:100, 205; Babbie, 1998; Cresswell, 1994:148; Merriam, 1998:48, 60; Mouton et al., 2000:34). The participants were a group of middle managers in an organisation in the South African economic environment that is listed on the FTSE 100 (London Stock Exchange - 100 best companies listed on the London Stock Exchange). The identified selected group of managers consists of 30 managers operating in a similar environment in the organisation.

These managers had to operate in a changing environment without the necessary training to do so. Almost all the managers had become managers by moving "through the ranks" and most of them had no formal academic background, but only good experience in the organisation.

These managers were exposed to new order thinking, as they needed to solve problems on a wider scale. In the past they had to deal with problems related only to policy-holders and their direct subordinates, but since the company had demutualised, they had to deal with the policy holder as a shareholder as well as with other shareholders in the company. The results of the company would in future be measured along international standards and not in terms of the national (South African) business environment. The organisation had become part of the global economy overnight with a different focus and higher standards of productivity and management of processes to gain bigger market share and generate more monetary value for the international

company. The group of middle managers were immediately exposed to a different environment and they had to cope with intensive change. The demands to perform were high and ongoing. As a result of these changes, the managers needed to enhance their thinking ability and to think differently on more strategic levels and in a global environment.

It was this need that encouraged the researcher to implement a learning intervention to improve the thinking skills and thinking disposition of the managers, as stated in Chapter One.

3.3.3 Methods of data collection

Regarding qualitative data collection methods the qualitative researcher's ability to gather data from the inside through a process of attentativeness and empathetic understanding, while suspending preconceptions about the topics under discussion, is important. The aim is to gain insight into the meaning that participants give to experience brought about by participating in the programme.

Qualitative data collection methods can provide a broader version of theory than simply a relationship between variables. The researcher is an important research instrument, who as a participator, gives her perceptions of the context and is responsive to the context (Miles & Huberman, 1984:10; Merriam, 1988:16-19; Silverman, 1993:27).

3.3.3.1 Literature review

In compiling a literature review, the researcher explores the literature to establish the status quo, and formulate a problem or research inquiry. It defends the value of pursuing the line of enquiry established, and compares the findings and ideas with the researcher's

own. Ultimately the literature review involves the synthesis of the work of others in a form which demonstrates the accomplishment of the exploratory process (Bruce, 1994:5-37).

The focus of the literature review in this study was on organisational changes that influence the operating environment of the participants as adult learners. It was important to review, in the literature, a view on adult learning and adult cognitive development within the environment. Information on the progress made in assessing cognitive development and the teaching of thinking skills to adults was important in defending the line of enquiry.

3.3.3.2 Questionnaires

Open-ended questionnaires (Addenda A and B) were designed to assess certain aspects of the target groups' thinking skills. The questionnaires were used as a pre-assessment tool before the intervention and also as a post-assessment tool after the intervention.

The aim of the study was to assess whether cognitive development had taken place in the behaviour of the participants after the intervention. It was therefore necessary to focus on the assessment of qualitative data that would reinforce the development of cognitive development.

The qualitative approach towards assessing cognitive development processes is Dynamic Assessment, which is defined by Lidz (1991:6) as follows:

> … *we can define dynamic assessment as an approach that follows a test-intervene-retest format, and that focuses on*

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learner modifiability and on producing suggestions for interventions that appear successful in facilitating improved learner performance. Dynamic assessment also provides information regarding functional and dysfunctional meta cognitive processes, as well as regarding intensity of interventions involved in producing change.

The terms "learning potential" and "dynamic assessment" have been used interchangeably to indicate the model of assessment used. Both Budoff (in Lidz, 1991:3) and Feuerstein (in Lidz, 1991:3) have used the term "learning potential", and Feuerstein (in Lidz, 1991:3) offers "Dynamic Assessment" in his classic text describing his procedure. "Dynamic Assessment" has been selected as term of choice, since it describes the nature of the assessment procedure, rather than suggesting an examinee's outcome in a way that many find controversial and questionable (Lidz, 1991:3).

Dynamic assessment is typically contrasted with static assessment. This reflects the fact that dynamic assessment focuses on learning processes, in contrast with the traditional assessment focus on already learnt products.

Although there are variations in the interpretation of the dynamic assessment model, there are certain core criteria that define this approach. First is a test–intervene-retest format. The specialist first administers a static pre-assessment to establish a level of performance, and then provides interventions to try to produce changes in the examinee, and then a re-test on the static test in order to assess degree and nature of change; the change is interpreted in

terms of response to the intervention.

A second definitive characteristic of a dynamic assessment is the focus on learner modifiability. "Modifiability" involves both the amount of change made by the learner in response to the intervention provided, and the learner's increased implementation of relevant meta-cognitive processes in problem solution. However, failure to change during the course of the assessment may reflect either the resistance of the learner or the inadequacy of the intervention (Lidz, 1991:4). Thinking tools were introduced in the intervention to help the participants to transfer their learning in the Thinking Skills Programme to the real-life environment they need to operate in. The thinking tools would help to support them to modify their thinking in operating in the environment. De Bono (1988:16) states:

> The big problem with teaching thinking has always been the lack of transfer. With the 'tool method' the skills are embedded in the tool. The process is neither inductive nor deductive but it is 'operative'. The other element of the course is 'awareness'. This is a matter of insight, realisation, understanding of what goes on in thinking. If we get to understand the 'landscape' of thinking it becomes easier to find our way around. The tools are the means with which we get around.

The third characteristic of dynamic assessment is that it provides useful information for developing interventions. There is a great deal of pressure on the assessor to analyse the learner's needs and then to devise a means of response (Lidz, 1991:4).

Additional information that can be derived from this approach to

assessment involves the intensity of the intervention required to produce change.

It is important to note that dynamic assessment contrasts with diagnostic teaching in its focus on cognitive functions and processes (e.g. strategy application) (Lidz, 1991:7).

This method of assessment is ideal for cognitive development as it also assesses meta-cognition:

> However, dynamic assessors are interested in the metacognitive processes of problem solving, as well as the extent to which the learner's metacognitive abilities can be enhanced (Lidz, 1991:7).

Data were collected in the pre-assessment phase by asking open-ended questions on the following:

- how they solve problems;
- how they make decisions;
- how they manage their staff (conflict handling and day-to-day activities);
- how they do strategic planning; and
- how they deal with creativity.

An open-ended questionnaire was designed for the post-assessment (Addendum B) on how they used the thinking tools they had acquired in the Thinking Skills Programme (Addendum H) in their day-to-day activities. Similar questions were asked as in the pre-assessment but they had to assess whether the intervention had changed the way in which they solved problems, made decisions, planned strategically, were creative and managed their staff. The post-assessment was conducted six months after the intervention had taken place. A

dynamic pre- and post-assessment approach was utilised. The rationale was a qualitative assessment supported, amongst others, by Costa (1984:57-62), Barrell (1991:65) Lidz (1991:6), Sternberg (1997:180-187), Kirkpatrick (1998).

The assessment of the questionnaires (pre- and post-questionnaires) was presented in graphs and tables displaying the frequency of occurrence of statements by participants which was done with the process of content analysis (Neuman, 2000). The main categories were identified by the questions asked in the questionnaires. The statements of the participants for each question were broken down into sub-categories. The statements or responses were clustered together to form a sub-category (Addendum D). The sub-categories of the main categories would indicate if there was a shift in the use of effective thinking skills by the participants in their role as middle managers. The sub-categories would indicate whether their cognitive processes had improved or not.

The categories were:

A. Problem solving:

- Identification of a problem.
- Have they considered all factors in the analysis of the problem?
- Have they considered the consequences for all parties involved?

B. Decision-making:

- Identification of a problem.
- Have they considered all factors in the analysis of the

problem?

- Have they considered the consequences for all parties involved?

C. Conflict handling:
- Identification of a problem in their day-to-day operation.
- Other people's views when they deal with people-related issues.
- Consequences of decisions when they have to deal with issues relating to staff and seniors.

D. Creativity:
- Have they identified opportunities?
- Have they implemented new ideas?

E. Strategic planning:
- Have they considered all factors when they plan strategically?
- Have they identified the consequences and sequence for the plan they identified to be implemented?
- Have they considered the alternatives and possibilities for the plan they identified to be implemented?

3.3.3.3 Interviews

In using interviews as a data collection method, the assumption is initially made that the participants' perspectives are meaningful, knowable, and able to be made explicit, and that their perspectives affect the success of the research (Mouton, 2001: 146). An interview is selected when interpersonal contact is important and when opportunities for follow-up of interesting comments are desired.

Interviews rely on verbal self-reporting and so the issues of validity and reliability come to the fore immediately. Validity was one of the advantages of interviews as there was direct contact at the point of the interview, which meant that data could be checked for accuracy and relevance as they were collected (Denscombe, 2000). The impact of the interviewer and the context meant that consistency and objectivity were hard to achieve. To a certain extent the data collected were unique owing to the specific context and the specific individuals involved. This had an adverse effect on reliability (Denscombe, 2000:137).

In semi-structured interviews (Addendum E), the researcher is interested in the understanding, knowledge and insights of interviewees. The interviewer is not limited by precise questions in a set order, although a number of topics have to be covered. In semi-structured interviews the interviewer can respond to unexpected information and introduce new, unanticipated questions to the interview (Denscombe, 2000). This is also termed a focus interview (Cohen & Manion, 1994:273), as it focuses on a respondent's responses to a known situation and the researcher (interviewer) can introduce verbal cues to obtain the responses required.

In this study the researcher conducted semi-structured interviews with the participants on the implementation of the intervention (Thinking Skills Programme - Addendum H). The questions were formulated on the basis of the open-ended questionnaires and day-to-day activities of the participants. During these interviews, feedback was given on the effectiveness of the intervention and on the application of the thinking tools that formed part of the Thinking Skills Programme.

Additional tools were introduced to stimulate the application of the thinking tools in their day-to-day activities (see Chapter Four). This is part of dynamic assessment of cognitive processes.

3.3.3.4 Observations

Observations were made in the workplace on a day-to-day basis as well as in management meetings.

Barell (1991:48) advocates a predominantly qualitative and observational method for gathering data in cognitive development when an intervention is conducted:

> You can observe a lot by watching. We need to find time to watch and analyze. We observe certain dispositions, or habits of mind, that are developed over a long period of time and are thus different from ephemeral feelings that can be changed more easily.

Brown (in Barell, 1991:65) refers to self- or meta-evaluation:

> The goals of thoughtfulness are that students internalize capacities to evaluate their learning, do so as they learn, and so in ways that exhibit their capacity to be performing thinkers, problem solvers, and inquirers.

Observational techniques are methods by which a researcher gathers first-hand data on participants, processes or behaviours being studied. Data can be collected on a wide range of behaviours, a variety of interactions can be captured and the topic under evaluation can be studied. To observe operations or activities, the researcher developed a holistic perspective, i.e., an understanding of the context within

which the research had been done (cf. Robson, 1993:190-191).

Participant observation (Robson, 1993; Denscombe, 2000) was used to infiltrate situations to understand the culture and processes of the group being investigated. The nature of participant observation allows the researcher to place greater emphasis on depth rather than breadth of data. Emphasis is placed on the holistic understanding, in which the individual things being studied are examined in terms of their relationships with other parts, and with the whole event or culture (Robson, 1993; Denscombe, 2000).

The observations made in this study were done in an unstructured way. Unstructured observations very often utilise qualitative approaches. The observations were recorded in the form of field notes in a written format. The field notes were recorded after management meetings on a two-weekly basis as well as during and after informal departmental meetings where managers would communicate with their staff.

Observational data were combined with information from conversations, interviews and documents to provide an in-depth picture of the thinking dispositions and thinking skills of the participants (Alvesson & Sköldberg, 2000). Observations were done with an open mind, to minimise the influence of preconceptions and to avoid imposing existing preconceived categories. In a qualitative study the investigator is the primary instrument for gathering and analysing data, and as such can respond to the situation by maximising opportunities for collecting and producing meaningful information (Merriam, 1988:20). The researcher must have enormous

tolerance for ambiguity. There are no set procedures or protocol that can be followed. This requires sensitivity (being highly intuitive) to context and all the variables in the physical setting, the people, the overt and covert agendas, the non-verbal behaviour and the information being gathered (Merriam, 1988:22). All observations and analyses are filtered through the researcher's worldview, values and perspectives. The researcher thus "brings a construction of reality to the research situation, which interacts with other people's constructions or interpretations of the phenomenon being studied (Merriam, 1988:23). In such an approach the aim (Foster, 1996: 6) is to develop theoretical ideas from an analysis of the data collected, so that the theory is "grounded" in the data. (Glaser & Strauss, 1967:237).

Observations were made by the researcher, who acted as a human resources consultant in the business unit. Ongoing observation was made possible by interaction in strategic planning and day-to-day management of the middle managers.

3.3.3.5 Field notes

The researcher took field notes to support the findings of the observations and semi-structured interviews. The delayed report method was used. The information was recorded at particular time intervals during the observation (Phillips, 1997).

Observations made in the workplace were recorded as field notes directly after the management meetings. Field notes were also used to capture observations after informal management meetings. Field notes were taken promptly after meetings or interventions in the

workplace to overcome the factor of failed memory (Denscombe, 2000).

The field notes were not taken while the researcher was part of an activity or action, but in privacy and where the participants were not aware that they were being observed (Denscombe, 2000).

3.3.4 Data analysis

One of the most important aspects of theory generation is the full documentation of the analytical process. This serves as a prompt for further analysis and is an important part of forcing the tacit, implicit or subliminal to the surface of awareness (Turner, 1981; Erwin, 1991). The analysis of qualitative data is a complex process that involves moving back and forth between concrete bits of data and abstract concepts, between inductive and deductive reasoning, between description and interpretation. These meanings or understandings constitute the findings of the study relating to category construction and theory building (Turner, 1981; Merriam, 1998).

There is little doubt that the process of qualitative data analysis is highly intuitive, but it is also systematic and informed by the purpose of the study (Merriam, 1998:156). This procedure begins with the development of an open-ended indexing system referred to as coding. Coding (or the labelling of phenomena) is the mechanism of analysing data and includes the breaking down, examining, conceptualising and categorising of data (Guba & Lincoln, 1989; Pidgeon & Henwood, 1992). Pidgeon and Henwood (1992) maintain that success in generating theory that is well grounded in data depends upon maintaining a balance between the full use of the researcher's own

subjective understandings, and concept matching.

The qualitative data collected through the open-ended questionnaires, observations and semi-structured interviews were analysed by means of content analysis (Neuman, 2000). Content analysis is a technique for gathering and analysing the content of text. Content refers to words, meanings, ideas, themes or messages that can be communicated. Text is anything written, visual or spoken that serves as a medium for communication (Neuman, 2000:34). Content analysis is nonreactive because the process of placing words, messages, or symbols in a text to communicate to a reader or receiver occurs without influence from the researcher who analyses its content (Neuman, 2000:293). With content analysis, a researcher can compare content across many texts (literature review and open ended questionnaires) and analyse it with quantitative techniques (e.g. charts and tables) (Neuman, 2000:293). A combination of latent coding and manifest coding was utilised for analysing the underlying, implicit meaning in the content of the text as well as counting the units that indicated thinking processes (Neuman, 2000:296). The use of both approaches strengthened the results. This method of content analysis was used to analyse the data in this study.

Data analysis thus employs structured observations on how to categorise and classify observations in terms of frequency, direction, intensity and space.

The content is thus analysed qualitatively and coded manually to produce subcategories and main categories.

3.4 VALIDITY AND RELIABILITY

As with any kind of research, the methods and conclusions need to be justifiable. Such justification cannot be an assertion or an act of faith, but must rely on demonstrating to the reader the nature of the decisions taken during the research and the grounds on which the decisions can be seen as "reasonable". Equally, the issues of objectivity, reliability and validity are as relevant to qualitative research as to any other approach (Kirk & Miller, 1986; Silverman, 1993; Miles & Huberman, 1984).

In a broad sense, validity means that the data and the methods are "right". In terms of research data, the notion of validity hinges around whether or not the data reflect the truth, reflect reality and cover the crucial matters. The idea of validity hinges around the extent to which research data and the methods for obtaining the data are deemed accurate, honest and on target (Denscombe, 2000).

Validity problems, along with the trustworthiness of the evaluator, affect the overall credibility of the evaluation. It varies from situation to situation and therefore the evaluator is concerned with the extent to which the data collected is credible and to which it actually measures what it is supposed to measure.

Validity asks the question: "Does the instrument measure what it purports to measure?" The following procedure is recommended to establish the validity of an instrument (Mueller, 1986):

- Clearly define what it is that needs to be measured.
- Prepare a draft of the instrument in consultation with other colleagues. Search for existing instruments related to the topic

of interest to use as a guide in developing the instrument.

- Identify five to seven persons to serve as a panel of experts for reviewing the instruments in terms of content, format, and audience appropriateness. In this study the panel consisted of senior managers and a psychologist in the organisation who expressed the need to train middle managers on effective thinking skills. The panel reviewed the instruments and gave feedback.

- Revise the instrument by incorporating the suggestions offered by the panel of experts. The researcher incorporated the suggestions, for example, the use of real work problems such as budget planning and implementation of new systems in the business unit.

- Field test the instrument to find out its suitability and clarity. The selected group to test it was the human resources team operating in the business unit. Verbal feedback was received. The instrument was reviewed for clarity, content, wording and length.

A special concern to utilisation-focused evaluators is face-validity. This concerns to which an instrument appears to measure what it is intended to measure. An instrument has face validity if stakeholders understand what is being measured. Data analysis, interpretation and use are facilitated by attention to face validity – making sure users understand and believe in the data (Rutman, 1984:32; Patton, 1986: 122; Patton, 1997: 252-255). Face validity was confirmed by implementing the programme in the business unit and the feedback from observations and semi-structured interviews were used in the programme.

To ensure validity, the findings need to be triangulated and the outcome of the findings must be communicated to the stakeholders.

Internal validity refers to cause and effect - to the trustworthiness of an inference - the degree to which findings correctly map the phenomenon in question, in the sense that the researcher is reasonably confident about interpretation (Rutman, 1984:33; Patton, 1986:234-235; Merriam, 1988:166; Silverman, 1993:91; Seale, 1999:38-42).

To enhance internal validity the following were used:

- triangulation, through which multiple sources of data (literature review, open-ended questionnaires questionnaires, observations and semi-structured interviews), multiple methods of data collection and a holistic understanding of the situation were employed to construct plausible explanations of any particular phenomenon;
- member checks through which data and tentative interpretations were continuously checked with participants during delivery; and
- the researcher's position through which the researcher's assumptions, world-view in the context of the organisation, as well as theoretical orientation were clarified with senior managers and participants (stakeholders) at the outset of the delivery of the programme.

External validity refers to the degree to which findings can be transferred to other settings similar to the one in which the study occurred - the confidence that the researcher had in generalising or

rather extrapolating findings beyond the situation that was studied. Extrapolation refers to the creative process of thinking about what specific findings mean or how it applies to other situations, rather than the statistical process of generalising from a sample to a larger population.

Authenticity rather than reliability is often the issue in qualitative research, as the aim is to gather an authentic understanding of people's experiences. Validity focuses on the meaning and meaningfulness of data; reliability focuses on consistency of results. It is the extent to which the findings can be replicated or produced by another inquirer (Patton, 1986: 228-230; Merriam 1988: 170; Patton, 1997: 255-257). A good level of reliability means that the research instrument produces the same data time after time on each occasion that it is used, and that any variation in the results obtained through using the instrument is due entirely to variations in the thing being measured. A research instrument such as a questionnaire is said to be reliable if it is consistent, and this is generally deemed to be a good thing as far as research is concerned (Denscombe, 2000). But with qualitative research the researcher's self is an integral part of the research instrument. The issue of reliability then is transformed into the question: If someone else did the research would he or she have got the same results and arrived at the same conclusions? (Denscombe, 2000:213). To ensure reliability in qualitative research an explicit account of the following needed to be provided:

- the aims of the research and its basic premises (purpose, theory);
- how the research was undertaken;
- the reasoning behind key decisions made.

To enhance reliability in this study the researcher explained assumptions and the theory behind the study in Chapter Two. Triangulation is used in terms of using multiple methods of gathering data as well as the sources of data, and, in order for an audit to take place, the researcher described in detail how data were collected, how categories were derived, and how decisions were made throughout the study (Merriam, 1998:206). Triangulation is less structured and the emphasis is on rapport, trust and participation as measures of avoiding error and establishing validity (Mertens, 1998:13; Mouton, 2001:25; Gough, 2000:29).

3.5 ETHICAL CONSIDERATIONS

Participants were ensured of confidentiality throughout the research process and reporting of the results. This corresponds with the assessing of employees' behaviour (Robson, 1993: 473; Jacobson, 1996: 30). They were protected from being identified, since names were omitted in the research instruments.

The participants were informed of the objectives of the programme to gain their consent for taking part in the programme (Robson, 1993: 471). The participants also gave their consent to be observed during their normal tasks (Robson, 1993: 474).

Permission for the use of the CoRT programme was obtained by the licence bought by the company at which the Thinking Skills Programme was used.

3.6 CONCLUSION

Qualitative programme evaluation is an approach to evaluating (i.e.

determining the merit or worth of, or both) social and educational programmes (and policies, projects, and technologies) that make use of typically "qualitative" methods for generating data (e.g. unstructured interviewing, observation, document analysis) and nonstatistical means of analysing and interpreting that data (Schwandt, 1997:130). This process supports the dynamic assessment of cognitive processes where information has been gathered to assess development in the process of learning. The training programme needed to be evaluated in a dynamic process to determine whether changes needed to be made, based on the dynamic assessment of the participants during the training process. The qualitative methods of gathering information, observations and semi-structured interviews were helpful in the dynamic assessment process.

The findings of the data collected and analysed will be presented and discussed in Chapter Four. Chapter Four will focus on the intervention - the Thinking skills Programme.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF FINDINGS

4.1 INTRODUCTION

4.2 RESEARCH FINDINGS

4.2.1 Pre-assessment

4.2.2 Semi-structured interviews

4.2.3 Observations

4.2.4 Field notes

4.2.5 Post-assessment

4.3 DISCUSSION

4.3.1 Introduction

4.3.2 Pre- and post assessment results

4.4 SUMMARY OF FINDINGS

4.4.1 Category one: Problem solving

4.4.2 Category two: Decision-making

4.4.3 Category three: Creativity

4.4.4 Category four: Solving conflict

4.4.5 Category five: Strategic planning

4.4.6 Category six: Day-to-day activities

4.5 CONCLUSION

4.1 INTRODUCTION

The purpose of this chapter is to present, discuss and interpret the findings of the research in the light of the theoretical framework of this study as discussed in Chapter Two.

Analysis of the qualitative findings of the implementation of the thinking skills programme will be discussed in this chapter. The pre-assessment findings and post-assessment findings will be presented in graphs and tables and discussed. Findings from the semi-structured interviews and observations made in the workplace will be discussed and correlated with the findings in the pre- and post-assessments. Triangulation as a strategy to prove internal validity was used to bring findings in the literature review, semi-structured interviews and observations, as well as findings from pre- and post-assessment, into correlation.

Qualitative data include information which the researcher collected by allowing questions to be answered in the participants' own words (open-ended questions).

The information was collected through open-ended questions in questionnaires, semi-structured interviews and observations.

In order to establish with some degree of plausibility that the intervention (Thinking Skills Programme) had made a positive change, or had had positive effects, the researcher had to show that there had been a positive change over time (six months) (Mouton, 1998:88). This condition was met through the use of pre- and post-assessments (measures), i.e. through collecting baseline data. This was followed with similar measures later on in the study.

4.2 RESEARCH FINDINGS
The qualitative flow of the research findings process is presented in the diagram below.

Figure 4.1: The process flow of the research findings

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┌──────────────┐      ┌──────────────┐      ┌──────────────┐
│ Pre-         │ ──▶  │ Semi-        │ ──▶  │ Post –       │
│ assessment   │      │ structured   │      │ assessment   │
│              │      │ interviews   │      │              │
└──────────────┘      └──────────────┘      └──────────────┘
                            ▲  │                   ▲  │
                            │  ▼                   │  ▼
              ┌──────────────────────────────────────────┐
              │ Observations and field notes             │
              │ (Ongoing)                                │
              └──────────────────────────────────────────┘
```
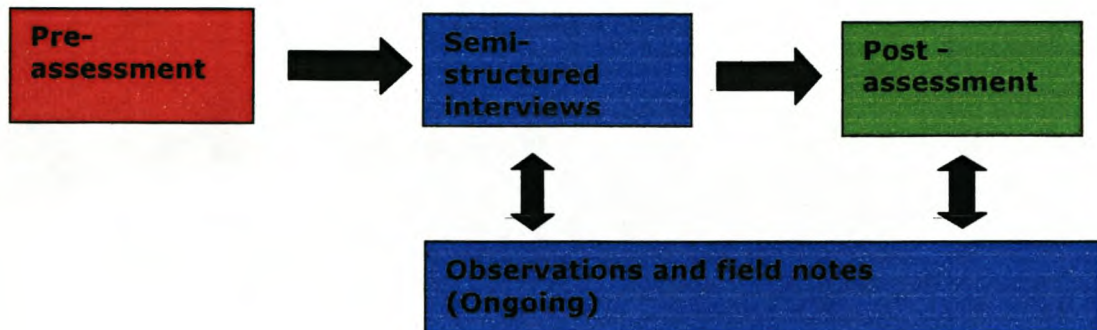
A first important question in a programme that evaluates outcomes is whether the participants had changed in the direction that the programme was planned.

As discussed in Chapter One and Chapter Three, the standard evaluation design that addresses questions such as this is the pre-assessment - post-assessment design. This design was used to establish whether the participants had improved while being served by the Thinking Skills Programme (Babbie & Mouton, 1998:338).

The participants in the programme were asked certain questions to ascertain their level of competence of thinking skills and thinking dispositions in solving problems, making decisions, solving conflict, being creative, thinking and planning strategically and managing their staff on a day-to-day basis. This was done before the intervention

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(pre-assessment – Addendum A), with a questionnaire by the researcher as an independent observer. The same and similar questions were repeated after completion of the programme (post-assessment – Addendum B).

Responses from the pre-assessment and post-assessment as well as observations and semi-structured interviews were integrated and analysed through content analysis (see p.108). A combination of latent coding and manifest coding was utilised for analysing the underlying, implicit meaning in the content of the text as well as counting the units that indicated thinking processes (Neuman, 2000:296). The use of both approaches strengthened the results. The following categories, which will be discussed in terms of the pre- assessment, post-assessment, semi-structured interviews and observations, were constructed in terms of the frequency of their occurrence (Neuman, 2000:294). The categories were identified in the questionnaire and based on the findings in the literature review on teaching thinking skills and cognitive development in adults (see categories and sub-categories summarised in Discussion).

4.2.1 Pre-assessment

The information in the pre-assessment was gathered from participants (n=30) that participated in the intervention and completed the open-ended questionnaire. Both the main categories and the sub-categories were identified from the statements in the open-ended questions in the open-ended questionnaire (Addendum D). This was done with content analysis. The researcher decided on the units of analysis (Neuman, 2000:296). The units reflected in the sub-categories that emerged from the statements of the participants. With content

analysis, the researcher can compare content across many texts and analyse it with quantitative techniques (e.g. graphs and tables). In addition she can reveal aspects of the text's content that are difficult to see (Neuman, 2000:293).

The categories were summarised in the table below.

Table 4.1:   Categories in pre-assessment

Category	Sequence in appearance in Chapter Four
Category one: Problem solving	Page 121
Category two: Decision-making	Page 128
Category three: Conflict handling	Page 133
Category four: Apply creative thinking in the workplace	Page 137
Category five: Strategic thinking	Page 141

The statements of participants are presented verbatim.

Category one: Problem solving

Sub-categories:

- Identify the problem.
- Analyse the problem.
- Discuss the problem.
- Look at options and solutions.
- There is no analysis of the problem.
- Come up with one solution to solve problem.
- Supply resources to solve problem.
- Implementation plan to solve problem.

The statements of participants that emerged in the sub-categories

were the following (statements of participants are presented verbatim):

Identify the problem:

i. Firstly I make sure that I know exactly what the problem is.

ii. Understand the problem.

iii. Address and identify it.

iv. Source the problem and motive for problem.

v. Define the problem.

Analyse the problem:

i. Try to understand the problem.

ii. Analyse the problem.

iii. Look at parties involved.

iv. Break the problem up into basic pieces.

v. Think backwards.

vi. Look at cause.

vii. Look at root causes.

viii. How did it start?

ix. I try to determine what caused the problem.

x. Consider what I have in hand - reason for this.

xi. Where did it go wrong?

xii. Have an open forum and discuss problem.

xiii. Look at what the problem is doing to me.

xiv. How is it going to affect me?

xv. Have I been faced with this before?

xvi. Ask for assistance if I am stuck.

xvii. First get all the facts, i.e., where does it come from and what has it led to, consequences etc.

xviii. *Picture the problem in your mind.*

xix. *Try and think whether or not I would be able to solve by myself or need assistance.*

Discuss the problem:

i. *Consult some friends and ascertain whether they have any views/advice on the solution.*

ii. *Chat to other people involved; get their views.*

iii. *Consult some friends and tell them what is bothering me.*

iv. *Ask for assistance if I am stuck.*

v. *Look for solutions - either by myself or by involving people who form part of the problem or who might have previous experience.*

vi. *Determine a solution that will be favourable to all parties.*

vii. *Deal with problem in a way that will make all parties happy.*

Look at options or solutions:

i. *Look at options/solutions.*

ii. *Consult some friends and ascertain whether they have any views/advice on the solution.*

iii. *Chat to other people involved; get their views.*

iv. *Deal with problem in a way that will make all parties happy.*

v. *Deal with people that cause problem.*

vi. *Think of whether it covers all problems.*

vii. *Whether the consequences will be what I want.*

viii. *Try to work out what is needed to solve the problem.*

ix. *Work out what to do.*

x. *Find ways to solve it.*

xi. *Use methods I used before and solve my problem.*

xii.   *I try to ignore the name of the person who caused it because the tendency is to shift the responsibility to that person and in the act cannot focus on solving it.*

There is no analysis of the problem:

i.   *I know what to do right away.*

ii.   *Understand where I want to be at the end.*

iii.   *I figure myself how I will do it.*

iv.   *Start to tackle the issue until it is completed correctly.*

Four participants indicated only the solution to the problem with no evidence of analysing the problem or identifying it.

Come up with one solution:

i.   *Choose one right option.*

ii.   *Determine a solution which will be favourable to all parties.*

iii.   *If problem is wrong-discard it.*

iv.   *If problem is not a problem, continue with it.*

v.   *See if one option is suitable, if not, then think of alternatives.*

vi.   *Whether the consequences will be what I want.*

vii.   *Add up all the advice and come up with a final decision on how to go about and solve it.*

viii.   *Plan how I will obtain my objective.*

Supply resources to solve problem:

i.   *Who are/what resources do I have - are these resources readily available. If not, any other options.*

ii.   *Having all the resources and taking out the person, what do I expect the end results to be.*

iii.   *Try and think whether or not I would be able to solve by myself*

or need assistance.

Implementation plan to solve problem:

  i.   *Make an informed decision with timelines and follow up on timelines.*

  ii. *Plan how I will obtain my objective.*

  iii. *Formalise action plan.*

Problem solving can be viewed as involving four stages: (1) comprehending the problem, (2) developing or recalling a solution, (3) making use of that solution, and (4) evaluating the consequences (Woolfolk, 1990:267). The responses of the participants were captured through content analysis within this framework.

Certain aspects of problem solving that were absent were identified from the statements of the participants. Three participants indicated no analysis of the problem. They immediately focused on the answer to the problem. None of the participants indicated any creativity in the solving of problems. A statement to explain the non-creativity is:

I use methods that I have used before and solve my problem.

Nineteen participants indicated that they were quite familiar with **analysing** a problem as managers. According to Arlin (1975:603), the adults (participants) operated in the problem-solving stage; the focus in this stage is on "the process of seeking a solution of a specific presented task".

Twelve participants indicated that they would have solutions or options

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to solve the problem. They did not, however, indicate that they would take time to think (thinking disposition) and come up with more than two or three solutions as eight respondents indicated that they would come up with **a solution**. Two respondents came up with no solutions at all.

A summary of the findings is presented in Figure 4.2

Figure 4.2: Pre-assessment: problem solving

Pre- assessment: Problem solving
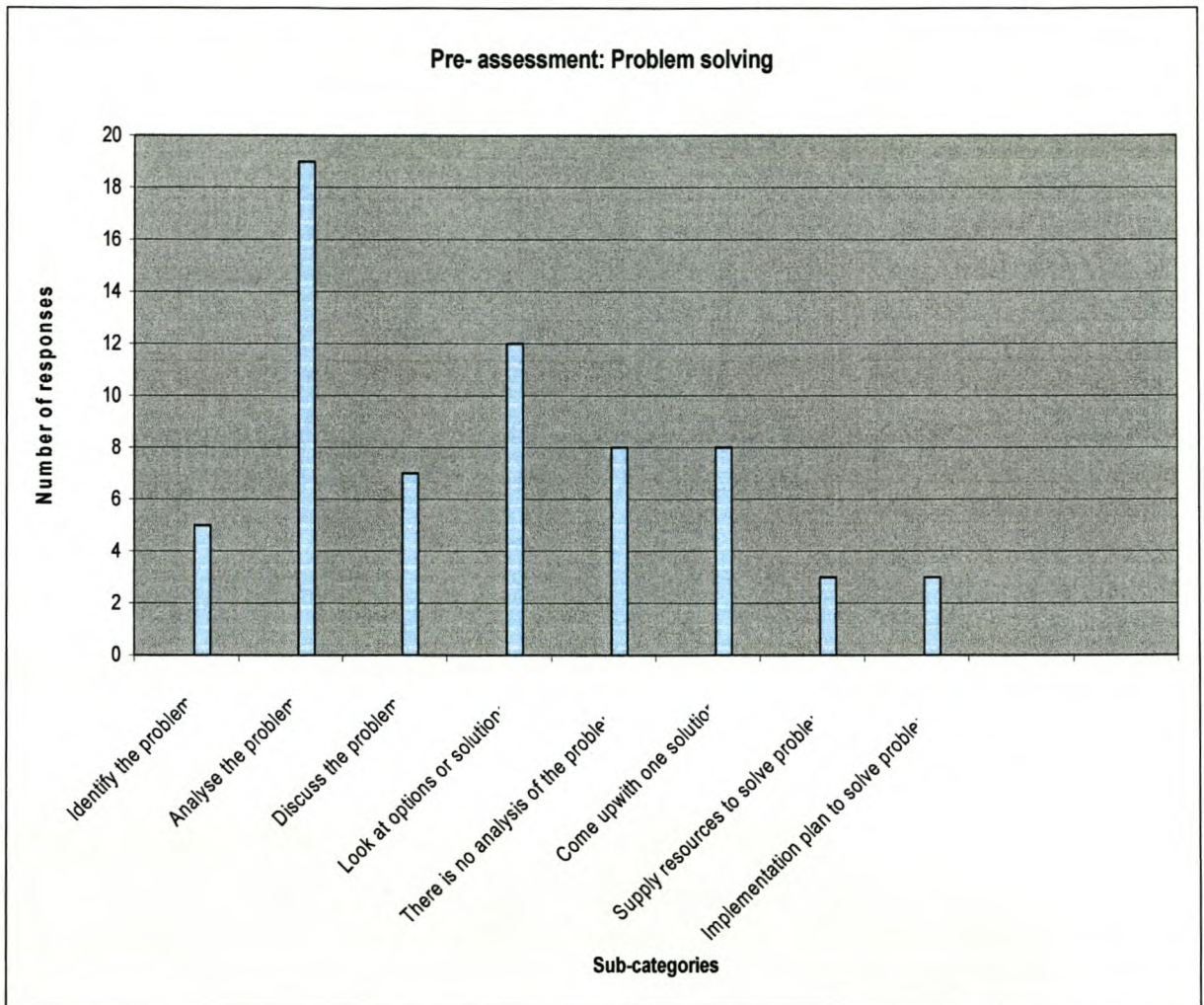
Category two: Decision-making

Sub-categories:

- Analyse the problem.
- Look at consequences of decision.
- Implement one solution (no alternatives generated).
- Weigh up alternatives.
- Consider other factors.
- Generate more than one solution/option.
- Take time to think.

The statements of participants that indicated the sub-categories were the following:

Analyse the problem:

i.   *Weigh the pros and cons of the problem. (6)*

ii.   *Try to get as much info as possible.*

iii. *Take examples from a similar situation. (3)*

iv.   *Speak to people who have been in the business longer than you and find out how they have handled the situation. (4)*

v.   *Speak to your colleagues. (3)*

vi.   *Probe people for more information.*

vii. *Read books in the library and use the Internet. (3)*

viii. *Get enough information.*

ix.   *Analyse the problem to understand it. (3)*

x.   *Understand the issues around the decision. (1)*

xi.   *Begin with what the end result must be. (2)*

Look at consequences of decision:

i.   *Think how my decision is going to impact on my life and decide from there. (3)*

ii.   How will it benefit me in future.

iii. Whatever I decide, will I be able to look back and agree with what I decided (must feel in heart that it is the right decision. (2)

iv.   Decide which will suit me and other parties best. (1)

v.   Look at short and long term consequences. (1)

Implement one solution:

i.   Usually goes with the gut or what feels right. (3)

ii.   Trust your instinct.

iii. Come up with a solution. (2)

iv.   Use the resources that were used in similar situation. (1)

v.   Will decision take me close to where I want to be. (1)

Weigh up alternatives:

i.   Usually weigh up alternatives.

ii.   Decide which will suit myself and other parties best.

iii. Choose the alternative that appears to be the best.

Consider other factors:

i.   Look at the cost and see if I will be able to bear it.

ii.   Take into account my morals as well.

iii. I like to have both sides of the story to make a decision.

Generate more than one solution/option:

i.   Then (after what you know it should be - a solution) probe for possible solutions.

Take time to think:

i. I would first relax, calm down, pause, and then think.

ii. Take a lot of time to think about it, especially if it is a problem.

iii. Then I put it out of my mind for a while. When I am feeling OK with it I start rethinking through it.

The participants' statements from the open-ended questionnaire (Addendum A) indicated an absence of generating alternatives when they had to make decisions. Six participants indicated no evidence of generating alternatives and six participants indicated no intention of looking at other people's views when they had to make decisions. Goals must often be broken into subgoals, each of which must be resolved to accomplish the goal. The subgoal that addresses the most important aspects of accomplishing the goal will be solved first. The participant (adult) chooses from different methods to solve the subgoals, often trying them on a trial and error basis until a satisfactory solution is found (Anderson, 1985). The participants did focus on analysing the problem but the specific breakdown in subgoals was not evident. The absence of the thinking processes as described above indicated that the participants did not think effectively in making decisions as they only focused on their own input in the decision-making process and only focused on one solution as the best solution to make a decision. Thinking more creatively in decision-making was absent in six participants' statements. It was once again evident in their statements that they focused on **analysing** a problem when making decisions, as 28 indicated that in their statements. The participants operate in a society where analysing is an important thinking competency and the origin of thought is in the individual

and in society, and represents a necessary synthesis in the development of thought toward maturity (Riegel, 1973:350). This indicated the need to teach more effective thinking skills. This ties in with De Bono's (1996:12) view: "Most of the major problems in the world will not be solved by yet more analysis. There is a need for design."

The summary of the findings of categories and sub-categories is presented in Figure 4.3.

Figure 4.3: Pre- assessment: decision-making
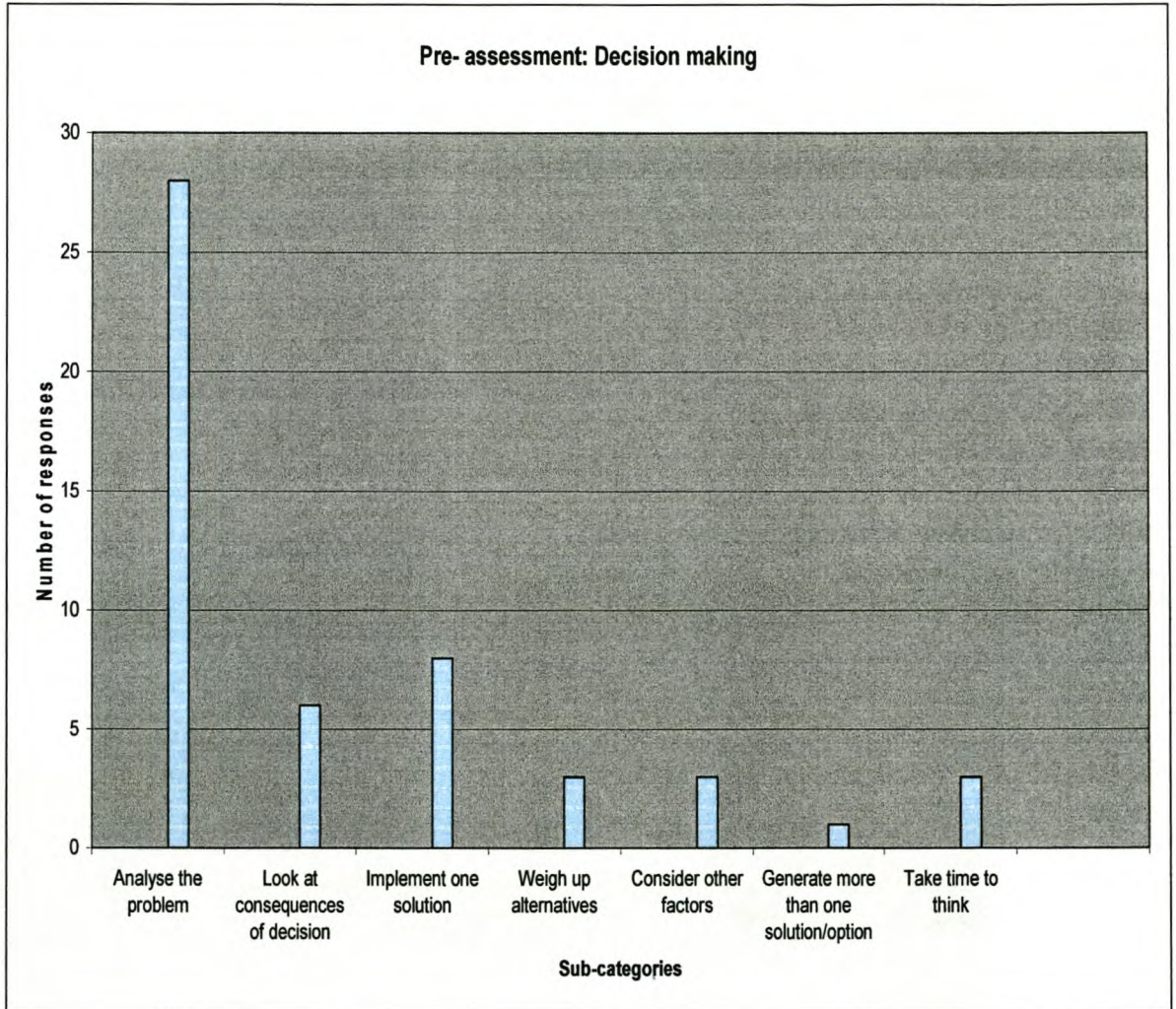
Category three: Conflict handling:

Sub-categories:

- Identify the problem that caused the conflict.
- Analyse the problem.
- Solution: goes with what feels right for the person.
- Generating options/solutions to the conflict.

The statements of participants that indicated the sub-categories were the following:

Identify the problem that caused conflict:

i. Identify the problem.

ii. Know exactly what the problem is.

iii. Have to understand the issue.

iv. Acknowledge the problem (what it is).

Analyse the problem:

i. *Will analyse the problem and give feedback to person after the decision is made.*

ii. *Ask more questions to understand what the problem is.*

iii. *Ask more questions then decide on solution.*

iv. *Take note of the facts either mentally or on paper.*

v. *Take examples from a similar situation*

vi. *Think of all pros and cons.*

vii. *Try to work out what is needed to solve the problem.*

viii. *Get all the facts - analyse the facts.*

ix. *Discuss situation with the cause or get to the root of the problem.*

x. *Think about what caused the problem.*

xi.   *Consider what I have on hand. Reason for this.*

Solution: goes with what feels right for person:
  i.   *Usually go with the gut or what feels right.*
  ii.   *Focus on myself-how will conflict impact on my life and decide from there.*
  iii. *When I make decision on how to handle conflict my feeling is important.*
  iv.   *Usually have a good idea what to do right away.*
  v.   *Look at the worst side of the conflict and see if I will be able to bear it, if it is going to take close to where I want to be.*
  vi.   *Will look at consequences for me now and in future.*

Generating options/solutions to the conflict:
  i.   *Look at the options I have towards solving the conflict.*
  ii.   *Identify a solution and look at the pros and cons and decide which will suit myself and other parties best. Take into account my morals as well.*
  iii. *Use someone as a soundboard to discuss conflict*
  iv.   *Open communication - get others involved.*
  v.   *After facts have been analysed make an informed decision (2).*
  vi.   *Try to see the bigger picture.*

The eleven participants' comments on the open-ended question on how to solve conflict showed that they analysed the problem they were facing, for example:

Ask more questions to understand what the problem is.

Six participants generated solutions or options to solve the conflict but the focus was very much on them and on how the conflict would impact on their lives and the self:

Focus on myself - how will conflict impact on my life and decide from there.

Once again it indicated that the participants needed to improve their thinking skills in order to move away from the one focus - themselves - and look more broadly (thinking disposition) to identify more options or alternatives and take the other person's view into consideration. This would improve their management skill to consider more factors and make a collaborative decision on solving the conflict.

The statements indicated that they did not spend enough time on thinking (thinking disposition) the problem through, as they stated:

Usually have a good idea what to do right away
and
Usually go with the gut or what feels right.

A summary of the findings is presented in Figure 4.4.

Figure 4.4: Conflict handling: pre-assessment
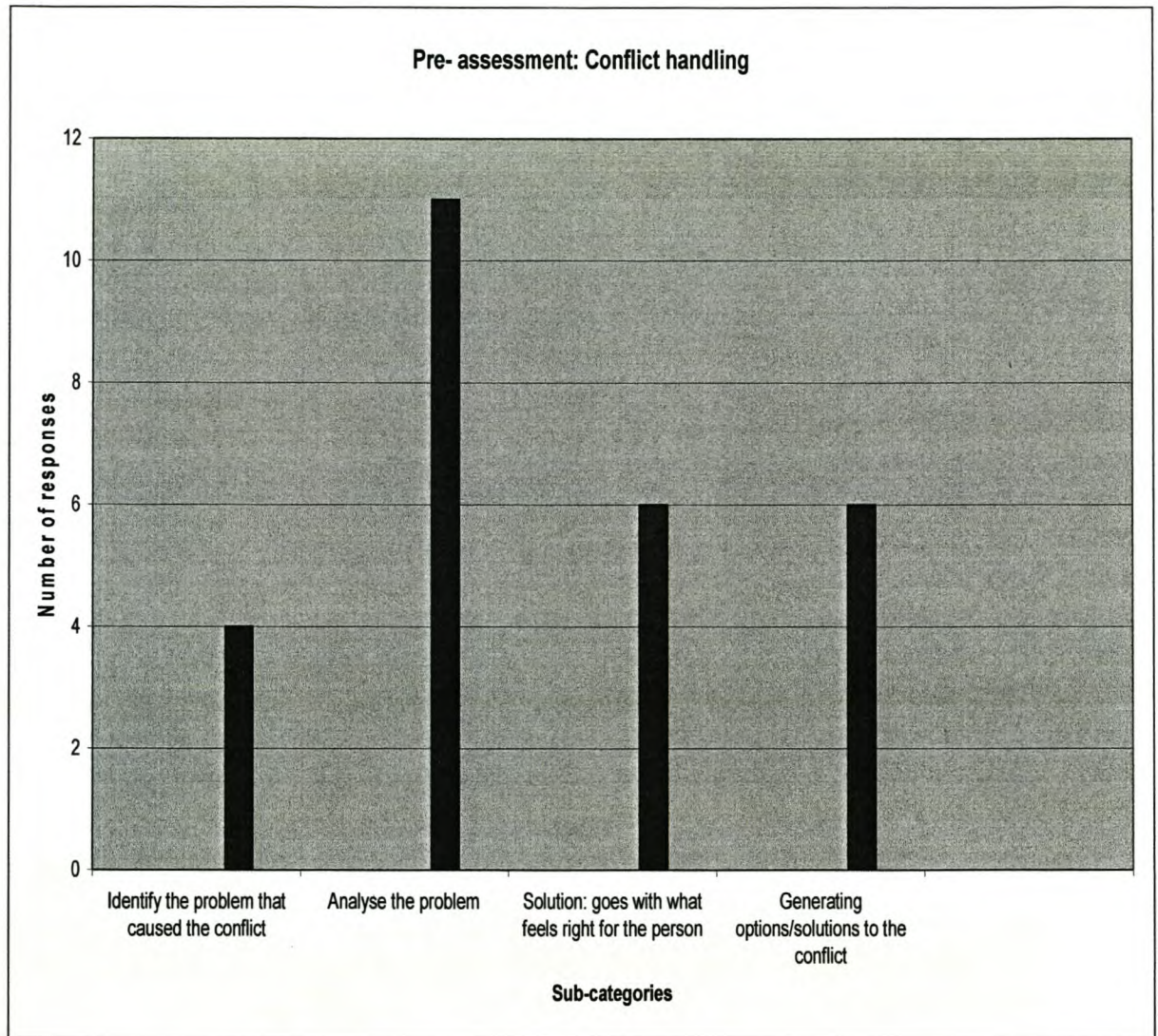
Category four: Apply creative thinking in the workplace:

Sub-categories:

- Not creative in the workplace.
- Weigh up alternatives.
- Use previous experience.

The statements of participants that indicated the sub-categories were the following:

Not creative in the work place:

Twenty participants responded that they did not have the opportunity or need to be creative in their work place.

Weigh up alternatives:

   i.   *Weigh up the alternatives to be creative when dealing with work problems or decisions.*

   ii. *Ask for different views and advice.*

Use previous experience:

   i.   *Establish whether any work has been done previously. Use this, rather than re-inventing the wheel.*

   ii. *Use prior experience of other people/experts in the field.*

The 20 participants indicated that creative thinking was not needed in their work environment and they did not need to use it. If they had to design or create a new process or were faced with a new problem, they would use prior experience. Two participants indicated that they would use prior experience and methods that had been used in the past and they would build on that. In itself to use prior experience is a

part of creativity. They had been using their knowledge in the field they operated in. When a person makes some innovation, no matter how radical, in order for that product to make sense to the creator, he or she must be able to link it to what has been before. Therefore, in order to produce it in the first place, the thinker must have started with something from the past (Bailin, 1988; Sternberg, 1999:246). Any changes introduced, which may serve to turn the product into something radically new, were probably also based on knowledge (Sternberg, 1999:247). The need is to build on the prior experience and design a new way of working from it. An example of this kind of thinking was:

Establish whether any work has been done previously. Use this rather re-inventing the wheel.
Use prior experience of other people/experts in the field.

This in itself will not be a problem and can be the start of the creative process, but the participants do not continue on the learning from prior experience - they do not learn from it. They apply it as it is. They were not operating in the fifth stage of cognitive development, characterised by "creative thought vis-á-vis discovered problems" and the ability to generate and respond to important new questions and answers (Arlin, 1975:603).

There is, however, evidence of creative thinking in their statements in how they solve problems. This is a possibility of deep immersion that provides extensive opportunities for practising any skill required to create within the domain, which makes them automatic (Sternberg, 1999:247). Automaticity of skills may be necessary for the production

of novelty. One does not have to think about how to express one's ideas, one can just do it as the ideas become available, for example to create the scenarios of the end picture (Sternberg, 1999:247). An example of their thinking was:

Begin with what the end result must be.
Having all the resources and taking out the person, what do I expect the end results to be?

The teaching of effective thinking skills will focus their attention on their own thinking - metacognitive thinking - and they will become aware of the creative thinking they already apply. They will most probably apply it more in the workplace.

A summary of the categories and sub-categories is presented in Figure 4.5.

Figure 4.5: Pre-assessment: creativity in the workplace

Pre- assessment: Creativity in the workplace
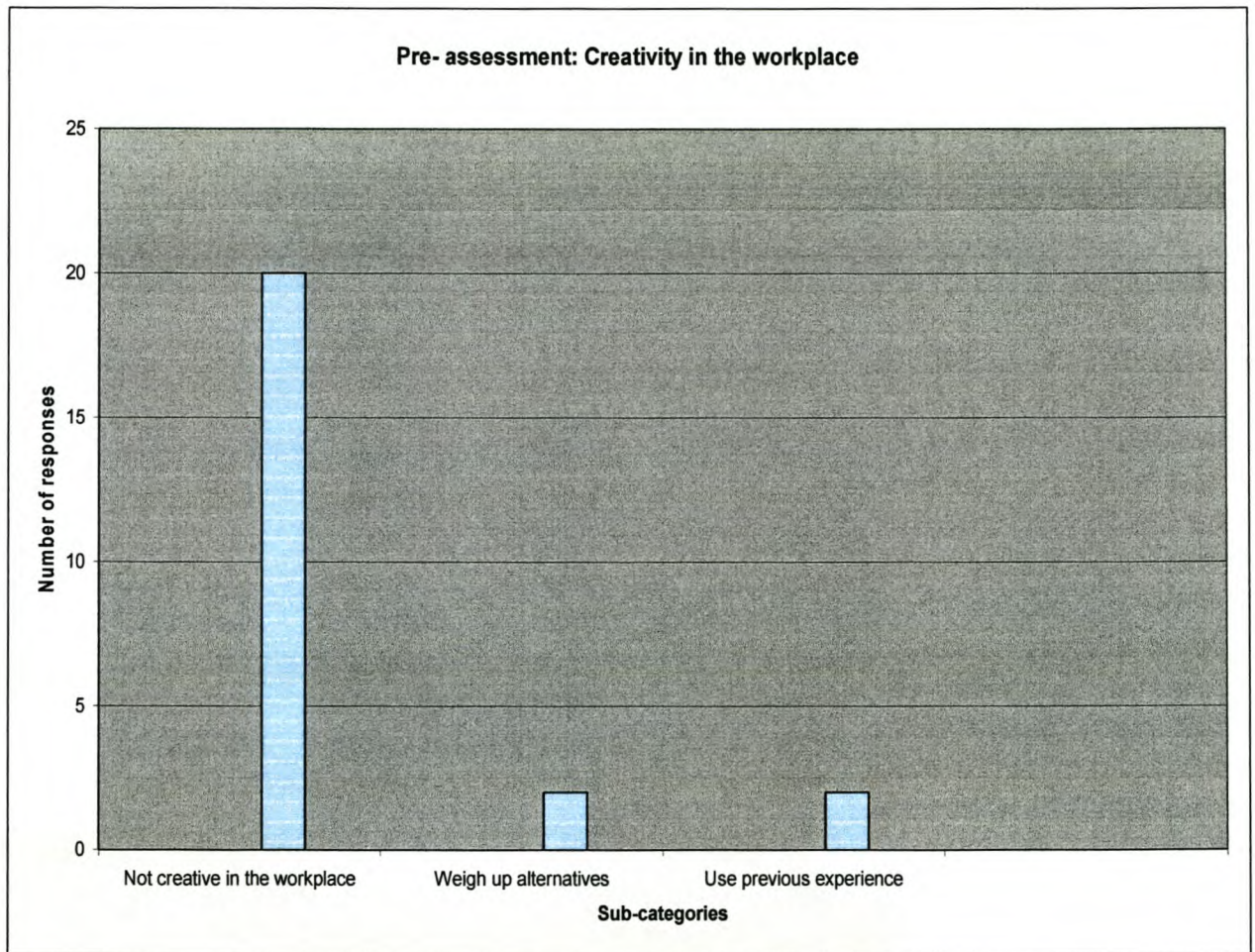
Category five: Strategic thinking

Sub-categories:

- Generate options.
- Analyse the plan.
- Involve others in the planning.
- Identify end result.
- Generate alternatives.
- Take into account other factors.

The statements of participants that indicated the sub-categories were the following:

Generate options:

i. Look at the options.

ii. Think and come up with ideas.

iii. Look at possible solutions.

Analyse the plan:

i. Look at the pros and cons of the plan.

Involve others in the planning:

i. Discuss in an open forum.

ii. Get input from all the stakeholders.

iii. Discuss with other people.

iv. Ask input from others.

v. Use methods we have used in the past to do strategic planning.

Identify end result:

    i.   *Need to have a full understanding of where we want to be.*

    ii.   *Understand where we want to be at the end.*

    iii.   *How it will influence our future.*

    iv.   *Will first assume what we want to achieve.*

    v.   *Gather information before the planning session.*

    vi.   *Look at previous scenarios.*

Generate alternatives:

    i.   *Usually weigh up the alternatives.*

    ii.   *Investigate the alternatives.*

Take into account other factors:

    i.   *Take into account factors that will influence outcome.*

    ii.   *Get the bigger picture.*

Six participants indicated that they focused on the outcome in strategic planning. Seven participants indicated that they did involve other people in the process of strategic planning. Generating alternatives and weighing up options were evident as well. Four participants indicated that they did generate alternatives. They did not, however, focus as strongly on this as on identifying where they wanted to be. Eight participants indicated that they focused on this aspect of thinking in their statements.

A summary of the findings is presented in Figure 4.6.

Figure 4.6: Pre- assessment: strategic planning

Pre- assessement: Strategic planning

Number of responses

Generate options   Analyse the plan   Involve others in   Identify end result   Generate   Take into account
                                        the planning   alternatives   other factors

Sub-categories
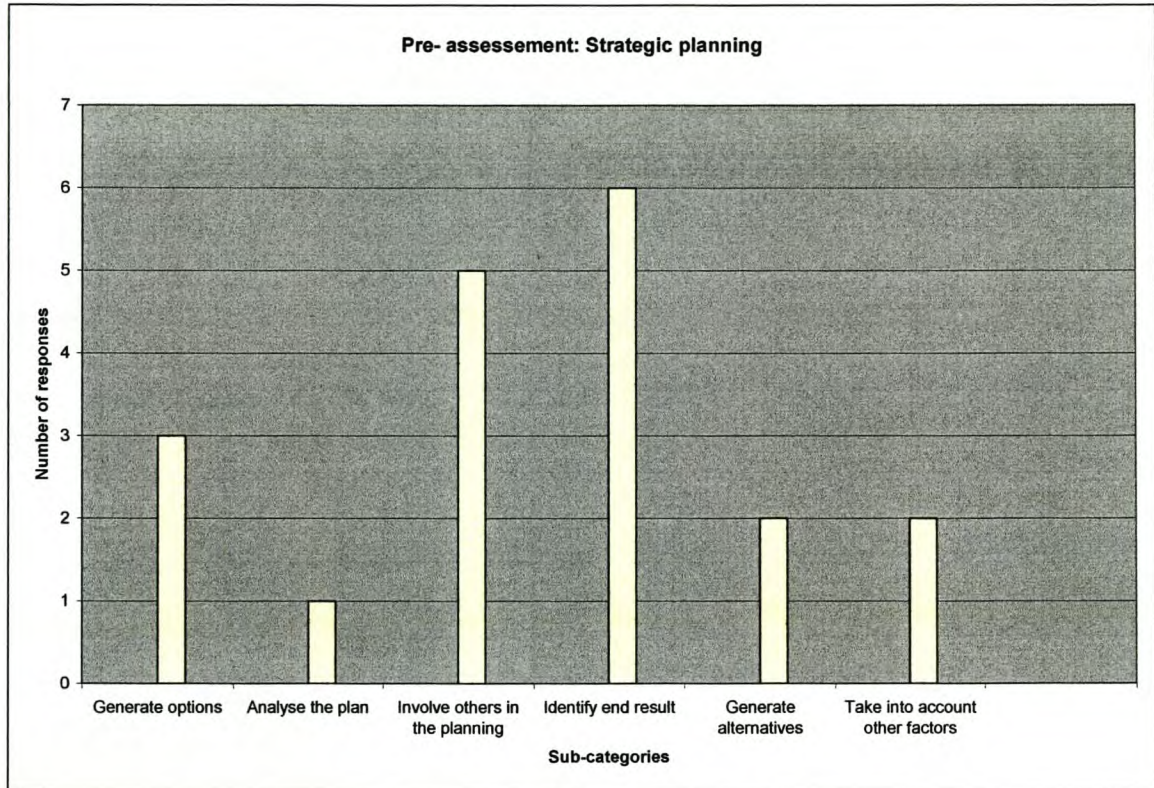
4.2.2 Semi-structured interviews

Semi-structured interviews (Addendum F) were conducted with the participants randomly during the training sessions. The purpose of the semi-structured interviews was to collect information from the participants on their thinking in the workplace after they had attended the first and second training sessions on the Thinking Skills Programme. This qualitative assessment measurement forms part of dynamic assessment where information gathering on the process of

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teaching thinking is important to assess whether transfer of learning has taken place. It is necessary in order to determine what needs to be changed or added to the programme to ensure greater transfer of learning and effective implementation of the thinking skills (Babbie & Mouton, 1998:338).

The researcher asked the participants whether they had experienced any difference in the application of their thinking skills in solving problems, making decisions and managing their subordinates in the day-to-day activities. One participant replied as follows:

The Thinking Skills Programme helped us to realise that we need to improve our thinking, but it is not easy to apply the tools in our day-to- day activities. We fall back into the old ways of doing/thinking and need something to remind us of using the tools.

The researcher asked the participants what would help them to remember to use the tools and they replied that they needed visual stimulation. They needed a visual stimulation that they could take with them to meetings and when they communicated with their staff in the work environment. The researcher undertook to design a visual tool that would help to remind them to use the tool.

The participants indicated that it was not easy to change their old thinking habits. Resistance was noted with some of the participants as they replied:

I don't have time to sit down and think which tool I must use when I am faced with a problem. I have solved problems quite effectively in

the past and don't know if I will use the tools. There is no time during the day to spend thinking how I solve a problem or to think of all the factors when I have to make a decision.

The resistance to change was noted and the researcher had to plan to address the problem in the following training session. The group needed to help solve this problem as they were experiencing the same problem. It was important to take cognisance of mature adult cognition that involves more than just the ability to think in abstract logical terms, and cognitive development in adults cannot be separated from its social and cultural context (Merriam & Caffarella, 1991:196). The participants operated in a volatile changing environment where reduction of jobs was imminent. When dealing with adults it is important to understand how they learn and why they show resistance to learning a new skill. Adult learners do not always respond to a potential learning experience: perhaps because they are too busy to think about it or perhaps because they are fearful of its outcome (Brookfield, 1987:89; Jarvis, 1995:90; Bloodgood & Morrow, 2000:208). De Bono (2000:50) argues that this is the very problem with a person's old thinking and judgement, namely that if something is good, then that thinking is good – it is placed in the "good-to-have" box and more of it is wanted.

To transfer knowledge to the educated adult learner, the form of learning must be the utilisation of knowledge. An idea or information is useful or productive to the extent that it is put to use in the solution of problems (Arlin, 1975; Hergenhahn, 1988).

Although resistance was noted in some of the participants, the reverse

was experienced with other participants. They utilised the tools in their personal lives to solve difficult problems and were very excited at the outcome of the use of the tools.

> *After the first session I was excited to learn that I can improve my thinking and as I am faced with a personal problem at home I decided to test the tools to help me solve the problem. It worked and I managed to stay in control and came up with more than one solution to a very difficult problem. If it works in my personal life I will surely use it to manage conflict at work and when I don't know how to solve difficult work problems I know I have tools to help me!*

The researcher realised more than ever after the interviews that the participants needed to work with real work problems and decisions to help them understand that they needed to improve their thinking skills in the changing environment in which they had to operate on a daily basis. Perkins (1992) argues for the development of dispositions that are a culturally based account of development in cognitive ability.

In response to the question whether they had become aware of their thinking, they all acknowledged that they had the ability to improve it, but that it was difficult to break old habits. Good analytical thinking and being critical when faced with a problem had been rewarded in the organisation for quite a long time but they had not been rewarded for thinking creatively and coming up with new solutions to old problems. The researcher realised that this was a cultural issue and should be addressed at senior management level also.

4.2.3. Observations

The researcher made observations in the workplace of the participants' thinking skills in their day-to-day activities as well as in management meetings where they had to make decisions at an organisational level and plan strategically. They had specific meetings where they planned strategically for implementing new systems and processes and this gave the researcher the opportunity to observe their thinking and to determine whether they used the tools they had been trained in. The researcher made use of field notes to note down what had been observed.

The researcher plays a specific role in the business unit as the human resources consultant and is part of the management team. This enabled the researcher to play an active role when needed to prompt the participants to use the newly learned thinking tools. The researcher played the role of a participant observer. The researcher had to place greater emphasis on depth rather than on breadth of data. Emphasis was placed on the holistic understanding, in which the individual things being studied were examined in terms of their relationships with other parts, and with the whole event or culture (Robson, 1993; Denscombe, 2000).

After the first training session on thinking skills and thinking tools, the participants did not use the tools spontaneously. They had to make a difficult decision on implementing a new system and it would influence their processes and the staff. It could have resulted in job losses. They did not spend enough time on generating alternatives of implementation and the researcher prompted their thinking by asking the question: "Have you considered all factors in the implementation

of the system?" Once the question had been asked, the participants (managers) that had attended the Thinking Skills Programme realised that they had not considered all the options and started to explore them. The process was good, but the senior manager (who was not on the Thinking Skills Programme) was not satisfied with the time spent on exploring all the factors that might influence the process. He asked them to come to a conclusion as they did not have the time to spend on one issue.

The participants (managers) were quite disappointed and were not satisfied with the outcome, but had to acquiesce to the senior manager's decision. The researcher realised once again that the senior management group had to be consulted on the issue of effective thinking in the work environment.

The researcher observed the participants when they were faced with difficult problems. They analysed the problem, but struggled to look beyond the obvious answers at hand. The participants (managers) were operating in the problem-solving stage of cognitive development as they were seeking a solution for a specific presented task, but had not moved to the stage of creative thought in seeking a solution (Arlin, 1975:603).

4.2.4 Field notes

Field notes (Addendum G) were taken of the participants' thinking skills and thinking dispositions as demonstrated in their behaviour and thinking during management meetings and at a strategic planning conference. This was done after the pre-assessment. The field notes were taken to support the findings in the observations and semi-

structured interviews. The researcher took the field notes directly after observing the participants to overcome the factor of failed memory.

It was captured in the field notes whether the participants had implemented the thinking dispositions and thinking tools during and after they had been trained on the Thinking Skills Programme.

4.2.5 Post-assessment

The information in the post-assessment was gathered from participants (n=20) that participated in the intervention. The post-assessment was conducted six months after the completion of the programme. Only 20 of the initial 30 who had taken part in the intervention gave feedback. The reason for this was that five of the participants had moved to another part of the business, while three had resigned because of the restructuring process in the business unit. Two participants gave feedback via an unstructured interview.

The main categories were derived from the questionnaire and the sub-categories were identified from the statements made in the open-ended questions asked in the structured questionnaire. This was done with content analysis (see page 138). The researcher decided on the units of analysis (Neuman, 2000:296). The units that were identified were reflected in the sub-categories that emerged from the categories. With content analysis, the researcher can compare content across many texts and analyse it with quantitative techniques (e.g. graphs and tables). In addition she can reveal aspects of the text's content that are difficult to see (Neuman, 2000:293).

The categories identified in the post-assessment are presented in the table below. The category "Day-to-day activities" was added to the findings as it became evident in the semi-structured interviews and observations that it was an important need to think more effectively on a daily basis. The seventh category, Relationships, was also added, but no feedback was gathered from the open-ended questions.

Table 4.2: Categories in post-assessment

Category	Sequence in appearance in Chapter Four.
Category one: Problem solving	Page 150
Category two: Decision-making	Page 155
Category three: Creativity	Page 159
Category four: Solving conflict	Page 163
Category five: Strategic planning	Page 167
Category six: Day-to-day activities	Page 171
Category seven: Relationships	Page 175

Category one: Problem solving

Sub-categories:

- Come up with more than one idea.
- Other factors were taken into consideration - solve problems more effectively.
- Look at the bigger picture.
- Used other people's views.
- Used the tools to solve problems.

The statements of the participants that indicated the sub-categories were the following:

Come up with more than one idea:

i.   *I personally make use of the thinking methods … it is easy to come up with more than one idea to resolve problems.*

ii. *Was able to generate more solutions to problems.*

iii. *Provide myself or a team with more options to choose from when seeking a solution or idea.*

iv. *Find solutions with many alternatives.*

Other factors were taken into consideration - solve problems more effectively:

i.   *Some problems were effectively solved because other factors were taken into consideration.*

ii. *Take into account factors that could hinder my process.*

iii. *I approach problems/situations from a different angle and find it easier to get the required information or answers.*

iv. *It certainly makes problem solving a lot easier.*

Look at the bigger picture:

i.   *Purely because I reflected on impacts and bigger picture items that would impact on the solution.*

ii. *Using the tools, makes you look at things in a bigger context and highlights areas you never previously considered.*

iii. *Combine all the information and get the bigger picture.*

iv. *Try to see the bigger picture.*

v.   *Do not become part of the problem.*

Used other people's views:

i.   *Breaking down the problems using more of other people's*

views/inputs helped us get a better grip on what had to be done.

ii. *The tools enabled me to get the staff involved (by using the tools) in order to jointly solve problems.*

iii. *Depending on the solution, consider OPV (Other People's Views); consider the implications, consequences and how to deal with them.*

Used the tools to solve problems:

i. *I personally make use of the thinking methods.*

ii. *Using the tools, makes you look at things in a bigger context and highlights areas you never previously considered.*

iii. *Tools provided structure to address questions in a group.*

iv. *The tools enabled me to get the staff involved (by using the tools) in order to jointly solve problems.*

v. *Use your ruler and the tools given to us for problem solving.*

Problem solving can be viewed as involving four stages: (1) comprehending the problem, (2) developing or recalling a solution, (3) making use of that solution, and (4) evaluating the consequences (Woolfolk, 1990:267). The responses of the participants were captured in content analysis within this framework.

Four participants indicated that they spent more time on generating more options when they had to solve a problem. They spent more time on developing a solution by involving others and breaking the goal of solving the problem into subgoals. The subgoals were not specifically mentioned in their responses but they indicated they spent more time on generating options. Six participants spent more time on focusing on other factors that would influence the problem. Two participants

used the thinking tools in solving the problem and it indicated the use of the thinking disposition take time to think. Five participants used the thinking disposition to look beyond the obvious. Seven participants used the tools and thinking dispositions to solve problems more easily as they saw the bigger picture. The participants as adult learners fitted the abstract thinking into the concrete limitations of life (Tennant, 1988:79). One key factor in being able to adapt to new ways of thinking is the ability to accept and even thrive on contradiction (Merriam & Caffarella, 1991). The **awareness of their thinking process** in solving problems became more evident. Creative thinking was evident in solving problems. The creativity was noted in the shift to look at the bigger picture and to see things they had not seen in the past. This corresponds with Sternberg's (1999) view of the use of knowledge to create new insights. The awareness of the use of creative thinking became part of their thinking process. Three participants indicated that they were more creative in solving problems.

A summary of the findings is presented in Figure 4.7.

Figure 4.7: Post- assessment: problem solving

Post-assessment: Problem solving
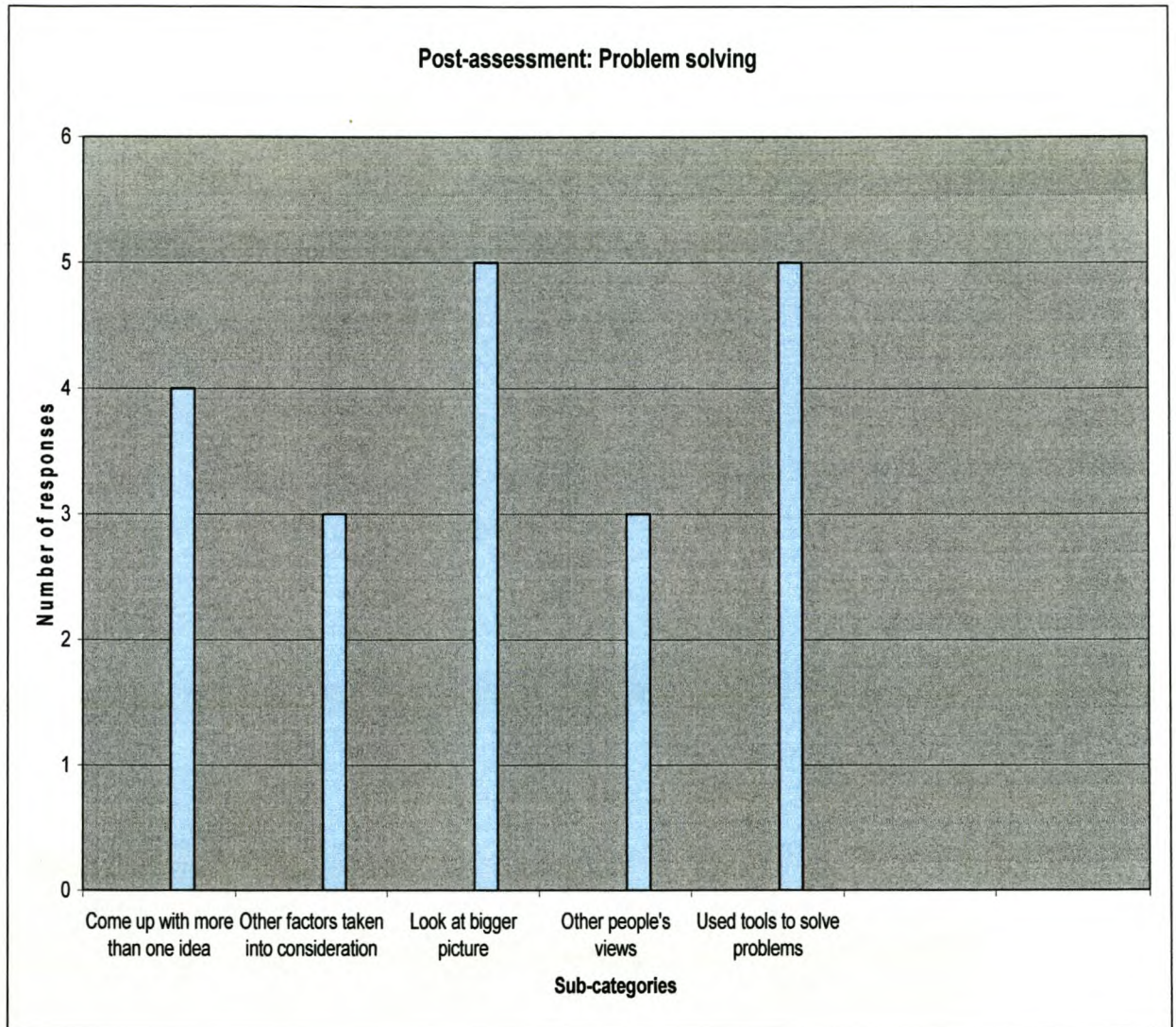
Category two: Decision-making

Sub-categories:

- Probe for possible solutions - using the tools.
- Draw in other people's views.
- Consider all factors in decision-making.
- Focus on the consequences.
- See the bigger picture.

The statements of the participants that indicated the sub-categories were the following:

Probe for possible solution - using the tools:

i.   *By using the tools the chances for reaching solutions are greater.*

ii. *I would like to think that decisions are more effective with the tools.*

iii. *They (the tools) let one get all the facts before a decision is made.*

iv. *Make a list of the positive, negative and interesting facts involved in the decision.*

Draw in other people's views:

i.   *Get others involved in solving the problem that requires a decision.*

ii. *Draw in other people's views and consider the impact (i.e. budgets, people that may be involved) the decision will have.*

iii. *That whatever work-related problems you may have, may not only be what you are experiencing and that once you have all your facts you can seek advice from others/colleagues who may be experiencing similar problems.*

iv.	The input from everyone would be used to make the final structure changes.

v.	Depending on the situation, consider OPV (Other People's views), consider the implications, consequences and how to deal with them.

vi.	Do an OPV (Other People's Views).

Consider all factors in decision-making:

i.	Discuss in your team the different ways that would assist you in making a decision.

ii.	With all the factors that you need to consider when using the thinking tools, decision-making is not such a big deal anymore.

iii.	Will consider all factors as we will follow a logical process.

iv.	Decisions are based on more information or different ways of thinking being included in the input used to make the decisions.

v.	Do a CAF (Consider All Factors).

Focus on the consequences:

i.	I am now looking for more than one solution and I also focus on the consequences.

ii.	Depending on the situation, consider OPV, consider the implications, consequences and how to deal with them.

See the bigger picture:

i.	Do not become part of the problem that forms part of the decision.

ii.	By listing/recording everything, it was always better to see the bigger picture and keep it in mind when making a decision.

iii.	They (the tools) let one get all the facts before a decision is

made.

iv. *Depending on the situation, consider OPV, consider the implications, consequences and how to deal with them.*

The four participants used the thinking tools to help them make decisions and it was an indication of their **awareness** of their thinking process to look wider than what they had seen when initially faced with the problem (thinking disposition). They focused on the facts before they made a decision. They focused considerably on drawing in other people's views before they made a decision. Six participants indicated that they asked other people they worked with to give input in their decision-making process. Five participants looked beyond what was at hand and considered all factors in making a decision. They implemented the thinking dispositions and thinking tools in the process. They used the thinking tool Consequence and Sequence to make a decision and it was an indication of looking beyond what they might have thought the answer would be. Four participants indicated that they saw the bigger picture when they had to make a decision and they didn't become part of the problem. It was noticeable that the participants were more aware of their thinking processes and that they needed to spend more time on thinking a process through before they could come to a conclusion on how to make a decision.

A summary of the findings is presented in Figure 4.8.

Figure 4.8: Post-assessment: decision-making
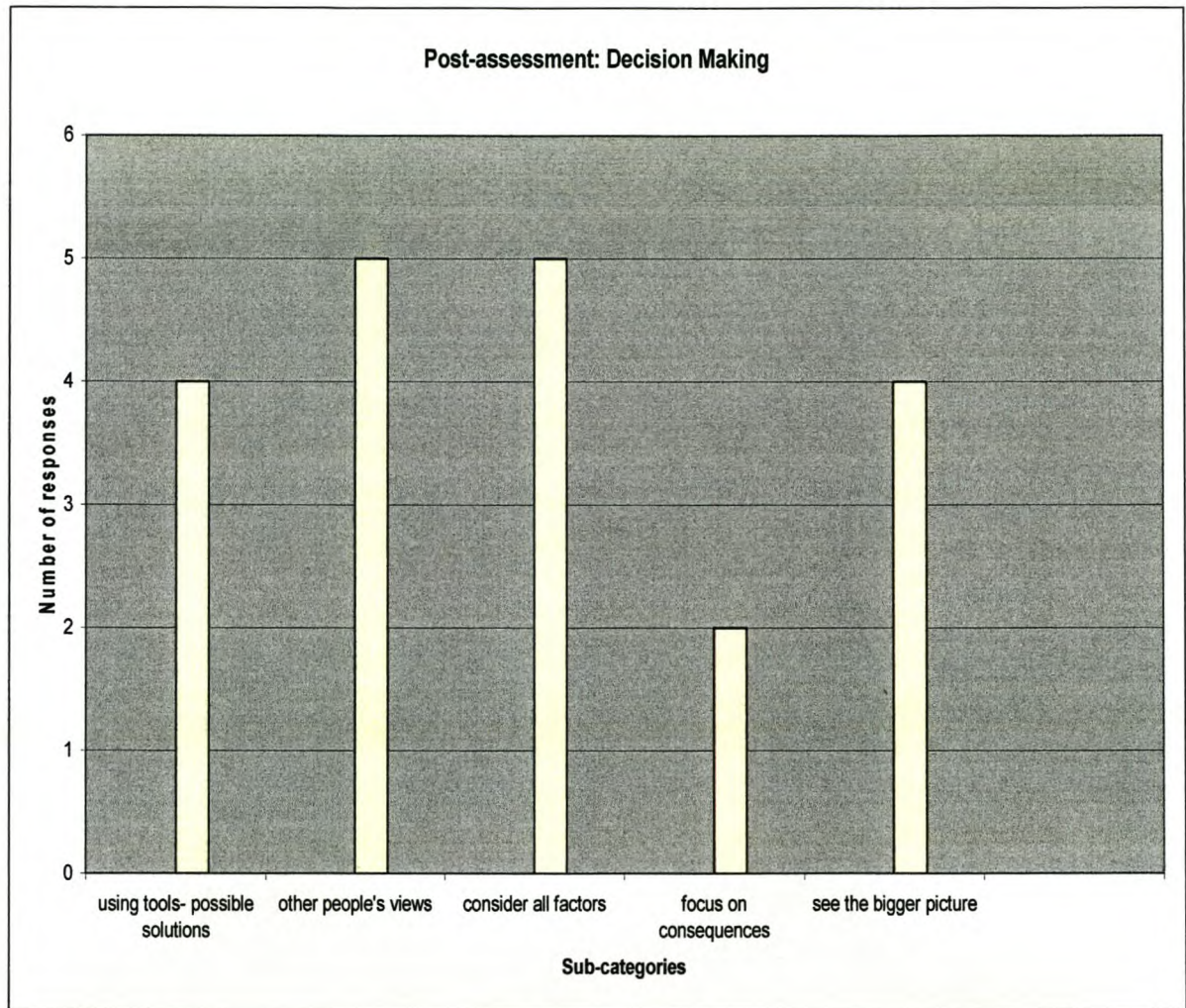
Category three: Creativity

Sub-categories:

- Use the thinking tools to be more creative.
- Link different ideas.
- Look beyond the obvious.
- Create alternatives/possible solutions.
- Don't use creativity in the workplace.

The statements of the participants that indicated the sub-categories were the following:

Use the thinking tools to be more creative:

i. *I could teach others to use the thinking tools, because they are very simple.*

ii. *We are busy with designing a better productivity measurement but there are problems. I cannot give any success stories other than that we are using the tools to find an effective solution.*

iii. *Creativity was never one of my strong points. Still isn't, but using the thinking tools helps creating some ideas you may never have thought of in the past.*

Link different ideas:

i. *It helped (the tools) by building on others' ideas and linking different ideas.*

ii. *Provides structure in eliciting input from the working group.*

Look beyond the obvious:

    i.   *Looking beyond the obvious and gaining more input.*

Create alternatives/possibilities:

    i.   *You are able to gather a lot of detail/ideas so that the best solution can be found.*

    ii.   *More ideas will be generated and more factors will be considered.*

    iii.   *Think of alternatives.*

    iv.   *Identify possible solutions.*

Don't use creativity in the workplace:

Six participants indicated that they did not need to be creative in their jobs and they did not use the tools to be creative.

Three participants indicated that they had used the tools to be more creative in solving problems and create new ways of improving the processes in the business environment.

The participants' replies indicated that they were aware of creating more alternatives and possibilities to identify an **original** solution to a problem or challenge. Examples of this thinking were:

It helped (the tools) by building on others' ideas and linking different ideas

and

Looking beyond the obvious and gaining more input.

Four participants indicated that they generated more alternatives to find better solutions to problems.

You are able to gather a lot of detail/ideas so that the best solution can be found
and
More ideas will be generated and more factors will be considered.

They modified their past experience to fit unique aspects of the present situation. This is an indication of creative thinking (Weisberg, 1993, 1995).

Creativity was never one of my strong points. Still isn't, but using the thinking tools helps creating some ideas you may never have thought of in the past.

There was an improvement from the pre-assessment where there was little evidence of creativity and the awareness of how to be creative in the workplace. The thinking disposition to think clearly and precisely was evident in their thinking as indicated, in that the thinking tools helped them to create structure in their thinking. An example of their thinking was:

Provides structure in eliciting input from the working group.

Six participants indicated that they did not need to be creative in their jobs and they did not use the tools to be creative.

The participants' replies did indicate an awareness of being creative, but it is not evident that they used the tools to design a new way forward. They still need more training and constant reminders to use the tools effectively in order to be creative in the workplace.

A summary of the findings is presented in Figure 4.9.

Figure 4.9: Post-assessment: creativity

Post-assessment: Creativity
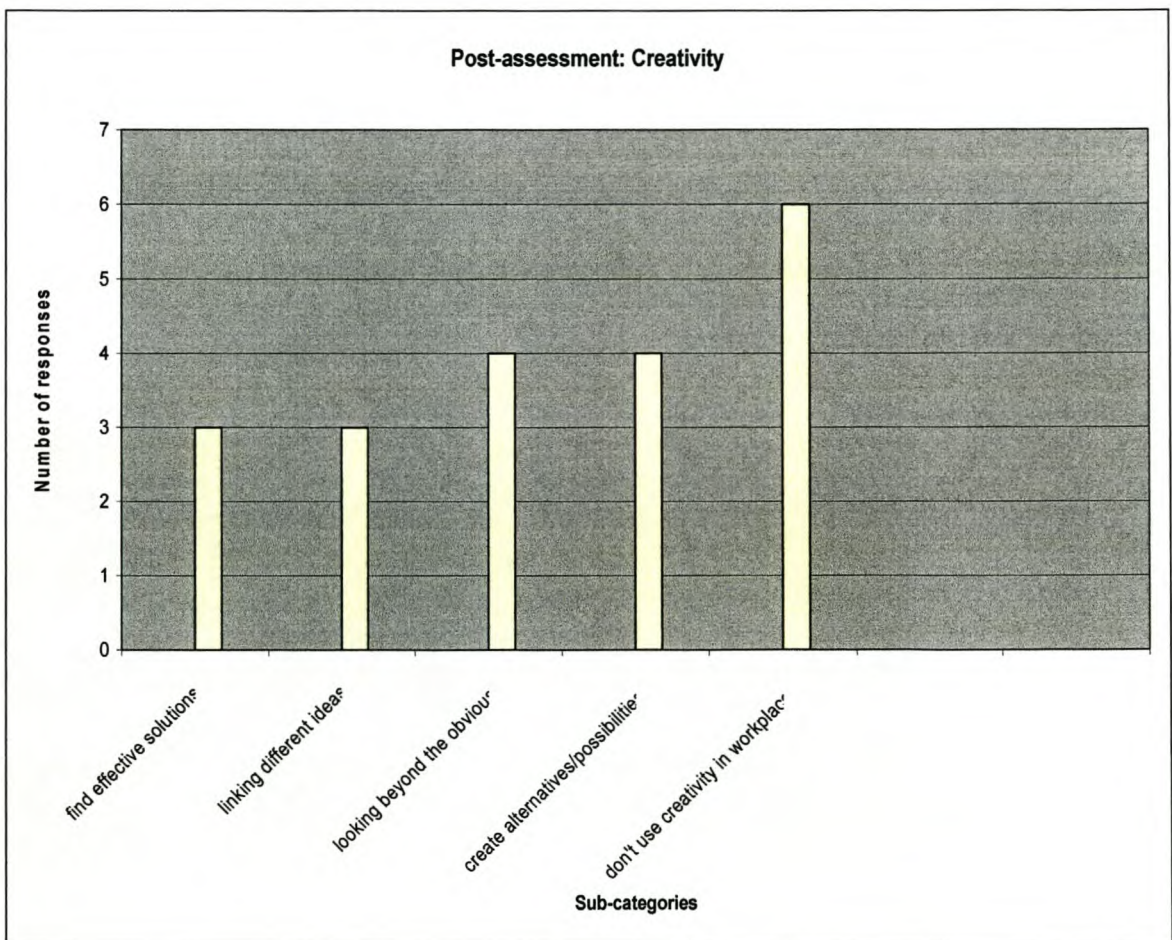
Category four: Solving conflict in the workplace

Sub-categories:

- Consider other people's views.
- Manage conflict in a more focused and organised way.
- Look beyond the obvious to solve conflict.
- Identify consequences.

The statements of the participants that indicated the sub-categories were the following:

Consider other people's views:

i. *I focus more on the positive and interesting facts than on the negatives (PMI-Positive Minus Interesting).*

ii. *Will weigh up the pros and cons as well as the interesting.*

iii. *The tools provided have given the knowledge of how to best solve disputes or difference in opinion between colleagues.*

iv. *Getting everyone's input to conflict has helped smooth over some difficult situations. (Primarily considering others point of view as well.)*

v. *It is amazing how it helps in conflict situations. Instead of just addressing the person (negative influence) and leaving it at that, it helps the person understand where you come from and what the impacts could be. They also respect the fact in which you handle the situation (positive contribution).*

vi. *Use the ruler and the tools given to us to solve conflict.*

vii. *Consider the view of the other people involved in the conflict.*

viii. *Draw in other people's view in the conflict situation.*

Manage conflict in a more focused and organised way:

i.   *Made you consider all aspects of the issue at hand and pinpoint problem areas and address them accordingly.*

ii. *The tools provide a structure and create an opportunity to review the issues objectively and hence remove the issues from the individual.*

iii. *Will follow a process and leave out the emotions - helps you stick to the problem.*

Look beyond the obvious to solve conflict:

i.   *Will identify possible solutions to solve the conflict.*

ii. *Focus on all the facts and consider all the factors involved in conflict.*

iii. *To solve most conflict situations one has to CAF (Consider All Factors) and consider OPV (Other People's Views).*

iv. *Made you consider all aspects of the issue at hand and pinpoint problem areas and address them accordingly.*

Identify consequences:

i.   *Look at the consequences of solving the conflict in a positive way.*

Four of the participants replied that they did not use the tools in the work situation to solve conflict.

Eight of the participants replied that they used the tools more effectively to solve conflict by looking at other people's views and looking at the positive, negative and interesting aspects of the situation. It influenced the way they managed their colleagues and

subordinates in a positive way.   As one participant replied:

It is amazing how it helps in conflict situations. They also respect the way in which you handle the situation.

Thinking dispositions were internalised as they helped to solve conflict, and enhanced thinking more effectively, in an organised and structured way. The participants operated on the fifth-level of problem solving (Arlin, 1975). They replied as follows:

The tools provide a structure and create an opportunity to review the issues objectively and hence remove the issues from the individual.

Another thinking disposition that was internalised was to think beyond the obvious by using the different tools to look beyond what was presented.

Focus on all the facts and consider the all the factors involved in conflict
and
To solve most conflict situations one has to consider all factors and look at other people's views.

A summary of the findings is presented in Figure 4.10.

Figure 4.10: Post-assessment: conflict handling

Post-assessment: Solving conflict in the workplace
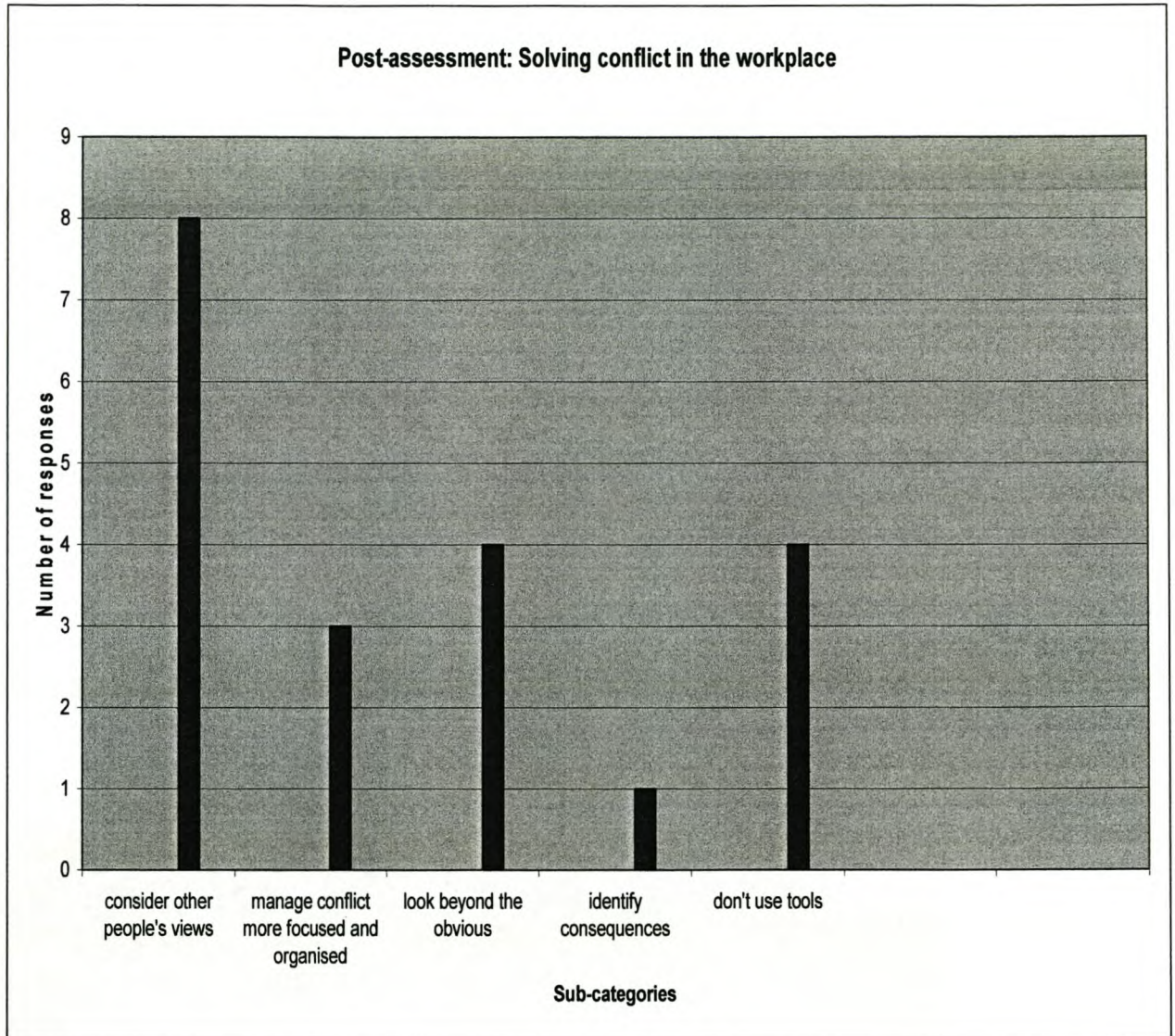
Category five: Strategic planning

Sub-categories:

- Come up with more solutions.
- Get input from larger group to influence decisions.
- Use tools to do strategic planning.
- Use tools to plan for new initiatives.

The statements of the participants that indicated the sub-categories were the following:

Come up with more solutions:

i.   *Yes - once again it assists with a larger input and different ideas used to strategise- use of C & S (Consequence and Sequence). The "may we" or "should we" is very helpful in seeking direction.*

ii. *Yes - I use more than one thinking method and this enables me to come up with more solutions.*

Get input from larger group to influence decisions:

i.   *Yes - once again it assists with a larger input and different ideas used to strategise.*

ii. *Have used the tools to engage the whole department in a strategic planning session - not done in the past. Very successful.*

Use tools do strategic planning:

i.   *Yes- we will be using it for ways to work around increase of workload.*

ii. *Yes - I now have tools to assist me to do strategic planning better.*

iii. *I have used the thinking tools in my personal life where important decisions and planning needed to be made and it has worked wonderfully.*

iv. *Yes - I use more than one thinking tool and this enables me to come up with more solutions.*

Use tools to plan for new initiatives:

i. *Tools were used to plan a new strategic initiative - a new business was created. All were included in process; numerous options were discussed and explored. Best one was acted upon.*

ii. *We used it at one of our planning conferences and it was very successful.*

iii. *We have used the tools to plan a new way of working; to be more productive. It helped a lot to come up with a different way that was normally quite difficult in the past.*

The thinking tools helped the participants to be more effective in thinking strategically especially when they worked in groups. The group worked in cooperative groups (see Addendum H). This was new to the working environment as strategic planning in the past had been done by a small group of senior managers and the decision was imposed on the rest of the group. They replied as follows:

Have used the tools to engage the whole department in a strategic planning session - not done in the past. Very successful.

The participants generated more solutions than in the pre-assessment when they did their strategic planning and it resulted in new initiatives for the business and enabled growth for the business (Sternberg,

1999).

It was not evident from the feedback whether they had analysed the problems or decisions at length (as they had in the past). They did, however, come up with more solutions when they discussed the way forward. Their replies were:

I used more than one thinking tool and this enables me to come up with more solutions

and

… all were included in the process - numerous options were discussed and explored.

Eight participants responded that they had not engaged formally in strategic planning and commented that they didn't have the opportunity to use the thinking tools in strategic planning.

A summary of the findings is presented in Figure 4.11.

Figure 4.11: Post-assessment: strategic planning
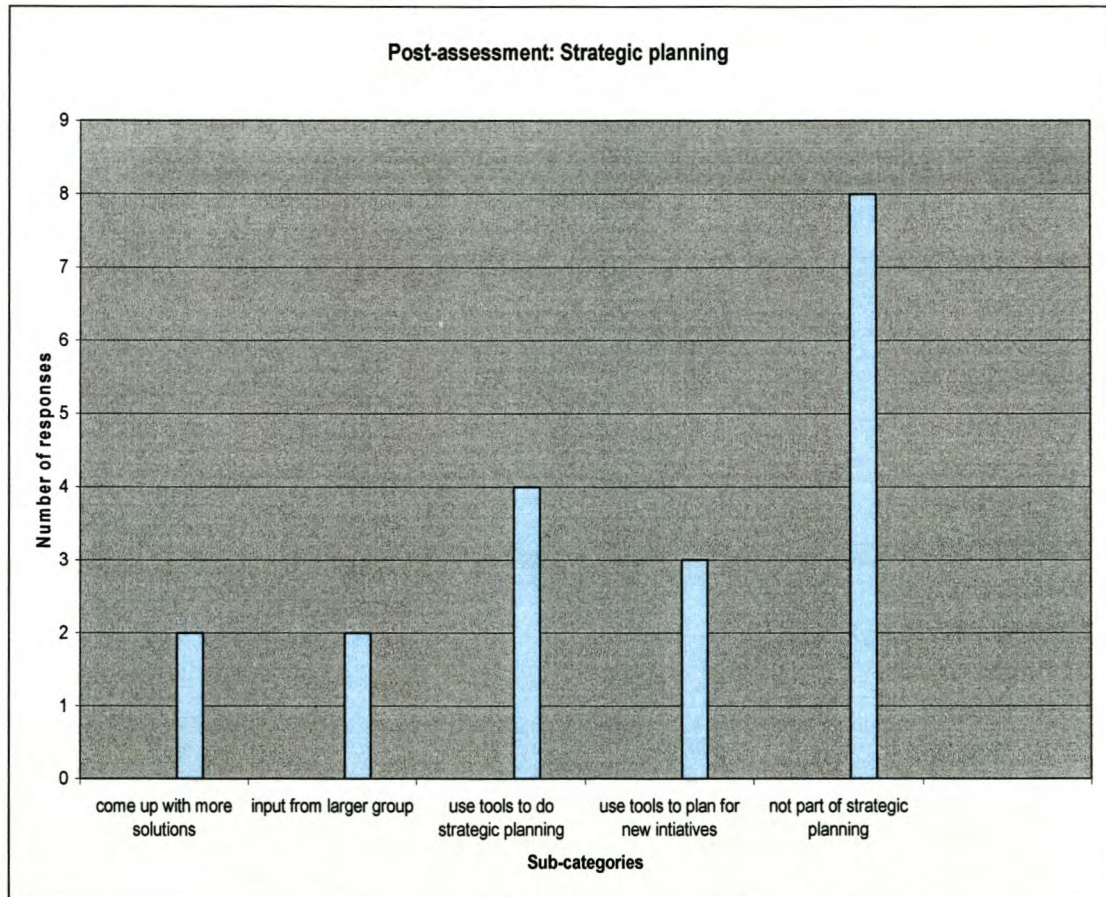
Category six: Day-to-day activities

Sub-categories:

- Consider other people's ideas.
- Make decisions.
- Remove emotions from decisions and conflict.
- Solve problems.

The statements of the participants that indicated the sub-categories were the following:

Consider other people's ideas:

i. *Yes - I respect others' suggestions because I am well aware of the fact that they could have used other methods to arrive at an answer.*

ii. *I use the tools when I am faced with other people's ideas and to incorporate them.*

iii. *I use the tools when others' decisions influence my work environment.*

Make decisions:

i. *I use them when I have to make decisions.*

ii. *When faced with difficult decisions I use the tools.*

iii. *It is just that you approach things differently and don't make decisions without taking relevant and affecting factors into account.*

Remove emotions from decisions and conflict:

i. *I certainly attempt to use systems thinking in order to remove the emotions from the issue/conflict.*

   ii.   *I focus on obtaining the facts when I have to make a decision and not my emotions.*

  iii.   *I use it to great success when I move away from what I feel and focus on the consequences after considering the facts.*

Solve problems:

   i.   *I use the ruler every day when we have to solve problems in the workplace.*

   ii.   *We use the tools often when we are faced with new problems.*

  iii.   *Yes, we are using these tools to solve problems in the work area, i.e., measuring quality.*

  iv.   *I look at the problem wider than what is in front of me, by asking input from others and focus on the positive, negative and interesting.*

   v.   *I used it in a productivity and morale issue with my department and it worked quite well by using the PMI tool (Positive, Negative, Interesting).*

This category was added to the post-assessment as it became evident in the observations and semi-structured interviews that the managers struggled with effective thinking in their day-to-day activities. It was created as another category as it was in the daily operation the managers needed to implement the strategic decisions made at the senior management level.

Three participants indicated that they had used other people's input in their day-to-day activities. Three participants used the thinking tools to make decisions in their daily operation.

On focusing on the issue at hand and not the person – removing emotion from decisions and conflict - three participants indicated that they had used the tools to help them. In solving problems in the daily operation, five participants indicated that they had used the thinking tools and thinking dispositions to help them to think more effectively.

The rest of the participants, six, commented that they hadn't used the thinking tools in their day-to-day activities.

It became evident from the feedback that the participants could use the tools not only in specific planning sessions or when faced with specific problems or decisions, but also very successfully in their day-to-day activities. **Awareness** was created to think more effectively in everyday situations.

A summary of the findings is presented in Figure 4.12.

Figure 4.12: Post-assessment: day-to-day activities

Post-assessment: Day-to-day activities
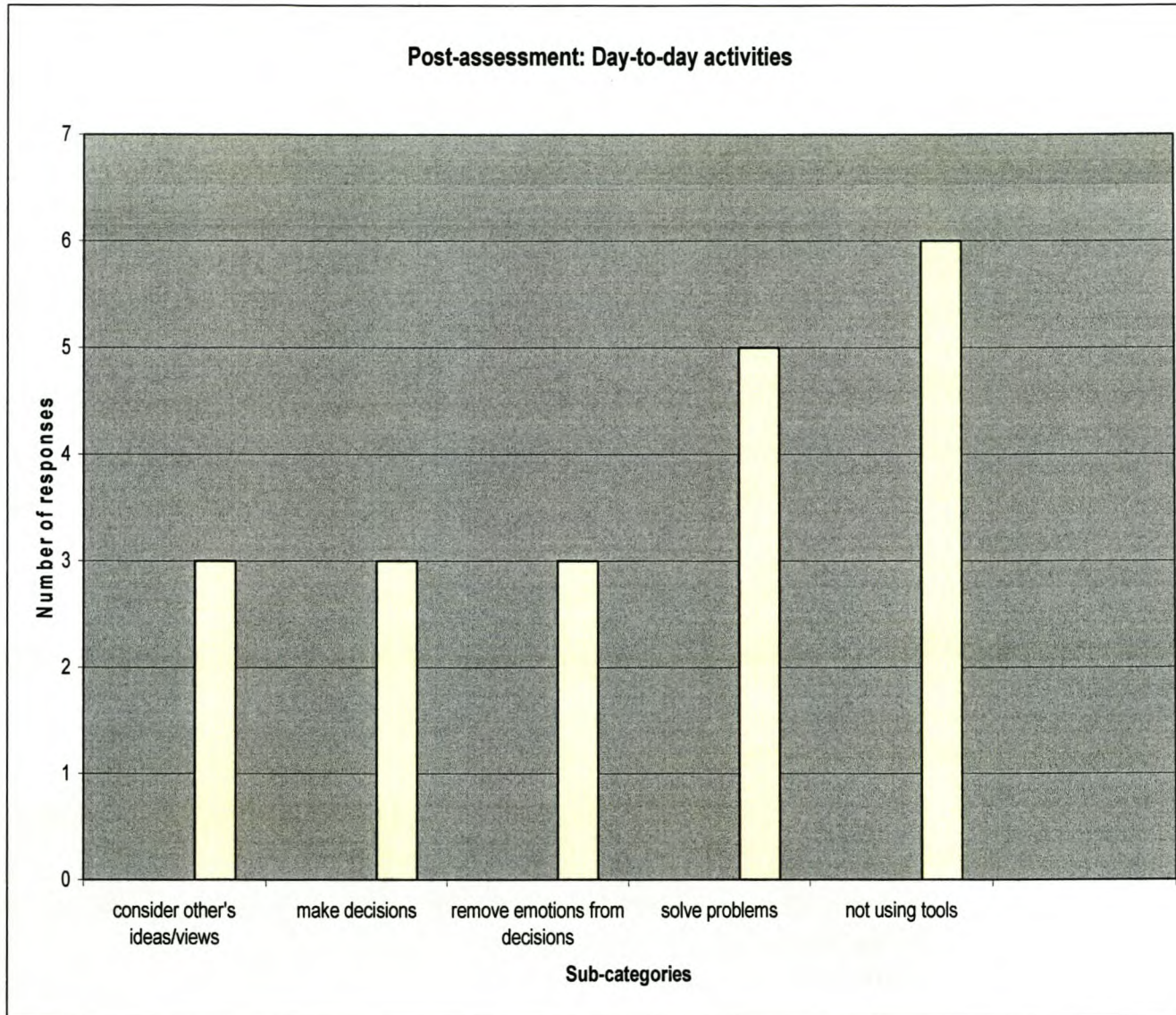
Category seven: Relationships

The responses from category seven did not deliver sub-categories as 18 of the participants indicated that they didn't use the thinking tools **specifically** in relationships in the work environment. One participant replied that the relationships issue was noted in her response in the category "Day-to-day activities" in managing conflict.

One subject replied that she did use it:

In making decisions at the management level we attempt to use these thinking skills, and another subject replied as follows:
Yes, I first listen to the 'problem' and then my thinking skills kick in.

4.3 DISCUSSION

4.3.1 Introduction

The results of the pre- and post-assessments are discussed with reference to the literature study, semi-structured interviews and observations made in the work environment by the researcher.

4.3.2 Pre- and post-assessment results

"A vital part of the reflections undertaken by the qualitative researcher will be the attempt to identify patterns and processes, commonalities and differences" (Miles & Huberman, 1984:9).

In the process of determining the patterns and processes in the pre-assessment, the researcher looked for themes or interconnections that recurred between the units and categories that were emerging from the data (Neuman, 2000:294).

The categories were pre-determined in the **pre-assessment** by the

open-ended questionnaire, which focused on specific cognitive functions, such as problem solving and decision-making.

The sub-categories that emerged were derived from the frequency of appearance in the answers of the participants in the questionnaires (Neuman, 2000:293).

The sub-categories that emerged from the units were done through content analysis. Content analysis is the textual analysis that involves comparing, contrasting, and categorising a corpus of data (Schwandt, 1997:21; Neuman, 2000:293-296).

The categories identified in the pre-assessment were:
- Category one: Problem solving.
- Category two: Decision-making.
- Category three: Conflict handling.
- Category four: Applying creative thinking in the workplace.
- Category five: Strategic thinking.

The units identified throughout the questionnaires that indicated the sub-categories were analysis and identification of the problem. The participants were quite familiar with analysis when they were faced with problems or conflict or when they had to make a decision. This is an indication of the culture of the organisation as well as the thinking system of how thinking was taught in the education process. De Bono (1996:11) emphasises this thinking system by stating: "It is this thinking system that influenced the way problems were solved in the twentieth century and if analysis, criticism, judgement and argument were used, it was sufficient. This however, in the twenty-first century

is not enough as the environment is changing and demanding more than mere analysis and critique of what is wrong."

The unit of involving others in the process of problem solving or decision-making did emerge as well, but not as frequently as analysis.

They did reply that they considered options, but mostly it was one solution to solve a problem or to make a decision/handle conflict. This is relevant in the work environment where there is evidence that if a solution doesn't solve the problem; it causes problems in their processes, with the resultant loss of capital as they have to shut down operations that were not cost-effective. This sometimes even results in job losses. The observations made in the workplace had evidence of this as well. In conflict handling the solution was influenced by the emotions of the person. One of the responses was:

*Identify **a solution** and look at the pros and cons and decide which will suit myself and other parties best. Taking into account my morals as well.*

Creativity or the absence thereof, was noticeable as the participants indicated that they did not need to be creative in the workplace. Twenty participants indicated this state of mind.

Two participants indicated that they used expertise in the field to be creative, but that the process did not continue. They did not explore more ideas to implement creative ideas. One subject indicated a strong stance by not designing anything new:
Establish whether any work has been done previously. Use this rather

than re-inventing the wheel.

The sub-categories that emerged to build the category of strategic thinking were mostly to identify the end result and involve others in the process. Only three participants indicated that they looked for options and two that they considered alternatives.

This way of thinking, to analyse and identify the problem or cause of the problem, is how the participants are trained to think throughout their schooling system. It is encouraged in a work environment where accountants and actuaries drive the business. They require analysis of problems and identification of causes of problems. The participants operate in a society where analysing is an important thinking competency and the origin of thought is in the individual and in society and represents a necessary synthesis in the development of thought toward maturity (Riegel, 1973:350). This indicated the need to teach more effective thinking skills. This ties in with De Bono's (1996:12) view: "Most of the major problems in the world will not be solved by yet more analysis. There is a need for design."

This corresponds with De Bono's (2000:274) observation:

Traditional thinking is concerned with recognising standard situations and applying standard solutions. In a changing world, with increasing opportunities (technology) and increasing pressures, there is also a need for the "what can be" type of thinking. This is thinking that is creative and constructive. This is thinking that does not merely seek to identify "what is" but also to bring about new things that have not yet existed.

There was a clear lack of creative thinking, insight and craftsmanship. This is needed in a changing environment. Costa (1985) states:

> Managers who need to operate in the changing environment are faced with such situations where they don't have the immediate answer. They need to behave intelligently when confronted with challenging conditions that demand strategic reasoning, insightfulness, perseverance, creativity, and craftsmanship to resolve complex problems.

From the sub-categories that emerged from the units it was clear that the participants lacked the characteristics of effective thinkers as they spent most of their time identifying and analysing the problem and criticising what was wrong. Instead they needed to use their thinking abilities by increasing their use of alternative strategies of problem solving. They needed to collect evidence to indicate that their problem-solving strategy was working, and if one strategy did not work, they needed to back up and try another (Feuerstein, et al., 1980; Sternberg, 1984; Ennis, 1985; Glatthorn & Baron, 1985; Perkins, 1985).

The categories in the **post-assessment** were determined by the open-ended questionnaire that focused on the same areas as in the pre-assessment with added categories that were derived from the semi-structured interviews and observations made in the workplace.

The categories in the post-assessment were:
- Category one: Problem solving.

- Category two: Decision-making.
- Category three: Creativity.
- Category four: Solving conflict in the workplace.
- Category five: Strategic planning.
- Category six: Day-to-day activities.
- Category seven: Relationships.

In the post-assessment the units that emerged were the awareness of looking at the bigger picture when faced with problems, decisions, solving conflict and thinking strategically. They replied as follows:

Using the tools makes you look at things in a bigger context and highlights areas you never previously considered.

Combine all the information and get the bigger picture.

More involvement of other people's views became evident in solving problems and especially in strategic thinking. The results from inclusion of others' views resulted in growth in the department. To include all management levels in cooperative groups in planning strategically is new to the organisation and the results were positive. Examples of this thinking were evident in their responses:

The tools enabled me to get the staff involved (by using the tools) in order to jointly solve problems.

Tools were used to plan a new strategic initiative - a new business was created. All were included in the process; numerous options were discussed and explored. Best one was acted upon.

Getting everyone's input with regard to conflict has helped smooth over some difficult situations primarily considering others' point of view as well.

An awareness of their thinking was evident in their responses. This awareness is important for effective thinking. De Bono (1988) states:

> *This is a matter of insight, realisation, and understanding of what goes on in thinking. If we get to understand the 'landscape' of thinking it becomes easier to find your way around.*

The units that implied this awareness were:

The tools provide a structure and creates an opportunity to review the issues objectively and hence removes the issues from the individual.

I use more than one thinking method and this enables me to come up with more solutions.

Thinking dispositions became evident as units in their responses and emerged as sub-categories (Neuman, 2000:294). The thinking disposition that emerged was thinking beyond the obvious, and they took time to think about the problems or decisions and handling conflict. Perkins et al. (1993:3) stress the importance of acquiring thinking dispositions to think more effectively:

> *All too commonly, people know how to think better about*

something (for instance, to search for more options, consider further evidence, or look at the other side of the case) but are not disposed to do so for one reason or another (for instance, bias, prejudice, impatience, overconfidence, or simply a failure to notice that the situation invites broader and/or more careful thinking).

The units that emerged in their responses to identify the use of thinking tools were the following:

To solve most conflict situations one has to CAF (Consider All Factors) and consider OPV (Other People's Views).

We have used the tools to plan a new way of working; to be more productive. It helped a lot to come up with a different way that was normally quite difficult in the past.

Will follow a process and leave out the emotions - helps you stick to the problem.

I use it to great success when I move away from what I feel and focus on the consequences after considering the facts.

These units on the use of thinking tools emerged to become sub-categories.

The feedback from the questionnaire indicated awareness and in some cases even implementation of creativity in the workplace.
I look at the problem wider than what is in front of me, by asking input

from others and focus on the positive, negative and interesting.

We are busy with designing a better productivity measurement but there are problems. I cannot give any success stories other than we are using the tools to find an effective solution.

The participants reflected more on their thinking when they had to solve problems and had to make decisions. The feedback indicated that they managed conflict handling more effectively by thinking more effectively when they dealt with the situation. The units in their responses emerged in sub-categories.

I am now looking for more than one solution and I also focus on the consequences.

It is amazing how it helped in conflict situations. Instead of just addressing the person (negative influence) and leaving it at that, it helps the person understand where you come from and what the impacts could be. They also respect the way in which you handle the situation (positive contribution).

The tools provided a structure and creates an opportunity to review the issues objectively and hence removes the issues from the individual.

Triangulation with findings from the literature review and semi-structured interviews as well as the post-assessment, provided evidence that the participants used their thinking skills more effectively as they portrayed effective thinking characteristics.

Feuerstein et al. (1980), Sternberg (1984), Ennis (1985), Glatthorn and Baron (1985) and Perkins (1985) state that human beings who behave intelligently and have effective thinking skills share identifiable characteristics. One of these characteristics is listening to others with understanding and empathy; accurately expressing other people's concepts, emotions and problems - all are indications of listening behaviours. This characteristic became evident in the emerging units of the feedback from the questionnaires:

I respect others' suggestions because I am well aware of the fact that they could have used other methods to arrive at an answer.

I used it in a productivity and morale issue with my department and it worked out quite well by using the PMI tool (Positive, Negative, Interesting).

In the semi-structured interview a number of the participants randomly interviewed stated that they had the ability to improve their thinking skills although it was difficult for them to break old habits of thinking.

The **post-assessment** feedback categories indicated that a shift in effective thinking had taken place in the participants. **The most significant difference in their thinking was the awareness of their thinking and their realisation that they needed to involve others in solving problems and making decisions and that they needed to take time to think before they solved conflict.**
Figure 4.13 illustrates the development in the awareness in the participants' effective thinking after the thinking skills had been

Figure 4.13: Significant development in effective thinking

PRE – ASSESSMENT		POST – ASSESSMENT
Focus on analysing problems and decisions; Little involvement of others One solution Very little creativity	→	Shift in the awareness of thinking- use thinking tools to improve thinking High involvement of others to share alternatives and create options and choices Creative ideas in processes
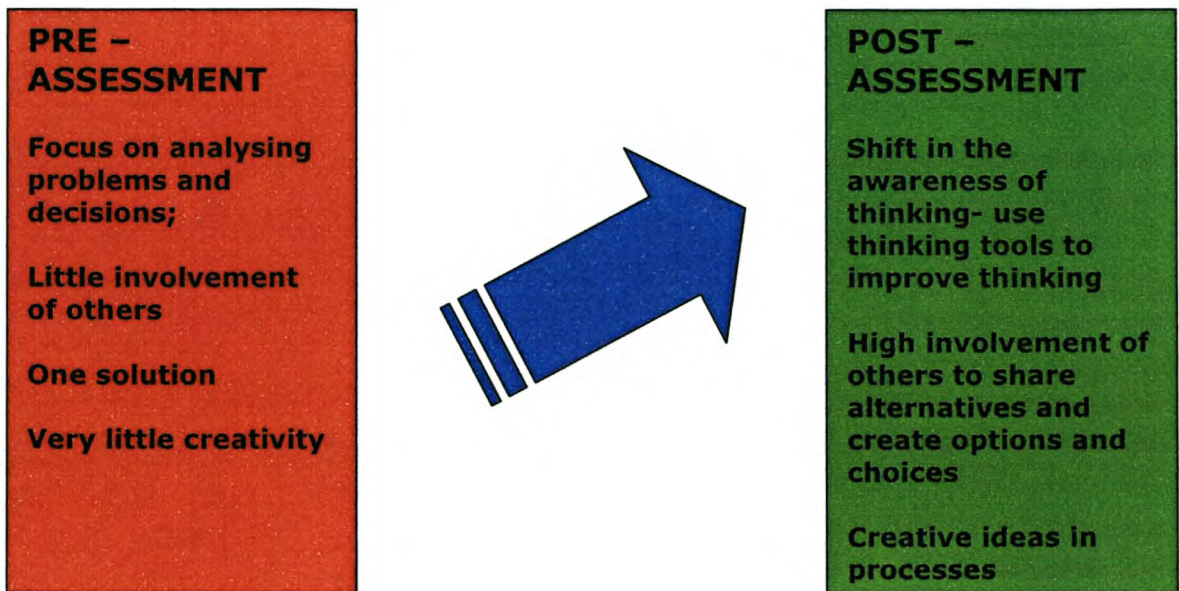
4.4 DISCUSSION OF FINDINGS

The findings of the pre- and post-assessment are presented in tables to detect the influence of the intervention on the effective thinking of the participants. The underlying meaning of the sub-categories indicated the shift that took place in the participants' cognitive development in becoming more effective thinkers (Rybash, Hoyer & Roodin, 1986:121; Neuman, 2000).

4.4.1 Category one: Problem solving

Table 4.3: Problem solving

Pre-assessment (n=30) Sub-categories	Post-assessment (n=20) Sub-categories
i. Identify the problem	i. Come up with more than one idea
ii. Analyse the problem	ii. Other factors were taken into consideration - solve problem more effectively
iii. Discuss the problem	iii. take time to think - reflect on their thinking
iv. Involve other parties in discussion	iv. Look at the bigger picture
v. Look at options and solutions	v. Used other people's views
vi. There is no analysis of the problem	vi. Used the tools to solve problems
vii. Come up with one solution to solve problem	vii. Think creatively in solving problems
viii. Supply resources to solve problem	
ix. Implementation plan to solve problem	

In the pre-assessment the participants analysed the problem quite effectively and spent time on this thinking activity. They did generate options and alternatives, but came up with one solution.

The intervention did influence their effective thinking as they focused on the **bigger picture** and involved others in solving the problem. They **reflected** on their thinking while solving the problem, which is evidence of effective thinking. They used **the tools** to help them solve problems that meant that they were thinking more effectively (and did not rely on old thinking methods but implemented more effective thinking skills and thinking dispositions) and were **aware** of their thinking. An influence of the intervention was that they were

creative in solving the problem, which was not evident in the pre-assessment.

The participants used effective thinking skills after the intervention and it was evident in the identifiable characteristics of people with effective thinking (Feuerstein *et al.*, 1980; Sternberg, 1984; Ennis, 1985; Glatthorn & Baron, 1985; Perkins, 1985). Two of these characteristics are:

- Decreasing impulsitivity: When it is important to do so, people with effective thinking skills think before they act. As adult learners become less impulsive, it can be observed that they clarify goals, while planning a strategy for solving a problem.
  (Responses from the participants: *Using the tools, makes you look at things in a bigger context and highlights areas you never previously considered.)*

- Ingenuity, originality, insightfulness: creativity: They often try to create different solutions to problems, examining possibilities from many angles (lateral thinking). They need to project themselves in different roles, starting with a vision and working backwards to "their solution".
  (Responses from the participants: *I approach problems/situations from a different angle and find it easier to get the required information or answers.)*

4.4.2 Category two: Decision-making

Table 4.4: Decision-making

Pre-assessment (n=30)	Post-assessment (n=20)
Sub-categories	Sub-categories
i. Analyse the problem	i. Probe for possible solutions-using the tools
ii. Look at the consequences of the decision	ii. Draw in other people's views
iii. Implement one solution	iii. Consider all factors
iv. Weigh up alternatives	iv. Look for more than one solution.
v. Consider all factors	v. Focus on the consequences
vi. Generate more than one solution/option	vi. See the bigger picture
vii. Take other people's views into account	

The participants were thinking effectively in the pre-assessment as they did weigh up alternatives and generate more than one solution and take other people's views into account. They did, however, spend most of their time on analysing the problem they had to make a decision on.

The influence of the intervention in the post-assessment was evident once again in that they focused on the bigger picture and they were aware of their thinking (meta-cognitive thinking) by using the tools in probing for solutions.

More time was spent on gaining input from others, generating options

by investigating various factors, and considering solutions by examining the positive, negative and interesting facts of the decision. Examples of their feedback are the following:

Depending on the situation, consider OPV (Other People's Views), consider the implications, and how to deal with them.

Decisions are based on more information of different ways of thinking being included in the input used to make the decisions.

By listing/recording everything, it was always better to see the bigger picture and keep it in mind when making a decision.

Make a list of the positive, negative and interesting facts involved in the decision.

4.4.3 Category three: Creativity
Table 4.5: Creativity

Pre-assessment (n=30)	Post-assessment (n=20)
Sub-categories	Sub-categories
i. Weigh up alternatives	i. Find effective solutions
Pre-assessment (n=30)	Post-assessment (n=20)
ii. Ask for different views and advice	ii. Link different ideas
iii. No creativity (20)	iii. Look beyond the obvious
	iv. Gather a lot of detail
	v. Create alternatives/possible solutions
	vi. Don't use creativity in the workplace

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In the pre-assessment most of the participants, 20, indicated that they did not use creativity in the workplace or that they did not find the need to apply creativity. Although they did weigh up ideas and they asked for different opinions, they did not pursue them any further.

The intervention influenced their creative thinking as the participants explored options and linked different ideas; they looked beyond the obvious and created alternatives and possible solutions (Sternberg, 1999:246). They exhibited the characteristics of effective thinkers as described by Feuerstein et al. 1980; Sternberg, 1984; Ennis, 1985; Glatthorn & Baron, 1985; Perkins, 1985):

> *Ingenuity, originality, insightfulness, creativity: They often try to create different solutions to problems, examining possibilities from many angles (lateral thinking). They need to project themselves in different roles, starting with a vision and working backwards to "their solution".*

Six participants still indicated after the intervention that they had not had the opportunity to apply creativity in the workplace. They felt that this was an area that needed more focus and constant reminders to use the tools and dispositions in order to be creative when they had to solve problems, make decisions and design a new way of operating in the business.

4.4.4 Category four: Solving conflict in the workplace

Table 4.6: Solving conflict in the workplace

Pre-assessment (n=30)		Post-assessment (n=20)	
Sub-categories		**Sub-categories**	
i.	Analyse the problem	i.	Consider other people's views
ii.	Solution: goes with what feels right for the person	ii.	Manage conflict in a more focused and organised way
iii.	Generating options/solutions	iii.	Look beyond the obvious to solve conflict
		iv.	Identify consequences

The participants applied their thinking in analysing the problem that caused the conflict in the pre-assessment. They did generate solutions or options to manage the conflict but they also applied solutions that felt right for the person. They did not distance themselves from the problem to think effectively.

In the post-assessment, after the intervention, they focused on other people's views and did this in a more structured and organised way in contrast with what felt right for the person. Examples were:

Getting everyone's input to conflict has helped smooth over some difficult situations (primarily considering others' points of view as well).

The tools provided a structure and created an opportunity to review the issues objectively and hence removed the issues from the individual.

Will follow a process and leave out the emotions - helps you stick to the problem.

Once again the participants profiled the characteristics of people who think effectively as set out by Feuerstein et al. (1980); Sternberg

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(1984); Ennis (1985); Glatthorn and Baron (1985) and Perkins (1985):

- Persistence: People demonstrate growth in thinking abilities and skills by increasing their use of alternative strategies of problem solving. They collect evidence to indicate their problem solving strategy is working, and if one strategy is not working, they know how to back up and try another.
- Decreasing impulsivity: When it is important to do so, people with effective thinking skills think before they act.
- Listening to others with understanding and empathy: Being able to rephrase others' ideas, detecting indicators (cues) of their feelings or emotional states in their oral or body language (empathy).
- Cooperative thinking - social intelligence: Working in groups requires the ability to justify ideas and to test the feasibility of solution strategies on others.

4.4.5 Category five: Strategic planning

Table 4.7: Strategic planning

Pre-assessment (n=30)		Post-assessment (n=20)	
Sub-categories		**Sub-categories**	
i.	Generate options	i.	Come up with more solutions
ii.	Analyse the plan	ii.	Get input from larger group to influence decisions
iii.	Involve others in the planning	iii.	Use tools to do strategic planning
iv.	Identify end result	iv.	Use tools to plan for new initiatives
v.	Generate alternatives		
vi.	Take into account other factors		

In the pre-assessment the participants did identify the end result and generated options and alternatives. They also involved others in their planning and two participants indicated that they considered other factors when they planned strategically. The involvement of others was minimal. It was required of them as managers to think and plan strategically and therefore they had been skilled in the process.

The influence of the intervention was evident in the post-assessment as they became more aware of the positive influence of more people's involvement in strategic planning. They implemented the involvement of others with positive results. They created new ways of working and this brought about a new initiative in the business. Transformative learning took place as the participants - as adult learners - changed their meaning schemes (specific beliefs, attitudes, and emotional reactions) and engaged in critical reflection on their experiences, which in turn led to a perspective transformation (Mezirow, 1991:167). They involved a whole department to help create it. It took them longer as they spent more time on generating different options and alternatives and looked at the consequences and sequence of each of these options/alternatives. Once again they used the tools in the process. Creativity was experienced in the thinking process as they managed to look at old processes in a new way and changed the way in which they had operated for years.

Examples of their responses were:

Once again it (the thinking tools) assists with a larger input and different ideas used to strategise - use of C & S (Consequence and Sequence). The 'may we' or 'should we' is very helpful in seeking

direction.

Have used the tools to engage the whole department in a strategic planning session - not done in the past. Very successful.

Tools were used to plan a new strategic initiative - a new business was created. All were included in process; numerous options were discussed and explored. Best one was acted upon.

We have used the tools to plan a new way of working; to be more productive. It helped a lot to come up with a different way that was normally quite difficult in the past.

The intervention influenced the way they thought when they thought strategically and planned for the future strategically. They were aware of their thinking and of what they needed to improve their thinking: to think wider and to think beyond the obvious.

4.4.6 Category six: Day-to-day activities

Table 4.8: Day-to-day activities

Pre-assessment (n=30)	Post-assessment (n=20)	
Sub-categories	**Sub-categories**	
In pre-assessment day-to-day activities are only concerned with conflict handling	i.	Consider others' ideas
	ii.	Make decisions
	iii.	Remove emotions from decisions and conflict
	iv.	Solve problems

In the pre-assessment the participants indicated the use of thinking in

solving conflict on a day-to-day basis.

After the intervention, in the post-assessment, it was evident that the participants used their thinking more effectively when dealing with others as they considered their ideas, and when to make decisions and solve problems. The thinking tools helped them to manage conflict more effectively as well as to make decisions by removing the emotions from the conflict and the decision.

Their responses were:

I respect others' suggestions because I am well aware of the fact that they could have used other methods to arrive at an answer.

I use the tools when others' decisions influence my work environment."

When faced with difficult decisions I use the tools.

It is just that you approach things differently and don't make decisions without taking relevant and affecting factors into account.

I focus on obtaining the facts when I have to make a decision and not my emotions.

We use the tools often when we are faced with problems.

I look at the problem wider than what is in front of me, by asking input from others and I focus on the positive, negative and interesting.

A clear awareness of their thinking was evident in the participants'

thinking in their day-to-day activities. They used effective thinking skills to solve problems as they implemented a holistic approach to solving problems. "People with effective thinking skills start to ask questions and pose problems themselves when they deal with situations or problems" (Feuerstein et al., 1980; Sternberg, 1984; Ennis, 1985; Glatthorn & Baron, 1985; Perkins, 1985). Transformative learning occurred. This observation is supported by Mezirow's (1997:6) description that transformative learning occurs when individuals change their frames of reference by critically reflecting on their assumptions and beliefs and consciously making and implementing plans that bring about new ways of defining their worlds.

4.5 CONCLUSION

The influence of the intervention was clear in most areas identified in the pre- and post-assessments as well as in observations made in the day-to-day activities of the participants and in semi-structured interviews.

The participants were quite familiar with the concept of analysing and criticising as well as making judgements, as seen in the frequency of the units in identifying sub-categories in answering the open-ended questions on how they solve problems and make decisions.

Analytical and critical thinking has its place in solving problems, making decisions and even innovation, but what was seriously lacking and still is in some areas, was creative thinking, or looking at problems and design from different angles (Arlin, 1975).

After the intervention, the participants were aware of their thinking

and they operationalised effective thinking dispositions by taking time to solve problems, make decisions and plan strategically. They became more creative by looking beyond the obvious of a problem or solution and generated more alternatives and options when faced with challenges.

The influence of the intervention impacted on their day-to-day activities as managers as they started to challenge the status quo. However, they experienced frustration as the senior manager was not willing to give them scope to use their thinking skills, as he limited their time to think about problems or to implement new processes.

It was evident that not all the participants who had been exposed to the intervention used their thinking skills more effectively. Some participants experienced the changing environment negatively and resisted learning more effective thinking skills as they were content with their old ways of thinking. Some of the participants struggled to maintain the use of the tools as the daily routine took its toll and they fell back to the old ways of thinking. Continuous reminders concerning using the tools and a changing environment where innovation is prevalent will foster effective thinking skills. This situation does not prevail in this division at present.

The participants commented on the intervention as follows:

- *This is a wonderful and simple "method/tool" for young and old to use - it teaches you how to think without doubting yourself!*
- *It has been very enlightening and informative.*
- *Thinking about it now after six months I would say it would be*

good to brush up on the theory and to fill in the missing gaps. What did I keep and what did I drop?

- *I know if you apply the principles it does help, because I tried a few in the beginning.*

- *I think it is an excellent tool that should be used on a daily basis (and it can). In the beginning it seems like a lot of work, but once you got used to it, you don't even need paper to do it. It kind of comes naturally. I am thankful that the programme was introduced to me.*

- *I think it is a good programme and one just has to be disciplined to stick to using it and not slip back into the old style of thinking.*

- *These tools are great- I have not used all of the skills as yet but I can see benefits in using the skills.*

- *A very useful set of tools that can be used in many situations in the business.*

- *At the time of attending the programme, I found it very good and requested that all my staff attend it as well.*

The influence of the intervention changed the participants' view of their thinking and although not all of them became effective thinkers after six months, some characteristics of individuals with effective thinking skills were evident as seen in the discussion of the post-assessment findings.

Transformative learning took place as the participants as adult learners dealt with real-life problems and it changed their meaning schemes and the way in which they solved problems and made decisions. They involved others in their process of eliciting options for more effective answers to difficult problems and new initiatives.

The internal validity of the research proved to be consistent, as triangulation of findings in the literature and observations by the researcher as well as the findings and interpretations from the pre- and post-assessments indicated a change in the use of effective thinking skills by the participants exposed to the intervention. Member checks helped to prove internal validity as the semi-structured interviews with the participants helped the researcher to make adjustments to the programme to ensure transformative learning as the participants worked with real problems and applied their reflective thinking to solve them. The researcher's position was used as a strategy to ensure internal validity where assumptions, world-view and theoretical orientation of the researcher were clarified at the outset of the programme delivery with stakeholders.

The external validity of the research was evident in the findings of the post-assessment where member checks (psychologist [as human resources consultant] who operated in the business unit with the researcher as well as senior managers to whom the initial proposal was delivered) proved to support the finding that the programme could be implemented across disciplines, age groups, cultures and industries providing similar circumstances prevail in the environment it is implemented.

Strategies followed in this study to enhance reliability, were that the researcher explained assumptions and the theory behind the study in Chapter One. Triangulation was used in terms of using multiple methods of gathering data as well as the sources of data and, in order for an audit to take place, the researcher described in detail how data were collected, how categories were derived and how decisions were

less structured as the emphasis was on rapport, trust and participation as measurers of avoiding error and establishing validity (Mertens, 1998:13; Gough, 2000: 29; Mouton, 2001:25).

The intervention of teaching the participants (adults) more effective thinking skills proved to have influenced them positively by findings in the post-assessment and observations made in the work environment. The participants were more in control of the changing environment they had to face and operate in every day as they were aware that they needed to involve others in their thinking processes and that it was necessary to look beyond the obvious and to constantly seek more options and alternatives to solve difficult, complicated problems. They became more thoughtful in their thinking and it is thoughtful lived experience that gets one to expert performance (Dreyfus & Dreyfus, 1986). Experts read the context and then act accordingly (Benner, 1985). The following statement by Mezirow (1991:3) supports these assertions:

> In adulthood, rather than merely adapting to changing circumstances by more diligently applying old ways of knowing … [people] discover a need to acquire new perspectives in order to gain a more complete understanding of changing events and a higher degree of control over their lives.

CHAPTER FIVE

SYNTHESIS, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

5.2 SUMMARY OF THE RELATED LITERATURE

5.2.1 Discussion of the concept "change"

5.2.2 Discussion of the concept the adult learner

5.2.3 Discussion of the concept of thinking skills

5.3 FINDINGS

5.4 CONCLUSIONS

5.5 RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

5.1 INTRODUCTION

The purpose of this study was to determine whether an intervention, a thinking skills programme, would change/influence the thinking of middle managers in an environment that is exposed to change, as described in the literature review. The purpose was to change their thinking in order for them to become more effective thinkers in their daily operations of solving problems, making decisions, thinking strategically and managing relationships. The research was implemented in an organisation operating in the financial services industry as an international company.

This chapter consists of a summary of the literature reviewed relating to change, the adult learner and effective thinking; a summary of the findings in this study; the conclusions; and recommendations for

application and further research.

5.2 SUMMARY OF RELATED LITERATURE

The interrelatedness of the three concepts of the adult learner and effective thinking in a changing environment needed to be investigated to provide a rationale for this study. It is important to understand the influence of the three concepts on each other and therefore the focus was placed on these concepts in the literature review. A discussion of the three concepts, and their influence on each other, will follow.

5.2.1 Discussion of the concept "change"

More than anything else, today's business and political experts are talking about change (Beck & Cowan, 1996:71; Ghoshal & Bartlett, 1997:9; Kanter, 1995:1). The interest is justified. The period between the 1990s and the present has been characterised by intensified transition (Beck & Cowan, 1996:71).

The forces for change - globalisation and technology - will inevitably grow (Kanter, 2001:74-75). Environmental forces have compelled most companies not merely to adjust or to adapt as they had to in the past, but to confront the need for major transformational change (Ghoshal & Bartlett, 1997:9). In a global, high-tech world, organisations need to be more fluid, inclusive and responsive. They need to manage change and complex information flows, grasp new ideas quickly, and spread those ideas throughout the enterprise. What counts is not whether everybody uses e-mail, but whether people quickly absorb the impact of information and respond to information (Ghoshal & Bartlett, 1997:10; Kanter, 1995:2).

The social analyst, Toffler (1993:17) cautions that the old world map is obsolete - we are undergoing the deepest rearrangement of global power since the birth of the industrial civilisation.

Handy (1995:45) states that it is not that change is occurring more rapidly, but that it is discontinuous. Such change lacks continuity and follows no logical sequence. Christensen (2001:197) enforces this statement by focusing on the fact that the amount of information available to managers – as well as the amount of work and judgement required to sort the important from the less important - is increasing exponentially.

The problems that have come to people in the transition to the twenty-first century can only be resolved by solutions that they, themselves, create. The pattern repeats itself: new times demand new thinking. Only this time, the "new thinking" must be more than the next regular step on Emerson's staircase. It must be well beyond the mark (Beck & Cowan, 1996:27).

It is within this turbulent, discontinuous, changing environment that adult learners need to operate as managers, as leaders. Managers, or adult learners, need to think differently - the thinking of the past will not solve the problems caused by the demands of the changing environment.

St-Amour (2001:20) enforces the personal transition by saying that changing an organisation to meet the changing market conditions or strategic goals can be one of the most exhilarating aspects of doing business today, but it can also cause confusion, low morale, high

turnover and decreased productivity amongst employees.

All changing organisations struggle with people-related issues. Most attention is usually given to the organisation in terms of structure, processes, tools, measurements, policies and procedures. But for transition to be successful, people need to buy-in and be committed. Their individual interests, values and competencies must be effectively aligned with the organisation's vision, culture and capabilities (Christensen, 2001:204; St-Amour, 2001:21).

It is evident that for organisations to survive and excel in a changing environment, the people of the organisation need to go through a transition. The people are adult learners and therefore it is necessary to understand how the adult learner learns; how he/she learns to operate in different circumstances, in a different environment with different demands that require more effective thinking.

5.2.2 Discussion of the concept of the "adult learner"

Skilful adult educators have known for a long time that they cannot teach adults in the same way that children have traditionally been taught. Adults are almost always voluntary learners and they simply disappear from learning experiences that don't satisfy them (Knowles, 1970).

The adult learner can be regarded as an educated person who has the capacity to generate questions in any domain of knowledge (Mehrmohammadi, 2001). This is the prevalent view of the adult learner in this research as the target group in the research consists of educated managers in the organisational context.

To transfer knowledge to the educated adult learner, the form of learning must be utilisation of knowledge. An idea or information is useful or productive to the extent that it is put to use in solving problems (Whitehead, 1967; Russell, 1977).

Freire (Freire & Faundez, 1989) looks upon adult education primarily as a medium of social change. In this context he speaks of "pedagogy of asking questions" and promotes it as the method of social change.

Contradictions generated by rapid, dramatic change, and diversity in beliefs, values and social practices, are a hallmark of modern society. Adults in such a society face an urgent need to keep from being overwhelmed by change (Mezirow, 1991:2). Rather than merely adapting to changing circumstances by more diligently applying old ways of knowing, they discover a need to acquire new perspectives in order to gain a more complete understanding of changing events and higher degree of control over their lives (Mezirow, 1991:3).

Adult learning is the foundation of adult education. In this research the focus was on transformative learning as it enables the adult in a changing environment to use the knowledge acquired in reflective thinking processes to manage change and make insightful choices. Making meaning is central to what learning is all about. The learning process may be understood as the extension of our ability to make explicit, to schematise (make an association within a frame of reference), to appropriate (accept an interpretation as our own), to remember (recall an earlier interpretation), to validate (establish the truth, justification, appropriateness, or authenticity of what is asserted), and to act upon (decide, change an attitude towards,

modify a perspective on, or perform) some aspect of our engagement with the environment, other persons, or ourselves.

For learners to change their "meaning schemes" (specific beliefs, attitudes, and emotional reactions), they must engage in critical reflection on their experiences, which in turn leads to a perspective transformation (Mezirow, 1991:167).

Reflective learning is an important focus of adult learning. Reflective learning involves the process of reflection. Thinkers such as Freire (1972a, 1972b), Mezirow (1977, 1981), Argyris (1982), Kolb (1984) and Boud *et al*. (1985) have all examined the process of reflection. Reflective learning involves assessment or reassessment of assumptions. Reflective learning becomes transformative whenever assumptions or premises are found to be distorting, inauthentic, or otherwise invalid. Transformative learning results in new or transformed meaning schemes or, when reflection focuses on premises, transformed meaning perspectives.

A number of critical responses to Mezirow's theory of transformative learning have emerged over the years. A view of transformative learning as an intuitive, creative, emotional process is beginning to emerge in the literature (Grabov, 1997:89-96). This view of transformative learning is based primarily on the work of Boyd (Boyd & Myers, 1988), who has developed a theory of transformative education based on analytical (or depth) psychology. For Boyd, transformation is a fundamental change in one's personality involving (together) the resolution of a personal dilemma and the expansion of consciousness resulting in greater personality integration (Boyd, &

Myers, 1989:261-284).

It is true that transformative learning requires that learners address problems through critical reflection. What is clear is that transformative learning demands a different approach by the educator. Although adult learners must decide on their own to engage in transformative learning, educators who wish to promote transformative learning have the responsibility to set the stage and provide opportunities for critical reflection (Cranton, 1994).

Transformative learning requires different thinking and therefore it is doubtlessly appropriate to teach adults more effective thinking skills.

5.2.3 Discussion of the concept of "thinking skills"

Can thinking be taught? Many are sceptical about the idea, in some cases because they regard thinking as an activity that comes naturally, like walking or talking. Others reject the idea because they see thinking as dependent on intelligence; and believing this to be an innate quality, they doubt if teaching can have any lasting effect on it. This view of intelligence is increasingly challenged, and even those who hold the view may accept that, with appropriate training and experience, a person's potential can be realised more fully.

Thinking involves the appropriate use of knowledge, and it should not be assumed that this concept will develop spontaneously. Thinking is an imprecise term, which includes problem solving, decision-making, critical thinking, logical reasoning and creative thinking (Nickerson & Zodhiates, 1988:9). These are activities that go beyond knowledge acquisition and there is reason to believe that current educational

practice has not given adequate attention to these aspects of thinking.

According to De Bono (1991:33), thinking is: "… the deliberate exploration of experience for a purpose. That purpose may be understanding, decision-making, planning, problem solving, judgement and so on".

A theory of innate general intelligence dominated much of the educational practice of the first half of the twentieth century. The thinking was that the mind was largely inborn and relatively unchanging. This view is still widely held in popular thinking (OECD, 1990:203).

Developments in cognitive psychology since 1950, however, have led to a rather different interpretation of intelligence (Bruner, Goodnow & Austin, 1956; Bruner, 1960), linking reasoning to the structuring of experience, the development of schemata and the formation of concepts. Intelligence has also been closely linked to language acquisition (Chomsky, 1972; Vygotsky, 1978).

Cognitive psychology has developed these ideas (as noted by Inhelder and Piaget) extensively in recent years. New theories of intelligence have emerged, such as Gardner's "multiple intelligence" (Gardner, 1983) and Sternberg's (1984) "triarchic intelligence", while Flavell's (1976) "metacognition" is one of several new approaches to how thinking can be learned.

A thinking system - analysis, criticism, judgement and argument - provides a way of thinking where new experiences are fitted into the

existing boxes or matched with the principles derived from the past. This is perfectly adequate in a stable world where the future is the same as the past - but totally inadequate in a changing world where the old boxes do not apply. Instead of being based on judgement, the way forward needs to be designed.

The traditional thinking system is greatly lacking in constructive energy, creative energy and design energy. Description and analysis are not enough (De Bono, 1996:12).

A person with effective thinking skills will exhibit intelligent behaviour when confronted with problems and questions where the immediate answer is not known. Managers need to behave intelligently when confronted with challenging conditions that demand strategic reasoning, insightfulness, perseverance, creativity, and craftsmanship to resolve complex problems (Costa, 1985).

Human beings who behave intelligently and have effective thinking skills share identifiable characteristics (Feuerstein, Rand, Hoffman & Miller, 1980; Sternberg, 1984; Ennis, 1985; Glathorn & Baron, 1985; Perkins, 1985). These characteristics are (see Chapter Two):

- Persistence.
- Decreasing impulsivity.
- Listening to others with understanding and empathy.
- Cooperative thinking - social intelligence.
- Flexibility in thinking.
- Metacognition- awareness of one's own thinking.
- Striving for accuracy and precision.
- A sense of humour.

- Questioning and problem posing.
- Drawing on past knowledge and applying it to new situations.
- Risk taking.
- Using all senses.
- Ingenuity, originality, and insight: creativity.
- Wonderment, inquisitiveness, curiosity, and the enjoyment of problem solving - a sense of efficiency as a thinker.

A greater awareness developed in the later half of the twentieth century for new cognitive skills to manage the demands of a changing environment and to teach higher order thinking skills. Resnick (1987:7) emphasises this by saying:

It is a new challenge to develop educational programmes that assume that all individuals, not just elite, can become effective thinkers.

The extensive range of development produced a wide variety of methods in, and approaches to, the teaching of thinking. Those who adopt a "skills" approach, identify component skills in thinking, and practise these skills through exercises which are usually "content free" or not closely linked with any subject discipline. A contrasting view is held by those who argue for "infusion", on the grounds that the process of thinking is inseparable from the content.

To be effective in the teaching of thinking skills one must use a range of methods. Glaser (1984:101) concludes:

The pedagogical implication that follows from this is that an effective strategy for instruction involves a kind of interrogation

and confrontation. Expert teachers do this effectively, employing case methods approaches, discovery methods and various forms of Socratic inquiry dialogue … Such interactive inquiry methods are powerful tools for teaching thinking in the context of subject matter.

The role of the teacher/trainer is very important in the effective teaching of thinking skills. The role of the teacher/trainer must be one of a facilitator; as a mediator of experience (Rogers, 1969).

As important as the role of the facilitator to ensure effective transfer of thinking skills, is the recognition that attitudes and motivation play an important part in thinking. Resnick (1987:41) refers to this as:

The term disposition should not be taken to imply a biological or inherent trait. As used here, it is more akin to a habit of thought, one that can be learned, and therefore taught. Engaging in higher order thinking with others seems likely to teach students that they have the ability, the permission, and even the obligation to engage in a kind of critical analysis.

This aspect is also stressed by others who review the field (Paul in Baron & Sternberg, 1987:141-142; Nickerson & Zodhaites, 1988:25-27). Gardner (1989:45) suggests that high self-esteem and an internal locus of control are needed.

It would be easy to see dispositions mainly as an effort to honour the role of motivation in complex cognition, and clearly this is one of the objectives. However, Perkins *et al.* (1993:5) propose a conception of

dispositions that includes attention to habits, perceptual sensitivities, and even abilities. This conception puts forth dispositions as a unit of analysis for a broad and fruitful conception of mind.

De Bono's CoRT (Cognitive Research Trust) Thinking Lessons programme for teaching effective thinking skills is the most widely used in the world for the direct teaching of thinking skills (De Bono, 1988). The methodology is quite simple. It is based on "tools" and "awareness". The tools are practised on a wide range of situations. The big problem with teaching thinking skills is transfer (De Bono, 1988). With the tool method the skills are embedded in the tool. The process is neither inductive nor deductive, but "operative". The other element in the course is awareness. This refers to insight, realisation, and understanding of what goes on in thinking. "If we get to understand the 'landscape' of thinking it becomes easier to find your way around."

The dispositional view of teaching thinking skills with the CoRT thinking skills programme formed the basis of the cognitive intervention done in the organisation with middle managers.

It is change that forces the need for more effective thinking. The middle managers in an organisation need thinking skills to think more effectively to manage in a changing society. Rather than merely adapting to changing circumstances by simply diligently applying old ways of knowing, they discover a need to acquire new perspectives in order to gain a more complete understanding of changing events and a higher degree of control over their lives (Mezirow, 1997). The teaching of thinking skills will help the adult learners (managers) to

change their "meaning schemes" (specific beliefs, attitudes, and emotional reactions) and they will engage in critical reflection on their experiences, which in turn leads to a perspective transformation (Mezirow, 1991).

5.3 FINDINGS

The findings of the research study are discussed to place it within the context of the hypothesis and the research methodology.

The research in this study took place in four phases. The first and last phases will be discussed, the first phase being the pre-assessment and the last (fourth) phase the post-assessment. The design was used to establish whether the participants had improved while being served by the programme (intervention). The assessment was done in a qualitative manner. The qualitative methods included open-ended questionnaires, semi-structured interviews and observation in the workplace. The findings were analysed with content analysis and the capturing of the frequency of statements of the participants identified the sub-categories. The findings were presented in tables and figures. The findings will be discussed based on these two phases.

5.3.1 Pre-assessment

The information in the pre-assessment was gathered from participants (n=30) that participated in the intervention. The categories identified through the open-ended questionnaire were:

- Problem solving.
- Decision-making.
- Managing day-to-day (conflict handling).
- Applying creative thinking in the workplace.

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- Strategic thinking.

The sub-categories per category were derived from the open-ended questions through content analysis (see p.108). The recurring responses were noted and categorised (Addendum D). The most frequent responses were clustered together to form a sub-category.

The findings were as follows:

Table 5.1: Findings from pre-assessment questionnaire

Category	Sub-category
Problem solving	• Identify the problem • Analyse the problem • Discuss the problem • Look at options and solutions • No analysis of the problem • Come up with one solution to solve problem • Implementation plan to solve problem
Decision-making	• Analyse the problem • Look at consequences of decision • Implement one solution • Weigh up alternatives • Consider all factors • Generate more than one solution/option • Take other people's views in account
Managing day-to-day (conflict handling)	• Identify the problem that caused conflict • Analyse the problem • Solution: goes with what feels right for person • Generate options/solutions to the conflict
Apply creative thinking in the workplace	• Not creative in the workplace • Weigh up alternatives • Use previous experience •

Table 5.1: Findings from pre-assessment questionnaire continues...

Category	Sub-category
Strategic thinking	• Generate options • Analyse the plan • Involve others in the planning • Identify end result • Generate alternatives • Take into account other factors

The responses indicated a strong emphasis on **analysing** the problem to solve it, or to make a decision, or to manage conflict. They did focus on involving other people in solving problems or making decisions, but in an advisory capacity. Most of the participants indicated that they didn't apply creative thinking in the workplace as there were no opportunities to apply it in their function as managers. They were evidently not aware of their thinking processes as there was not significant emphasis on generating options or alternatives when faced with a problem, or in the decision-making process. The sub-categories in strategic thinking indicated a lack of consideration of all factors that will influence the process and no indication of looking at the consequences and sequences specifically, although they did focus on the end result but with no long-term focus.

The awareness of thinking about their thinking did not surface clearly in the responses.

The semi-structured interviews with the participants in the workplace after the pre-assessment and during the intervention supported the findings in the pre-assessment. This interview process formed a critical part of dynamic assessment where information gathering on the process of teaching thinking is important to assess whether transfer of learning has taken place and what needs to be changed or added to

the programme to ensure greater transfer of learning. After the first two deliveries of the programme, the participants randomly interviewed indicated they had become aware of their thinking for the first time, but that it was difficult to apply the thinking tools as they hadn't internalised the use of the thinking tools and thinking dispositions yet and had gone back to their old ways of thinking. Resistance was noted with two or three of the participants as they indicated that they didn't have time to use the tools and they were confident in their old way of solving problems. They were, however, aware of their thinking and realised they had the ability to change their thinking although it was hard to break the old patterns of thinking.

The observations made in the workplace by the researcher in the capacity of human resources consultant, indicated that the participants in strategic planning sessions still needed to be prompted to use the thinking skills as they didn't come naturally.

The semi-structured interviews and observations resulted in changing the programme to address those specific issues in the workplace to ensure more effective transfer of teaching the thinking skills and dispositions. More emphasis was placed on the dispositions as it would result in using the thinking skills more naturally.

5.3.2 Post-Assessment

The information gathered in the post-assessment was from participants (n=20) that participated in the intervention. The post-assessment was conducted six months after the last session was delivered. Feedback was given by twenty (20) of the initial thirty (30)

participants that took part in the intervention. The reason for this was that five of the participants had moved to another part of the business, while three had resigned owing to the restructuring process. Two participants did not give feedback in the assessment and their feedback was obtained by means of a structured interview using the same questions as in the post-assessment questionnaire.

The categories and sub-categories were identified in the same way as in the pre-assessment. Owing to a development in the intervention, the category "Day-to-day activities" became a category on its own. The participants indicated that they needed more effective thinking skills in their day-to-day activities as this was a major part of their activities as managers.

The findings were as follows:

Table 5.2: Findings from post assessment questionnaire

Categories	Sub-categories
Problem solving	• Come up with more than one idea. • Other factors were taken into consideration-solve problems more effectively. • Take time to think-reflect on their thinking. • Look at the bigger picture. • Used other people's views. • Used the tools to solve problems. • Think creatively in solving problems.
Decision-making	• Probe for possible solutions – using the tools. • Draw in other people's views. • Consider all factors. • Look for more than one solution. • Focus on the consequences. • See the bigger picture.

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Table 5.2: Findings from post assessment questionnaire continues...

Categories	Sub-categories
Creativity (in the work place)	• Find effective solutions. • Link different ideas. • Look beyond the obvious. • Gather a lot of detail. • Create alternatives/possible solutions. • Don't use creativity in the workplace.
Solving conflict in the workplace	• Consider other people's views. • Manage conflict in a more focused and organised way. • Look beyond the obvious to solve conflict. • Identify consequences.
Strategic planning	• Come up with more solutions. • Obtain input from larger group to influence decisions. • Use tools to do strategic planning. • Use tools to plan for new initiatives.
Day-to-day activities	• Consider others' ideas • Make decisions. • Remove emotions from decisions and conflict. • Solve problems.

The findings in the post-assessment proved that there had been development in how the managers used their thinking skills, and there had been a noticeable development in their awareness of their thinking. In the pre-assessment the focus was on analysing the problem whereas in the post-assessment the focus was on generating more alternatives and options as well as on considering all the factors when they had to solve a problem or make a decision. They were aware of their thinking as they used the tools to help them solve problems, think strategically, make decisions and manage conflict.

They used the tool OPV (Other People's Views) considerably more in managing conflict and focusing on the issue or person rather on their

own emotions.

Creativity in the workplace improved. At the same time they showed an awareness of being creative and they had the tools to help them to accomplish it. They managed to link different ideas in order to create a new solution. Creativity needed to be further developed, as some of the participants still indicated that they did not use it in the workplace.

The most significant development in using their thinking to be more effective thinkers was in their strategic thinking, where it resulted in their implementing a new initiative in the business. They used the thinking dispositions and the thinking tools to create the new initiative.

The category "Day-to-day activities" indicated that they had internalised the thinking tools in their daily activities, especially in managing conflict, making decisions and applying thinking beyond the obvious in the workplace. The use of their effective thinking broadened and once again this was a significant development in their awareness of their thinking.

Feuerstein et al. (1980); Sternberg (1984); Ennis (1985); Glatthorn & Baron (1985); and Perkins (1985) state that human beings who behave intelligently and have effective thinking skills share identifiable characteristics. Some of these characteristics are listening to others with understanding and empathy, showing accuracy in expressing other people's concepts, emotions and problems - all are indicators of listening behaviours. These characteristics as well as others (see Chapter Two) became evident in the emerging sub-categories of the post-assessment.

The post-assessment indicated a clear development in the managers' awareness of their thinking and in their applying more effective thinking skills in their managerial activities. They were more aware of thinking creatively in solving problems and making decisions, but they still needed to apply creative thinking more effectively in the workplace.

5.4 CONCLUSIONS

From the above findings the following closing conclusions can be made:

- Managers as adult learners in a changing environment need more effective thinking skills to solve problems, make decisions, manage conflict in the workplace, plan strategically and think creatively. (Aims of study achieved.)

- The participants, managers, reacted mostly positively to the focused thinking skills training programme as they became aware of their thinking and realised that they solved problems more effectively when they applied the thinking dispositions and thinking tools. They became more confident in their thinking (Aims of study achieved). (See findings p. 186)

- To allow for changes in the dynamic intervention, brought about by the needs and development of the participants during their learning process, the intervention should run over a period of at least six months. (See Chapter Four, pp. 117 and 148.)

- The programme addresses real problems and it resulted successfully in the dynamic assessment process of cognitive development in adult learners. The use of actual problems and challenges in the workplace (action learning) fostered transformative learning in the participants. (See Chapter Four,

pp.145 and 171.)

- The facilitator (researcher) had to operate in the domain of transformative learning to help the participants examine their beliefs. (See Chapter Four, p. 146.)

- For effective facilitation of the programme, adult learning and the principles thereof need to form its basis. After applying the principles of transformative learning, the researcher concluded that to be an effective facilitator the following attributes were needed: to be knowledgeable; to show concern for subject learning; to present material clearly; to motivate; to emphasise relevance of material and to be enthusiastic. (See Chapter Two, p.77.)

- For effective teaching of thinking skills in a work environment exposed to turbulent change, the changes in the environment, such as the fear of restructuring and more demands on managers to manage more work with fewer staff needed to be acknowledged. This was noted in the resistance of some of the participants as they were in a personal change process and fear restricted their internalisation of the learning process. This impacted on the effective implementation of the programme. (See Chapter Four, p. 143.)

- Teaching the participants to use only the thinking tools would not have achieved the same level of success in their becoming effective thinkers. The combination of teaching thinking dispositions and the application thereof with the help of the thinking tools is the most effective approach. This proved to be a strength of the programme. (Aim of study achieved. See Chapter Four, pp. 156, 164, 180,194.)

- A staff satisfaction questionnaire administered in the business

unit and not by the researcher, to all staff within the same business unit, proved that the division in which the participants operated had had a more productive period than the others. (Aim of study. See Chapter Four, p.156.)

- The implementation of the programme was adjusted to accommodate changes and needs noted from the semi-structured interviews and observations made in the workplace by the researcher.

- A noticeable outcome of the intervention was emancipatory learning. During the intervention the participants were freed from forces that limited their thinking within the current organisational paradigm. They explored the freedom of thinking beyond the obvious and solved seemingly insoluble problems (managerial). Emancipatory learning results in transformation of learner perspectives through critical reflections (Mezirow, 1991). (See Chapter Four, p. 195.)

- Strengths of the programme were that the facilitator used adult learning principles and operated within the business environment to understand cultural forces and real work problems.

- A weakness of the programme was that another follow-up after the six months was not conducted. The researcher was not operating in the environment as a human resources consultant after the post- assessment was conducted.

5.5 RECOMMENDATIONS AND SUGGESTIONS FOR APPLICATION AND FURTHER RESEARCH

The following are recommendations and suggestions for application and further research:

- In the research study a small number of middle managers were trained in effective thinking skills. It is recommended that all middle managers in an organisation be trained to become effective thinkers.

- The implementation of the thinking dispositions and thinking tools was dependent on the facilitator's prompting for use of the dispositions and tools. It is recommended that effective thinking agents be trained to fulfil the role of facilitator. These thinking agents need to be managers in the organisation.

- It is recommended that a formal programme on teaching effective thinking skills for all managers in the organisation be part of their development plan or learning path. This will help managers to grow as leaders in the organisation, to manage change more effectively and design a future for the organisation, which will ensure that it will excel in the global economy.

- The role of the facilitator both in presenting and facilitating the programme and in implementing it after the delivery was noted as a key factor for the transfer of thinking skills. The facilitator (researcher) played an active role in fostering critical reflection by challenging participants to consider why they held certain assumptions, values and beliefs (Cranton, 1994). Further research can be done to determine criteria and characteristics of as well as academic requirements for the facilitator of a thinking skills programme.

- Further research can be undertaken to assess whether participants that were taught effective thinking skills

became effective role models for creating change in an organisational environment.

- Thinking styles and the impact thereof on teaching thinking effectively need to be researched more thoroughly.

- With the South African setting in mind, it is recommended that a thinking skills programme be repeated to involve greater diversity in terms of culture and race. The object would be to determine: (a) whether participants experience the same obstacles in transferring the thinking skills and (b) the influence of the environment in which they operate.

- A similar study, where employees of a higher status within the company serve as participants for assessment, may have relevance.

The teaching of effective thinking skills will become more and more important in the organisational environment as the 21st century will make greater demands on managers to manage change more effectively. It will enhance the lives of those individuals, for as they become more effective thinkers, they will also use their skills in their communities and their personal lives. The benefits will not only be evident on an organisational level, but will have a systemic influence, both on the person and on the community, thus enhancing the socio-economic environment of South Africa.

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ADDENDUM A

EXAMPLE OF PRE-ASSESSMENT QUESTIONNAIRE

ADDENDUM A

PRE-ASSESSMENT QUESTIONNAIRE ON THINKING SKILLS

Thank you for making time to answer this questionnaire.

Please answer the questions honestly and openly.

The questionnaire is anonymous and all information will be handled with confidentiality.

The information will not be shared with your superiors or subordinates.

Please provide the following information on yourself:

Grade: _____

Job title: _____

Question 1

Please explain in detail how you solve problems in the workplace/business unit:

_____

_____

_____

Question 2

Explain the process you follow when you have to make a decision in the workplace/business environment:

_____

_____

_____

Question 3

When you are faced with the design of new processes or need to implement new concepts/tools/strategies/systems in the business environment, explain the process you would follow to accomplish it:

_____

_____

_____

Question 4

How would you go about solving conflict in the business environment?

_____

_____

_____

Question 5

Please explain the process in how you execute strategic planning in the work place/business environment. Please motivate your answer.

_____

_____

_____

Question 6

Do you think it is important for managers in the business environment to improve their thinking skills? Please motivate your answer.

_____

_____

_____

Thank you for your contribution.

Please send the completed questionnaire back to Christine Hermanson.

Christine Hermanson

Designer and Facilitator

7 February 02

ADDENDUM B

EXAMPLE OF POST ASSESSMENT QUESTIONNARE

POST-ASSESSMENT QUESTIONNAIRE ON THINKING SKILLS PROGRAMME

Thank you for making time to answer this questionnaire.

The questions are based on the Thinking Skills Programme you have attended.

Please answer the questions honestly and openly.

The questionnaire is anonymous and all information will be handled with confidentiality.

The information will not be shared with your superiors or subordinates.

Please provide the following information on yourself:

Grade: _____

Job title: _____

Question 1

Did the Thinking Skills Programme influence you on how you operate within your business environment? Please motivate you answer.

Question 2

How did the thinking tools influence the way you:

Solve problems in the business environment

Make decisions in the business environment

----

c. When you have to be creative and design new processes or need to implement new concepts/tools/strategies/systems? (in the business environment)

----

d. Solve conflict in the business environment

Question 3

Since you have been exposed to the Thinking Skills Programme, has it influenced you on how you do strategic planning? Please motivate your answer.

Question 4

Do you manage your day-to-day activities in the business environment differently since you have been exposed to the Thinking Skills Programme? Please motivate your answer.

Question 5

You were introduced to a set of thinking tools in the Thinking Skills Programme. Do you use them in the different relationships you have at work? Please explain how you use it - if you use it.

Question 6

Do you have any comments that you want to express on the Thinking Skills Programme? Please write them down.

Thank you for contribution.

Please send the completed questionnaire back to Christine Hermanson.

Christine Hermanson

Programme Designer and Facilitator

7 August 02

ADDENDUM C
THINKING STYLES QUESTIONNAIRE

THINKING STYLES QUESTIONNAIRE

Sternberg-Wagner Self-Assessment Inventory

THE LEGISLATIVE STYLE

Before reading on, start with Self-assessment 2.1 Then score yourself using the scoring system given at the end of the test.

Self-assessment 2.1 Sternberg-Wagner Self-Assessment Inventory on the Legislative Style

Read each of the following statements and then rate yourself on a 1-7 scale, where each rating corresponds to how well a statement describes you.

1 = Not at all well
2 = Not very well
3 = Slightly well
4 = Somewhat well
6 = Very well
7 = Extremely well

1.   When making decisions, I tend to rely on my own ideas and ways of doing things
2.   When faced with a problem, I use my own ideas and strategies to solve it.
3.   I like to play with my ideas and see how far they go.
4.   I like problems where I can try my own way of solving them.
5.   When working on a task, I like to start with my own ideas.
6.   Before starting a task, I like to figure out for myself how I will do my work.
7.   I feel happier about a job when I can decide for myself what and how to do it.
8.   I like situations where I can use my own ideas and ways of doing things.

Interpreting Scores

The way you evaluate your score is to add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. You now should have a number between 1.0 and 7.0. There are six categories of scores, which depend on your status and your sex. These six categories are shown below.

		Nonstudent Adults	
	Category	Male	Female
Very High	(Top 1% - 10%)	6.6 – 7.0	6.5 – 7.0
High	(Top 11% - 25%)	6.1 – 6.5	6.2 – 6.4
High Middle	(Top 26% - 50%)	5.5 – 6.0	5.2 – 6.1
Low Middle	(Top 51% - 75%)	4.9 – 5.4	4.5 – 5.1
Low	(Top 76% - 90%)	4.3 – 4.8	3.6 – 4.4
Very Low	(Top 91% - 100%)	1.0 – 4.2	1.0 – 3.5

If you scored in the "very high" category, then you have all or almost all of the characteristics of a legislative person. If you scored in the "high" category, you have many of these characteristics and if you scored in the "high middle" category, then you have at least some of the characteristics. If you scored in the bottom three categories, then this is not one of your preferred.

		Nonstudent Adults	
	Category	Male	Female
Very High	(Top 1% - 10%)	5.5 – 7.0	5.1 – 7.0
High	(Top 11% - 25%)	5.0 – 5.4	4.9 – 5.0
High Middle	(Top 26% - 50%)	4.2 – 4.9	4.2 – 4.8
Low Middle	(Top 51% - 75%)	3.6 – 4.1	3.7 – 4.1
Low	(Top 76% - 90%)	3.1 – 3.5	3.4 – 3.6
Very Low	(Top 91% - 100%)	1.0 – 3.0	4.0 – 3.0

If you scored in the "very high" category, then you have all or almost all of the characteristics of an executive person. If you scored in the "high" category, you have many of these characteristics.

THE JUDICIAL STYLE

Before reading on, start with the Self-assessment 2.3 Then score yourself using the scoring system at the end of the test.

Self-assessment 2.3 Sternberg-Wagner Self-Assessment Inventory on the Judicial Style.

Read each of the following statements, and then rate yourself on a 1 – 7 scale, where each rating corresponds to how well a statement describes you.

1 = Not at all well
2 = Not very well
3 = Slightly well
4 = Somewhat well
6 = Very well
7 = Extremely well

1.   When discussing or writing down ideas, I like criticizing others ways of doing things.
2.   When faced with opposing ideas, I like to decide which is the right way to do something.
3.   I like to check and rate opposing points of view or conflicting ideas.
4.   I like projects where I can study and rate different views and ideas.
5.   I prefer tasks or problems where I can grade the design or methods or others.
6.   When making a decision, I like to compare the opposing points of view.
7.   I like situations where I can compare and rate different ways of doing things.
8.   I enjoy work that involves analyzing, grading or comparing things.

THE MONARCHIC STYLE

Before reading on, you may wish to test and evaluate yourself on a scale measuring the monarchic style. If so, take Self-assessment 3.1.

Self-assessment 3.1 Sternberg-Wagner Self-Assessment Inventory on the Monarchic Style.

Read each of the following statements and then rate yourself on a 1 – 7 scale, where each rating corresponds to how well a statement describes you.

1 = Not at all well
2 = Not very well
3 = Slightly well
4 = Somewhat well
6 = Very well
7 = Extremely well

1.   When talking or writing about ideas, I stick to one main idea.
2.   I like to deal with major issues or themes, rather than details or facts.
3.   When trying to finish a task, I tend to ignore problems that come up.
4.   I use any means to reach my goal.
5.   When trying to make a decision, I tend to see only one major factor.

6. If there are several important things to do, I do the one most important to me.
7. I like to concentrate on one task at a time.
8. I have to finish one project before starting another one.

Interpreting Scores

The way you evaluate your score is to add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. You now should have a number between 1.0 and 7.0. There are six categories of scores, which depend on your status and your sex. These six categories are shown below.

THE EXECUTIVE STYLE

Before reading about the executive style, be sure to take Self-assessment 2.2. Then score yourself using the normative data that follow the quiz.

Self-assessment 2.2 Sternberg-Wagner Self-Assessment Inventory on the Executive Style

Read each of the following statements, and then rate yourself on a 1 – 7 scale, where each rating corresponds to how well a statement describes you.

1 = Not at all well
2 = Not very well
3 = Slightly well
4 = Somewhat well
6 = Very well
7 = Extremely well

1. When discussing or writing down ideas, I follow formal rules of presentation.
2. I am careful to use the proper method to solve any problem.
3. I like projects that have a clear structure and a set plan and goal.
4. Before starting a task or project, I check to see what method or procedure should be used.
5. I like situations in which my role or the way I participate is clearly defined.
6. I like to figure out how to solve a problem following certain rules.
7. I enjoy working on things that I can do by following directions.
8. I like to follow definite rules or directions when solving a problem or doing a task.

Interpreting Scores

The way you evaluate your score is to add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. You now should have a number between 1.0 and 7.0. There are six categories of scores, which depend on your status and your sex. These six categories are shown below.

		Nonstudent Adults	
	Category	Male	Female
Very High	(Top 1% - 10%)	5.6 – 7.0	5.8 – 7.0
High	(Top 11% - 25%)	5.3 – 5.5	5.2 – 5.7
High Middle	(Top 26% - 50%)	4.6 – 5.2	4.8 – 5.1
Low Middle	(Top 51% - 75%)	4.1 – 4.5	4.1 – 4.7
Low	(Top 76% - 90%)	3.6 – 4.0	3.4 – 4.0
Very Low	(Top 91% - 100%)	1.0 – 3.5	4.0 – 3.3

		College Student Adults	
	Category	Male	Female
Very High	(Top 1% - 10%)	5.3 – 7.0	5.6 – 7.0
High	(Top 11% - 25%)	4.6 – 5.2	5.0 – 5.5
High Middle	(Top 26% - 50%)	4.2 – 4.5	4.6 – 4.9
Low Middle	(Top 51% - 75%)	3.9 – 4.1	4.2 – 4.5
Low	(Top 76% - 90%)	3.5 – 3.8	3.4 – 4.1
Very Low	(Top 91% - 100%)	4.0 – 3.4	1.0 – 3.1

If you scored in the "very high" category, then you have all or almost all of the characteristics of a judicial person. If you scored in the "high" category, you have many of these characteristics, and if you scored in the "high middle" category, then you have at least some of the characteristics. If you scored in the bottom three categories, however, then this is not one of your preferred styles. Keep in mind, though, that just how judicial you are may vary across tasks, situations, and your time of life.

		Nonstudent Adults	
	Category	Male	Female
Very High	(Top 1% - 10%)	5.2 – 7.0	5.0 – 7.0
High	(Top 11% - 25%)	4.6 – 5.1	4.4 – 4.9
High Middle	(Top 26% - 50%)	4.4 – 4.5	3.8 – 4.0
Low Middle	(Top 51% - 75%)	3.4 – 4.0	3.2 – 3.7
Low	(Top 76% - 90%)	3.1 – 3.3	2.6 – 3.1
Very Low	(Top 91% - 100%)	4.0 – 3.0	4.0 – 2.5

	College Student Adults		
	Category	Male	Female
Very High	(Top 1% - 10%)	5.2 – 7.0	5.0 – 7.0
High	(Top 11% - 25%)	4.6 – 5.1	4.4 – 4.9
High Middle	(Top 26% - 50%)	4.4 – 4.5	3.8 – 4.0
Low Middle	(Top 51% - 75%)	3.4 – 4.0	3.2 – 3.7
Low	(Top 76% - 90%)	3.1 – 3.3	2.6 – 3.1
Very Low	(Top 91% - 100%)	4.0 – 3.0	4.0 – 2.5

If you scored in the "very high" category, then you have all or almost all of the characteristics of a monarchic person. If you scored in the "high" category you have many of these characteristics and if you scored in the "high middle" category, then you have at least some of the characteristics. If you scored in the bottom three categories, then this is not one of your preferred styles. Keep in mind, though, that just how monarchic you are may vary across tasks, situations, and your time of life.

	Nonstudent Adults		
	Category	Male	Female
Very High	(Top 1% - 10%)	5.2 – 7.0	5.0 – 7.0
High	(Top 11% - 25%)	4.6 – 5.1	4.4 – 4.9
High Middle	(Top 26% - 50%)	4.4 – 4.5	3.8 – 4.0
Low Middle	(Top 51% - 75%)	3.4 – 4.0	3.2 – 3.7
Low	(Top 76% - 90%)	3.1 – 3.3	2.6 – 3.1
Very Low	(Top 91% - 100%)	4.0 – 3.0	4.0 – 2.5

If you scored in the "very high" category, then you have all or almost all of the characteristics of a hierarchic person. If you scored in the "high" category, you have many of these characteristics, and if you scored in the "high middle" category, then you have at least some of the characteristics. If you scored in the bottom three categories, then this is not one of your preferred styles. Keep in mind, though, that just how hierarchic you are may vary across tasks, situations, and your time of life.

THE OLIGARCHIC STYLE

Test yourself on the oligarchic style (Self-assessment 3.3) before reading on.

Self-assessment 3.3 Sternberg Wagner Self-Assessment Inventory on the Oligarchic style

Read each of the following statements and then rate yourself on a 1 – 7 scale, where each rating corresponds to how well a statement describes you.

1 = Not at all well
2 = Not very well
3 = Slightly well
4 = Somewhat well
6 = Very well
7 = Extremely well

1. When I undertake some tasks, I am usually equally open to starting by working on any of several things.
2. When there are competing issues of importance to address in my work, I somehow try to address them simultaneously
3. Usually when I have many things to do, I split my time and attention equally among them
4. I try to have several things going on at once, so that I can shift back and forth between them.
5. Usually I do several things at once.
6. I sometimes have trouble setting priorities for multiple things that I need to get done.
7. I usually know what things need to be done, but I sometimes have trouble deciding in what order to do them.
8. Usually when working on a project I tend to view almost all aspects of it as equally important.

THE HIERARCHIC STYLE

Test yourself on the hierarchic style (Self-assessment 3.2) before reading on.

Self-assessment 3.2 Sternberg-Wagner Self-Assessment Inventory on the Hierarchic Style

Read each of the following statements and then rate yourself on a 1 – 7 scale, where each rating corresponds to how well a statement describes you.

1 = Not at all well
2 = Not very well
3 = Slightly well
4 = Somewhat well
6 = Very well
7 = Extremely well

1. I like to set priorities for the things I need to do before I start doing them.
2. In talking or writing down ideas, I like to have the issues organized in order of importance.
3. Before starting a project, I like to know the things I have to do and in what order.
4. In dealing with difficulties, I have a good sense of how important each of them is and what order to tackle them in.
5. When there are many things to do, I have a clear sense of the order in which to do them.
6. When starting something, I like to make a list of things to do and to order the things by importance.
7. When working on a task, I can see how the parts relate to the overall goal of the task.
8. When working on a task, I can see how the parts relate to the overall goal of the task.

Interpreting Scores

The way you evaluate your score is to add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. You now should have a number between 1.0 and 7.0. There are six categories of scores, which depend on your status and your sex. These six categories are shown below.

LEVELS, SCOPE, AND LEANING OF THINKING STYLES

The Global, Local, Internal, External, Liberal and Conservative Styles

Thinking styles can differ in level, scope and leaning. Let's see what each of these means.

LEVELS OF THINKING STYLES: GLOBAL AND LOCAL STYLES

Before reading about the global and local styles, take Self-Assessments 4.1 and 4.2 and then score them.

Self assessment 4.1 Sternberg-Wagner Self-Assessment Inventory on the Global Style

Read each of the following statements, and then rate yourself on a 1-7 scale, where each rating corresponds to how well a statement describes you.

1 = Not at all well
2 = Not very well
3 = Slightly well
4 = Somewhat well

6 = Very well
7 = Extremely well

1. I like situations or tasks in which I am not concerned with details.
2. I care more about the general effect than about the details of a task I have to do.
3. In doing a task, I like to see how what I do fits into the general picture.
4. I tend to emphasize the general aspect of issues or the overall effect of a project.
5. I like situations where I can focus on general issues, rather than on specifics.
6. In talking or writing down ideas, I like to show the scope and context of my idea, that is, the general picture.
7. I tend to pay little attention to details.
8. I like working on project that deal with general issues and not with nitty-gritty details.

Interpreting Scores

The way you evaluate your score is to add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. You now should have a number between 1.0 and 7.0. There are six categories of scores, which depend on your status and your sex. These six categories are shown below.

		Nonstudent Adults	
	Category	Male	Female
Very High	(Top 1% - 10%)	5.5 – 7.0	5.2 – 7.0
High	(Top 11% - 25%)	4.9 – 5.4	4.8 – 5.1
High Middle	(Top 26% - 50%)	4.4 – 4.8	4.0 – 4.7
Low Middle	(Top 51% - 75%)	3.6 – 4.3	3.5 – 3.9
Low	(Top 76% - 90%)	3.2 – 3.5	3.1 – 3.4
Very Low	(Top 91% - 100%)	1.0 – 3.1	1.0 – 3.0

		College Student Adults	
	Category	Male	Female
Very High	(Top 1% - 10%)	5.3 – 7.0	5.5 – 7.0
High	(Top 11% - 25%)	4.5 – 5.2	4.8 – 5.4
High Middle	(Top 26% - 50%)	4.0 – 4.4	4.1 – 4.7
Low Middle	(Top 51% - 75%)	3.5– 3.9	3.6 – 4.0
Low	(Top 76% - 90%)	3.1 – 3.4	2.9 – 3.5
Very Low	(Top 91% - 100%)	1.0 – 3.0	1.0 – 2.8

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If you scored in the "very high" category, then you have all or almost all of the characteristics of the global person. If you scored in the high category, you have many of these characteristics and if you scored in the "high middle" category, then you has at least some of the characteristics. If you scored in the bottom three categories, then this is not one of your preferred styles. Keep in mind, though, that just how global you are may carry across tasks situations and your time of life.

Self assessment 4.2 Sternberg-Wagner Self-Assessment Inventory on the Local Style

Read each of the following statements and then rate yourself on a 1 – 7 scale where each rating corresponds to how well a statement describes you.

1 = Not at all well
2 = Not very well
3 = Slightly well
4 = Somewhat well
6 = Very well
7 = Extremely well

1. I prefer to deal with specific problems rather than with general questions.
2. I prefer tasks dealing with a single, concrete problem, rather than general or multiple ones.
3. I tend to break down a problem into many smaller ones that I can solve, without looking at the problem as a whole.
4. I like to collect detailed or specific information for project I work on.
5. I like problems where I need to pay attention to detail.
6. I pay more attention to the parts of a task than to its overall effect or significance.
7. In discussing or writing on a topic, I think the details and facts are more important than the overall picture.
8. I like to memorize facts and bits of information without any particular content.

Interpreting Scores

The way you evaluate your score is to add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. You now should have a number between 1.0 and 7.0. There are six categories of scores, which depend on your status and your sex. These six categories are shown below.

	Category	Male	Female
Very High	(Top 1% - 10%)	5.1 – 7.0	5.1 – 7.0
High	(Top 11% - 25%)	4.4 – 5.0	4.4 – 5.0
High Middle	(Top 26% - 50%)	3.9 – 4.3	3.8 – 4.3
Low Middle	(Top 51% - 75%)	3.6 – 3.8	3.4 – 3.7
Low	(Top 76% - 90%)	3.4 – 3.5	3.0 – 3.3
Very Low	(Top 91% - 100%)	1.0 – 3.3	1.0 – 2.9

	College Student Adults		
	Category	Male	Female
Very High	(Top 1% - 10%)	4.9 – 7.0	4.5 – 7.0
High	(Top 11% - 25%)	4.4 – 4.8	4.3 – 4.4
High Middle	(Top 26% - 50%)	3.8 – 4.3	4.0 – 4.2
Low Middle	(Top 51% - 75%)	3.2 – 3.7	3.5 – 3.9
Low	(Top 76% - 90%)	2.8 – 3.1	2.9 – 3.4
Very Low	(Top 91% - 100%)	1.0 – 2.7	1.0 – 2.8

SCOPE OF THINKING STYLES: INTERNAL AND EXTERNAL STYLES

Before reading about the internal and external styles, take self-assessments 4.3 and 4.4 and then score yourself.

Self-assessment 4.3 Sternberg-Wagner Self-Assessment Inventory on the Internal Style.

Read each of the following statements, and then rate yourself on a 1 – 7 scale, where each rating corresponds to how well a statement describes you.

1 = Not at all well
2 = Not very well
3 = Slightly well
4 = Somewhat well
6 = Very well
7 = Extremely well

1. I like to control all phases of a project, without having to consult others.
2. When trying to make a decision, I rely on my own judgement of the situation.
3. I prefer situations where I can carry out my own ideas without relying on others.
4. When discussing or writing down ideas, I only like to use my own ideas.
5. I like projects that I can complete independently.

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6. I prefer to read reports for information I need, rather than ask others for it.
7. When faced with a problem, I like to work it out by myself.
8. I like to work alone on a task or problem.

Interpreting Scores

The way you evaluate your score is to add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. You now should have a number between 1.0 and 7.0. There are six categories of scores, which depend on your status and your sex. These six categories are shown below.

		Nonstudent Adults		
	Category	Male	Female	
Very High	(Top 1% - 10%)	6.1 – 7.0	6.1 – 7.0	
High	(Top 11% - 25%)	5.4 – 6.0	5.2 – 6.0	
High Middle	(Top 26% - 50%)	4.8 – 5.3	4.2 – 5.1	
Low Middle	(Top 51% - 75%)	3.8 – 4.7	3.3 – 4.1	
Low	(Top 76% - 90%)	3.4 – 3.7	2.5 – 3.2	
Very Low	(Top 91% - 100%)	1.0 – 3.3	1.0 – 2.4	

		College Student Adults		
	Category	Male	Female	
Very High	(Top 1% - 10%)	5.3 – 7.0	5.0 – 7.0	
High	(Top 11% - 25%)	4.5 – 5.2	4.5 – 4.9	
High Middle	(Top 26% - 50%)	3.9 – 4.4	4.0 – 4.4	
Low Middle	(Top 51% - 75%)	3.1 – 3.8	3.5 – 3.9	
Low	(Top 76% - 90%)	2.8 – 3.0	3.0 – 3.4	
Very Low	(Top 91% - 100%)	1.0 – 2.7	1.0 – 2.9	

If you scored in the "very high" category, then you have all or almost all of the characteristics of the internal person. If you scored in the "high" category, you have many of these characteristics and if you scored in the "high middle" category, then you have at least some of the characteristics. If you scored in the bottom three categories, then this is not one of your preferred styles. Keep in mind, though, that just how internal you are may vary across tasks, situations, and your time of life.

Self-assessment 4.4 Sternberg-Wagner Self-Assessment Inventory the External Style

Read each of the following statements and then rate yourself on a 1 – 7 scale, where each rating corresponds to how well a statement describes you.

1 = Not at all well
2 = Not very well
3 = Slightly well
4 = Somewhat well
6 = Very well
7 = Extremely well

1. When starting a task, I like to brainstorm ideas with friends or peers.
2. If I need more information, I prefer to talk about it with others rather than to read reports on it.
3. I like to participate in activities where I can interact with others as a part of a team.
4. I like projects in which I can work together with others.
5. I like situations where I interact with others and everyone works together.
6. In a discussion or report, I like to share ideas and get input from other people.
7. When working on a project I like to share ideas and get input from other people.
8. When making a decision, I try to take the opinions of others into account.

Interpreting Scores

The way you evaluate your score is to add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. You now should have a number between 1.0 and 7.0. There are six categories of scores, which depend on your status and your sex. These six categories are shown below.

		Nonstudent Adults	
	Category	Male	Female
Very High	(Top 1% - 10%)	6.1 – 7.0	6.1 – 7.0
High	(Top 11% - 25%)	5.7 – 6.0	5.7 – 6.0
High Middle	(Top 26% - 50%)	5.0 – 5.6	4.8 – 5.6
Low Middle	(Top 51% - 75%)	4.0 – 4.9	4.1 – 4.7
Low	(Top 76% - 90%)	3.2 – 3.9	3.0 – 4.0
Very Low	(Top 91% - 100%)	1.0 – 3.1	1.0 – 2.9

		College Student Adults	
	Category	Male	Female
Very High	(Top 1% - 10%)	6.2 – 7.0	6.0 – 7.0
High	(Top 11% - 25%)	5.6 – 6.1	5.6 – 5.9
High Middle	(Top 26% - 50%)	5.1 – 5.5	4.9 – 5.5
Low Middle	(Top 51% - 75%)	4.1 – 5.0	4.0 – 4.8
Low	(Top 76% - 90%)	3.8 – 4.0	2.8 – 3.9
Very Low	(Top 91% - 100%)	1.0 – 3.7	1.0 – 2.7

If you scored in the "very high" category, then you have all or almost all of the characteristics of the external person. If you scored in the "high" category, you have many of these characteristics and if you scored in the "high middle" category, then you have at least some of the characteristics. If you scored in the bottom three categories, then this is not one of your preferred styles. Keep in mind, though, that just how external you are may vary across tasks, situations, and your time of life.

Governments need to deal both with internal, or domestic, affairs and with external, or foreign ones. Similarly, mental self-governments need to deal with both internal and external issues, as people find out very day in their personal lives and at work.

Helen has sold more telecommunications systems than any of her fellow salespeople. Her record in selling systems seems phenomenal to those who are just starting out. These novices often think that Helen has some kind of edge – contacts or perhaps lists of particularly eager customers. In fact, she does have an edge, but it is nothing secret. Helen puts her relationship with her customers first, and the particular product she is selling second. In this way, she has in fact gained more contacts. Putting the relationship first means that she listens to what customers want before trying to sell them anything, and that sometimes she will sell a less expensive telecommunications system, or even wont sell one at all, when she can show the customers how better to most tests, group work is considered cheating. Today, with increasing emphasis on cooperative (group) learning, the pendulum has started shifting in the opposite direction. Educators seem unwilling to accept the fact that there is no one best method of instruction, but rather those students need a variety of methods of instruction, including both individual and group learning.

For all the emphasis on individual performance in may school settings, much of people's performance after schooling is over will be in groups. Unfortunately, many people have had little experience or instruction in how to work in groups. The imbalance can be unfortunate because group performance may be hindered not by the individuals in the group, but by the low quality of their interaction.

LEANINGS OF THINKING STYLES, LIBERAL AND CONSERVATIVE STYLE

Before reading on, take Self-assessments 4,5 and 4.6

Self-assessment 4.5 Sternberg-Wagner Self-Assessment Inventory on the Liberal Style

Read each of the following statements, and then rate yourself on a 1 – 7 scale, where each rating corresponds to how well a statement describes you. 1 = Not at all well

2 = Not very well
3 = Slightly well
4 = Somewhat well
6 = Very well
7 = Extremely well

1. I enjoy working on projects that allow me to try novel ways of doing things.
2. I like situations where I can try new ways of doing things.
3. I like to change routines in order to improve the way tasks are done.
4. I like to challenge old ideas or ways of doing things and to seek better ones.
5. When faced with a problem, I prefer to try new strategies or methods to solve it.
6. I like projects that allow me to look at a situation from a new perspective.
7. I like to find old problems and find new methods to solve them.
8. I like to do things in new ways not used by others in the past.

Interpreting Scores

The way you evaluate your score is to add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. You now should have a number between 1.0 and 7.0. There are six categories of scores, which depend on your status and your sex. These six categories are shown below.

		Nonstudent Adults	
	Category	Male	Female
Very High	(Top 1% - 10%)	6.6 – 7.0	6.5 – 7.0
High	(Top 11% - 25%)	6.0 – 6.5	6.1 – 6.4
High Middle	(Top 26% - 50%)	5.5 – 5.9	5.4 – 6.0
Low Middle	(Top 51% - 75%)	4.9 – 5.4	4.5 – 5.3
Low	(Top 76% - 90%)	4.1 – 4.8	3.3 – 4.4
Very Low	(Top 91% - 100%)	1.0 – 4.0	1.0 – 3.2

		College Student Adults	
	Category	Male	Female
Very High	(Top 1% - 10%)	6.2 – 7.0	6.0 – 7.0
High	(Top 11% - 25%)	5.6 – 6.1	5.6 – 5.9
High Middle	(Top 26% - 50%)	5.1 – 5.5	4.9 – 5.5
Low Middle	(Top 51% - 75%)	4.1 – 5.0	4.0 – 4.8
Low	(Top 76% - 90%)	3.8 – 4.0	2.8 – 3.9
Very Low	(Top 91% - 100%)	1.0 – 3.7	1.0 – 2.7

If you scored in the "very high" category, then you have all or almost all of the characteristics of the liberal person. If you scored in the "high" category, you have many of these characteristics and if you scored in the "High-Middle" category, then you have at least some of the characteristics. If you scored in the bottom three categories then this is not one of your preferred styles. Keep in mind though that just how liberal you are may carry across task situations and your time of life.

If assessment 4.6 Sternberg-Wagner Self-Assessment inventory on the Conservative Style

Read each of the following statements and then rate yourself on a 1 – 7 scale, where each rating corresponds to how well a statement describes you

1 = Not at all well
2 = Not very well
3 = Slightly well
4 = Somewhat well
6 = Very well
7 = Extremely well

1. I like to do things in ways that have been used in the past.
2. When I'm in charge of something, I like to follow methods and ideas used in the past.
3. I like tasks and problems that have fixed rules to follow in order to complete them.
4. I dislike problems that arise when doing something in the usual, customary way.
5. I stick to standard rules or ways of doing things.
6. I like situations where I can follow a set routing.
7. When faced with a problem, I like to solve it in a traditional way.
8. I like situations where the role I play is a traditional one.

Interpreting Scores

The way you evaluate your score is to add up the eight numbers you wrote down above, and then divide by 8. Carry out the division to one decimal place. You now should have a number between 1.0 and 7.0 there are six categories of scores, which depend on your status and your sex. These six categories are shown below.

		Nonstudent Adults	
	Category	Male	Female
Very High	(Top 1% - 10%)	5.4 – 7.0	5.1 – 7.0
High	(Top 11% - 25%)	4.6 – 5.3	4.4 – 5.0
High Middle	(Top 26% - 50%)	3.8 – 4.5	3.4 – 4.3
Low Middle	(Top 51% - 75%)	3.1 – 3.7	2.9 – 3.3
Low	(Top 76% - 90%)	2.2 – 3.0	2.2 - 2.8
Very Low	(Top 91% - 100%)	1.0 – 2.1	1.0 – 2.1

		College Student Adults	
	Category	Male	Female
Very High	(Top 1% - 10%)	4.8 – 7.0	4.8 – 7.0
High	(Top 11% - 25%)	4.2 – 4.7	4.4 – 4.7
High Middle	(Top 26% - 50%)	3.9 – 4.1	3.8 – 4.3
Low Middle	(Top 51% - 75%)	3.1 – 3.8	3.2 – 3.7
Low	(Top 76% - 90%)	2.4 – 3.0	2.8 – 3.1
Very Low	(Top 91% - 100%)	1.0 – 2.3	1.0 – 2.7

If you scored in the "very high" category, then you have all or almost all of the characteristics of the conservative person. If you scored in the "high" category, you have many of these characteristics and if you scored in the "high middle" category, then you have at least some of the characteristics. If you scored in the bottom three categories, then this not one of your preferred styles. Keep in mind, though, that just how conservative you are may vary across tasks, situations, and your time of life.

Individuals with a liberal style like to go beyond existing rules and procedures and seek to maximize change. They also seek or are at least comfortable with ambiguous situations, and prefer some degree of unfamiliarity in life and work.

We are most familiar and often comfortable with people whose styles correspond to our own. Having a liberal style, I tend to respond well to colleagues who want to overturn the establishment. So the people in my field whom I am most likely to seek out are those who believe that the IQ testing business is misguided and who believe that new, better tests are just over the horizon. There are equally good scholars who have done careful scientific research arguing, more or less, for the status quo.

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WRITE YOUR PROFILE DOWN

NAME   :   _____

FUNCTIONS

Legislative   :   _____

Executive   :   _____

Judical   :   _____

FORMS

Monarchic   :   _____

Hierarchic   :   _____

Oligarchic   :   _____

Anarchic   :   _____

LEVELS

Global   :   _____

Local   :   _____

SCOPE

Internal   :   _____

External   :   _____

LEANINGS

Liberal   :   _____

Conservative :   _____

SUMMARY   :

_____

_____

ADDENDUM D

EXAMPLE OF CONTENT ANALYSIS

ADDENDUM D

EXAMPLE OF CONTENT ANALYSIS

PRE-ASSESSMENT

Category	Responses	Subject no.	Fre-quency	Sub-category
Problem solving	Analyse the problem;	1;2;3;4;6;10; 16;17;18;29	10	Analyse the problem
	Look at parties involved	1;2;3;4;6;10; 16;17;18;29	10	Analyse the problem
	Think backwards	1;2;4;6;16	5	Analyse from end to beginning
	Look at cause	1;2;4;6;16	5	Analyse the problem
	Look at root courses	1;2;4;6;16	5	Analyse the problem
	How did it started	1;2;10;20;21;25;26	7	Analyse the problem
	I try to determine what caused the problem	1;2;10;20;21;25;26	7	Analyse
	Consider what I have on hand	1;2;10;20;21;25;26	7	Analyse
	Reason for this	1;2;10;20;21;25;26	7	Analyse
	Where did it go wrong	1	1	Analyse: root cause
	Address it and identify it	1;4;11;15;21;25;26 26;28;29;30	11	Identify problem
	Firstly I make sure that I know exactly what the problem is.	1;4;11;15;21;25;26 26;28;29;30	11	Identify problem

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	Understand the problem	1;4;11;15;21;25;26 26;28;29;30	11	Analyse problem
	Look at options /solutions	1;8;10;14;16;19;29	7	Look at options
	Think of obvious options	1;8;10;14;16;19;29	7	Obvious options to problem solution
	Consult some friends and if they have any views	1;8;10;14;16;19;29	7	Include others in identifying solution (solution)
	Advice on the solution	10;16;19;29	4	Focus on solution
	Choose one right option	1;2;4;19;29	5	One option as solution
	Determine a solution which will be favourable to all parties	1;2;4;19;29	5	One option as solution
	Have an open forum and discuss it (brainstorming)	2;9;10;15;16; 21;24;30	8	Input from others to find solution
	Chat to other people involved, get their views	2;9;10;15;16; 21;24;30	8	Input from others to analyse problem
	Consult some friends and tell them what is bothering me.	2;9;10;15;16; 21;24;30	8	Input form others to analyse problem
	Deal with problem that will make all parties happy.	3;4	2	Solution to problem: other people factor

	Look at what that problem is doing to me.	5;12;21	3	Analyses of problem (self focus)
	How is it going to affect me.	5;12;21	3	Analyses of problem (self focus)
	Deal with people that cause problem.	5	1	Identification of one solution
	No analysis- know what to do right away.	6	1	No analysis
	Understand where I want to be at the end.	6;19	2	One solution-no thorough analysis
	I figure myself how I want to do it.	6;19	2	No thorough analysis
	Source the problem and motive for problem.	7 7;18	1 2	Identify problem Analyse it
	Get information from all relevant sources.	7;18	2	Information gathering
	If problem is wrong- discard it.	7	1	No thorough analysis
	If the problem is not a problem, continue with it.	7	1	No thorough analysis
	No analysis of problem	8;9;19	3	No analysis
	See if one option is suitable, if not then try and think of alternatives.	8	1	One solution; if not, only then more alternatives
	Think of whether it covers all problems.	8	1	Solution to problem

	Whether the consequences will be what I want.	8	1	Analysis and identify consequences
	Try to work out what is needed to solve the problem.	9	1	Solution
	Work out what to do.	9	1	Solution
	Start to tackle the issue until its completed	9	1	One solution
	Add up all the advice and come up with a final decision on how to go about and solve it.	10	1	Solution Summary of information
	Find ways to solve it.	11	1	Solution
	Are there any comebacks as a result (*end of problem solving no further planning*)	11	1	Analysis Consequences
	Define the problem	12	1	Identify problem
	Have I been faced with this before	12	1	Identification of problem
	Use methods that I have used before and solve my problem	12	1	Focus on solution Identification of problem
	Ask for assistance if I am stuck	12	1	Analysis Involve others in analysis
	First get all the facts, i.e. where does it come from and what has it led to, consequences, etc.	13;14;17;22	4	Analysis

	I try to ignore the name of the person who caused it because the tendency is to shift the responsibility to that person and in the act cannot focus on solving it.	13	1	Analysis
	Who are/what resources do I have-are these resources readily available. If not, any other options.	13	1	Planning and look for options
	Having all the resources and taking out person, what do I expect the end results to be.	13	1	Solution (1)
	Look for solutions	14;17	2	Solutions
	Make an informed decision with timelines and follow up on timelines.	17		Implementation Planning
	Plan how I will obtain my objective.	20	1	Planning
	Formalise action plan	21	1	Planning Implementation
	Picture the problem in your mind	23	1	Analysis
	Try and think whether or no I would be able to solve by myself or need assistance.	27	1	Analysis

Category	Responses	Subject no.	Frequency	Sub-category
	Generate no solutions/alternatives	18;30	2	No solution
	No application/no plan of action	30	1	No plan of action
	Don't try to think beyond the obvious – creatively	all	30	No creative thinking
Category	**Responses**	**Subject no.**	**Fre-quency**	**Sub-category**
Decision making	Weigh the pros and cons of the problem	1;2;4;6;8;15;30	7	Analyse problem
	Then follow the one with more of each; if the pros are more than the con's then go with the con's	1;4;30	3	
	Do not generate alternatives	1;3;5;9;11;13	6	
	Don't look at people's views	1;3;5;9;10;11	6	
	Don't take time to think	16	1	
	Don't try to think beyond the obvious	3;9;10;11;13;16	6	
	Usually go with the gut or what feels right/trust your instinct	2;11;16	3	
	Think how my decision is going to impact on my life and decide from there/ how it will benefit me in future	3;10;12	3	
	No analysis	5;16;24	3	

	What ever I decide, will I be able to look back and agree with what I decided (must feel in heart that it is the right decision)/get inner peace about what to do	5;6	2	
	Usually weigh up the alternatives	6	1	
	Try to get as much info as possible	6	1	
	Then try not to make a decision and do something relaxing	6	1	
	Look at the cost and see if I will be able to bear it.	7	1	
	Will decision take me close to where I want to be.	7	1	
	Decide which will suit me and other parties best.	7	1	
	Taking into account my morals as well (when decision is applied)	8	1	
	Take a lot of time to think about it, especially if it is a problem	9	1	
	Then I put it out of my mind for a while. When I feel OK with it I start	9	1	

	rethinking through it.			
	Come up with a solution	9;22	2	
	Begin with what the end result must be.	13;14	2	
	Take examples from a similar situation.	13;17;21	3	
	Use the resources that were used in previous situations	13	1	
	Never lose your focus	13;20	2	
	Then (after what you know it should be - a solution) probe for possible solutions	14	1	
	Speak to people who have been in the business longer than you and find out how they have handled the situation/ask for more time to get info	17;18;19;21	4	
	Speak to your colleagues/probe people for more information	17;27;29	3	
	Read books in library and use the Internet/get enough information	17;21;25	3	
	Analyse the problem to get more information	18;22;23	3	
	Define the problem	18	1	
	Ask for guidance, but implement solution on your own	27	1	

	Ask what the outcome should be, by when, be specific. Start prioritising the solution and implement.	27	1	
	I like to have both sides of the story to make a decision	28	1	
	Understand the issues around the decision	29	1	
	Make decision on own investigation-bottom line-your feeling	29	1	
	Choose the alternative that appears to be the best	30	1	
	I would first relax, calm down, pause, then think	30	1	
	70% top down (own input) and 30% bottom up (other input)	30	1	
	Look at short and long term consequences	4	1	

Category	Responses	Subject no.	Frequency	Sub-category
Conflict handling	Look at the options I have towards solving conflict/try to work out what is needed to solve	1;9;17;27;30	5	Options analyse

	the problem/get all the facts. Analyse it.			
	Discuss situation with the cause or get to the root of the problem/address it and identify the pros and cons/ first get all the facts/identify the problem/know exactly what the problem is	2;10;11;13;19;26;28	7	Identify analyse
	Usually goes with the gut or what feels right	2;11	2	Gut feel-no analysis
	Look at the problem (conflict) and deal with it in a way that will make all parties involved happy/think about what caused the problem/ consider what I have on hand. Reason for this	3;4;9;15;20;29	6	Identify Look at other parties

	Focus on myself-how will it impact on my life and decide from there/feeling is important	3;5;29	3	Focus on self. Focus on feeling
	Usually have a good idea what to do right away	6	1	No analysis or identification of problem
	Look at the worst and see if I will be able to bear it, if it is going to take me close to where I WANT TO BE.	7	1	Focus on self-analyse
	Think of all pros and cons for both options/decide which will suit myself and other parties best. Taking into account my morals as well.	8;24	2	Analyse Focus on self
	Will look at consequences for me now and in future	12	1	What feels right-consequences

	Take examples from a similar situation.	13	1	analyse
	Take note of the facts either mentally or on paper.	14	1	analyse
	Use someone as a soundboard.	14	1	Get others involved
	Open communication- get others involved	16	1	Get others involved
	After facts have been analysed make an informed decision	17	1	analyse
	Ask more questions to understand what the issue is/have to understand the issue/ask more questions. Then decide on solution	21;22	2	Analyse
	Try to see the bigger picture.	23	1	analyse
	Will analyse the problem and give feedback to person after decision.	25	1	analyse

Category	Responses	Subject no.	Frequency	Sub-category
	Acknowledge problem (what is).	26	1	Identify
Category	**Responses**	**Subject no.**	**Frequency**	**Sub-category**
Creativity	Not creative in the work environment	1;2;3;4;5;7;9;10; 12;13;17;19;20;21; 22;23;26;27;28;30	20	Not creative
	Weigh up alternatives (assumption is that there are alternatives generated)	6;8;11;14;15;16; 24;25;29	9	Weigh up alternatives
	Establish whether any work has been done previously.	18	1	analyse
	Use prior experience of other people/experts in the field	27;29;30	3	Use prior experience- not creative

Category	Responses	Subject no.	Frequency	Sub-category
Strategic planning	Look at the options/think and come up with ideas/look at possible solutions	1;8;11;14 16;20;25	7	Generate options
	Look at the pros and cons of the plan. Discuss in an open forum/get input from all the stakeholders/discuss	1;6;28;30	4	Analyse Involve others in planning

	with other people/ask input from others			
	No identification of strategic thinking	3;5;9	3	No strategic planning/ thinking
	Look at parties involved	4	1	Implication for others involved
	Need to have a full understanding of where we want to be/understand where we want to be at the end/how will it influence our future/will first assume what we want to achieve	3;7;10;12 ;13;14;22	6	Identify end result
	Usually weigh up the alternatives/investigate the alternatives	7;8;15;29	4	Generate alternatives
	Use methods we have used before to do strategic planning	12;13	2	Methods used before
	Gather information before the planning session	18	1	Information gathering- analysing
	Take into account factors that will influence outcome/get the bigger picture/look at previous scenarios	20;21;23	3	Take other factors into account

ADDENDUM E

EXAMPLE OF OBSERVATIONS IN THE WORKPLACE DURING TRAINING OF THINKING SKILLS

February 2002 to April 2002

ADDENDUM E

OBSERVATIONS IN THE WORKPLACE DURING TRAINING OF THINKING SKILLS

February 2002 to April 2002

Field notes

First management meeting held after the first training session in effective thinking skills.

Notes: the managers discussed the implementation of a new process in the business unit that would enhance productivity and it was enforced from senior management as part of the world class efficiency development.

The managers trained on the Thinking Skills Programme started to give solutions to the problem without considering all the factors involved.

The consultant and facilitator as part of the management meeting asked the question if they had considered all the factors before providing solutions to the implementation.

Only then did they spend some time on considering the other factors such as training and impact on the people and on productivity.

The observer noted that the managers hadn't internalised the thinking dispositions and thinking tools. It was observed that they needed to

be prompted by the facilitator to be aware of their thinking when dealing with demands and issues in the workplace.

The second observation was made during a departmental meeting where one of the managers was meeting with his sub-ordinates (junior Managers) to discuss departmental issues - technical and people-related issues.

The manager was confronted by the junior managers in respect of the consequences of implementing the new processes; he handled the conflict in an effective way by allowing them to air their views and asked for more opinions. At one stage he wanted to become defensive at their questioning his decisions, but sat back and asked why they were thinking the way they did. This resulted into an open discussion with practical input and it was noted that they considered more factors before making a decision.   The consultant (facilitator) had to ask the question of the mid- and long-term consequences and the manager acknowledged the asking of the question.

After the meeting the consultant discussed the meeting with the manager and he replied that the thinking disposition to take time to think and the thinking tool to listen to other people's views helped him quite a bit to have a more meaningful meeting with his subordinates. He also mentioned that they had come to a better decision after discussing the mid-and long-term effects of implementing a new process.

The third and fourth observations were made in management

meetings of the middle to senior managers and it was after three training sessions of the training programme.

The discussion and decisions were around budgets that had to be cut owing to demands of the international office for the South African company to be more productive and to add value to shareholders.

The middle managers trained in the training programme were calm and asked questions to consider other factors that were at hand. The senior manager didn't want to give them time to discuss the problem at length but once they discovered more factors that would influence the effectiveness of their decisions, he was more open and they came up with a well thought through plan.

What emerged from their discussion was that they were more aware of their thinking processes and before making a critical decision they took time to think about it and asked relevant questions as to what the real goal was and focused again to achieve it. They also planned step- by-step how they would accomplish it. A noticeable difference in their problem-solving process was that they decided that they will include the junior managers and staff in the process to ensure that it was not a top-down decision but that they wanted to work with all the employees to come up with a workable solution.

They decided that they would have a meeting with focus groups to discuss and plan the implementations of the cutting down of costs and to work more efficiently. A main consideration was that they would rather look at their processes than to cut on staff to save money.

ADDENDUM F

EXAMPLE OF SEMI-STRUCTURED INTERVIEW

SEMI-STRUCTURED INTERVIEW

The semi-structure interview was conducted in the work environment by the researcher as a human resources consultant in the business. The interview was done by random selection of participants in the thinking skills training programme.

Researcher:	You have attended two sessions of the thinking skills training programme. Was it useful up to this point?
Respondent 1:	Yes very much so. I am more aware of my thinking when I deal with problems and managing my staff.
Researcher	Where do you use your new knowledge and skills?
Respondent 1:	I am trying to use them when I have to make a decision on a difficult problem
Researcher:	Which of the tools do you use?
Respondent 1:	I am quite good with problem solving, but the CAF helps me to look wider. I suppose that is a disposition as well? I am more aware of other factors that I haven't considered.
Researcher:	Have you noticed a difference in how you solve problems and make decisions?
Respondent 1:	In one or two areas. I have involved more of my staff (OPV) when I have to solve a problem and we managed last week to solve a problem with a difficult customer more satisfactorily.
Researcher:	Can you tell me a little bit more?

Respondent 1:	Yes. The customer had problems with money being paid out and it was long overdue because not all the information was available. We took it on ourselves to go to another department to look for more info and came across the missing information. Before the situation we didn't realise that they might have the information. But we managed to track it down and we were able to pay the money to the client!
Researcher:	What is difficult for you to implement in terms of the thinking dispositions and tools?
Respondent 1:	To take time to think because of the pace of the business. You don't have the luxury of sitting down and looking at all the factors before making a decision. You just have to come up with a quick solution not to stall the process. The problem is, it sometimes gets stalled at higher levels when you need to implement the decision.
Researcher	What consequences do you encounter due to this?
Respondent 1:	We make silly mistakes and create a lot of re-work. And with this we waste money! We have to change it - especially in a closed book business.
Researcher:	Do you have any suggestions as to how we can make the training more effective that will help you to transfer your skills in your day-to-day activities?

Respondent 1:	Yes. We need a visual reminder to use the thinking tools because we fall back to our old way of thinking when we do our daily job.
	We also have to work more with the problems we encounter in our daily operation that we don't have answers for.
Researcher:	We will add it to the programme and design a reminder tool.
	Thank you for your time.

Example of semi-structured interview

Researcher:	You have attended two sessions of the thinking skills training programme. Was it useful up to this point?
Respondent 6:	Yes, I think so. I like spending time with my peers and working in groups to solve problems that we all share during the training sessions
Researcher:	Where do you use your new knowledge and skills?
Respondent 6:	I don't have time to sit down and look at a problem so in-depth. I come up with a solution and we move on. I trust my gut feel.
Researcher:	Which of the tools do you use?
Respondent 6:	I haven't used the tools as I am confident in my problem solving and in the decisions I make.
Researcher	Although you don't use the tools have you noticed a difference in how you solve problems and make decisions?

Respondent 6:	Maybe once or twice when I realised I have to look a bit wider and maybe ask if there are other factors we need to consider. So maybe unconsciously have I started to use the CAF tool!
Researcher	Can you tell me a little bit more?
Respondent 6:	Well, the other day one of the staff had a problem with taking leave and it is a very busy time for us, so we need all the production staff to ensure that we don't have cases not attended to. Our carry-over is the key measurement of how effective we are and our bonuses are linked to it. It is very important that we have a low carry-over. At first I didn't want to grant the leave, but when I thought about it and discussed it with the staff member I realised that this person is so overworked and stressed that by not granting the leave, he won't be able to perform on a high level and he will be negative. He might even influence the other staff and that will result in low morale and you know what happens when the morale is low: productivity goes down. So I granted the leave and he was quite happy and he will be back in a few days feeling better. The others were fine to do his bit because they know they will get the opportunity to go on leave as well. So it worked and our carry-over went down!
Researcher:	What is difficult for you to implement in terms of the thinking dispositions and tools?

Respondent 6:	I don't think I have to use the tools to solve problems because I trust my gut feel and I am normally right. And like I have said, I don't have time to think about a problem at length or ask all these people's input. I can do it myself.
Researcher	What consequences do you encounter due to this?
Respondent 6:	I solve my own problems but sometimes I have to rethink a solution because it didn't work and that might cause that the staff or even me must go back and re-do stuff. I realised with the group work that I might have come up with better solutions, but I just don't have the time for that. Most of the time my solutions work.
Researcher	Do you have any suggestions how we can make the training more effective that will help you to transfer your skills in your day-to-day activities?
Respondent 6:	If we can work with more work problems. We do already, but maybe we can share more of that. I struggle with budgets, how to analyse it, so maybe we can work on that? I think I can learn from the others to do that more effectively. Maybe the tools can help to think more focused?
Researcher	We will add it to the programme. I think the others will benefit from it as well. Thank you for your time.

ADDENDUM G

SAMPLE OF FIELD NOTES

Field notes.

Strategic conference(26 April 2000): were in session the full day. Managers were struggling with innovation in their division. Didn't know how to see the problem differently. I asked the question: what other alternatives do we have? That sparked the ideas by the mangers that attended the programme. They started to give other options. Not all participated. Bit disappointing!

Started to say to each other that they have to look beyond the obvious. I helped a little to ask what is the obvious, but Erika and Mark quickly picked it up and started to give other options. The others followed- as if they needed the prompt to use their training. They came up with a new solution! A change in an old process they always struggled with. They realised that it needed integration with some of the other departments where the problem starts.

Have to work with this problem in the next session: the awareness of their thinking must come from themselves and not always from me.

Departmental meeting(14 May 2000): Mark had a session with his direct reports. The main issue was how to work more effectively with the system they are so depended on. He asked them how they can still deliver the same results without being so depended on the system. The whole group started to give different options as they work with it everyday. This was excellent! He involved all- didn't try to come up with the answer himself or him and his peers. They generated quite a number of different options.

Then they started to focus. He asked them to look at the ones that will really work and what the consequences and sequences will be for each option if they decide to implement it. He managed one manager quite well when he challenged his thinking! He handled it in way as how to get to the best solution and not that the person attacked him as a person. Have to give positive feedback on his thinking skills- much more effective than two months ago!

ADDENDUM H

THINKING SKILLS PROGRAMME

THINKING SKILLS PROGRAMME
FACILITATOR'S ORIENTATION

1. INTRODUCTION

The cognitive training programme and methodology, which were implemented in the business environment, will be discussed.

In practice, training is seen as something you do to others so that they will do something differently. However, doing something differently involves more than knowing something new (Schneier, Russel, Beaty & Baird, 1994). Without access to the decisions about the context and processes surrounding the plan for change, training quickly becomes unrelated to what actually happens. To be effective, training should first be a link between the change agent (facilitator) and the change group (participants and/or managers). Through this link, valid information flows in both directions and is used to make decisions at each end.

A training function that cannot establish itself, as a link cannot generate valid information, cannot promote informed decision making, and will not be taken seriously (Schneier *et al.*, 1994).

A training needs analysis was done in an unstructured way by discussing the problems senior managers and middle managers experience in the business. The most basic need surfaced as they

indicated that they needed managers to think more effectively in an environment that was continuously changing. They needed new ways of conducting their business in order to answer to the needs of shareholders and customers.

The researcher therefore proposed a training programme that would train the middle managers to become more effective thinkers to manage change in the business more effectively. It was crucial to base the facilitation and methodology on adult learning principles so as to ensure transfer of learning.

2. GOAL OF THE PROGRAMME

The goal of the training programme was to develop the adult learner as an effective thinker who would solve problems more effectively, make decisions by thinking more widely than the obvious and create innovative ways of doing things as an effective thinker in a systemic environment. The outcomes of the programme were identified as:

- The participants (managers) would understand how the brain operates to help them understand that they could improve their thinking skills. Their thinking styles would be a basis for this discussion.
- Participants would understand the development in teaching thinking to help them understand how they could improve their thinking skills.
- Participants would understand what thinking dispositions entail.
- Participants would know which thinking tools to use to apply the thinking dispositions needed.
- Participants would know how to solve problems more effectively by using the thinking dispositions and thinking tools.
- Participants would know how to make decisions more effectively

by using the thinking dispositions and thinking tools.

- Participants would know how to be creative in the workplace by using the thinking dispositions and thinking tools.
- Participants would know how to plan strategically in a more effective way by using the thinking dispositions and thinking tools.
- Participants would work with real work-related problems to apply the learning in the training sessions.

3. CONTENT OF THE PROGRAMME

The content of the programme was designed based on research done in the cognitive psychology field (refer to Chapter Two: Teaching of thinking skills) and adult education (refer to Chapter Two: Adult learning). The environmental forces, disruptive change in the organisational world, shaped the reality and need for the intervention (refer to Chapter Two: Change).

The programme focused on the following:

- Thinking styles (Sternberg, 1999: 25-75). The Sternberg Thinking Styles questionnaire was utilised to assess the participants' thinking styles. This was done prior to the intervention and the outcome of the styles and interpretation was discussed in the first session. This gave the participants more insight into their own thinking and served as an introduction to the content of the intervention. The outcome of the questionnaire, coupled with the knowledge of how adults learn, formed the basis of the facilitation style of the facilitator to ensure transfer of learning.
- A brief history of intelligence and the research done on intelligence and cognitive processes and development in adults

(see Chapter Two). This was done superficially and served as background to how thinking can be trained in order for people to become more effective thinkers in a demanding, changing environment.

- Thinking dispositions. The importance of the right disposition to use thinking more effectively was introduced. Perkins *et al.* (1993:5) propose a conception of dispositions that include attention to habits, perceptual sensitivities, and even abilities. The conception puts forth dispositions as a unit of analysis for a broad and fruitful conception of mind. Seven broad thinking dispositions were used: (1) to be broad and adventurous, (2) to work towards sustained intellectual curiosity, (3) to clarify and seek understanding, (4) to be planful and strategic, (5) to be intellectually careful, (6) to seek and evaluate reasons and (7) to be metacognitive (Perkins *et al.*, 1993:6).

- Thinking skills and tools. De Bono's CoRT programme (1) was used to train the participants in knowledge and the use of thinking tools. The CoRT programme is the most appropriate programme for direct integration because the instruments are simple and can be applied widely in the area of teaching thinking skills (Edwards, 1991a; 1991b; 1994b; 1994c; 1995). This programme has delivered excellent results world-wide and over a long period of time in the field of economics, in the industrial area and at higher education institutions (Edwards, 1988 and 1990; Mouton *et al.*, 1990:63; Botha, 1990). Adult learners, who use these tools in everyday life, become more acceptable socially because they act in a thoughtful manner that enables them to stand back and consider all factors and other people's point of view (De Bono, 1986: 34). The tools used in the programme

which enhance the thinking dispositions are the following:

- o CAF: Consider All Factors. This tool is used, for example, with the disposition of being broad and adventurous, as well as being organised in one's thinking.
- o APC: Alternatives, Possibilities and Choices. This tool enhances the dispositions of organised thinking, being clear and precise and broad and adventurous in thinking.
- o OPV: Other People's View. When the adult learner uses this tool, the dispositions of taking time to think and organise one's thinking as well as looking beyond the obvious are cultivated.
- o AGO: Aims, Goals and Objectives. The adult learner uses this tool with the dispositional approach of clear and careful thinking, as well as organised thinking. He/she should take time to set goals, aims and objectives. In the organisation this can be used fruitfully in planning and designing strategy.
- o C&S: Consequence and Sequence. This tool enhances organised and clear thinking. Once again the learner should take time to think to accomplish such dispositional thinking.
- o PMI: Positive, Minus (Negative) and Interesting. The adult learner uses this tool to enhance the disposition to take time to think, to think broadly and adventurously and to achieve clear and precise thinking. It is a very effective tool to use when faced with a complex problem or analysis.
- Practical application of thinking tools and thinking dispositions in real-life problems experienced in the work environment of the participants. The problems were either presented in an analytical

way with budget information or in simulations portraying people issues and customer relationship difficulties.

4. TEACHING METHODOLOGY

Applying the most appropriate teaching method in teaching thinking to adults was one of the key components of the training programme on thinking skills. Adult learning works from the premise that there needs to be a need to know from the participants/managers. The need to know is associated with a variety of experiences, such as encountering poor practice and production, problems that demand solutions or questions that have no answer. The sense of role is another pre-learning condition for managers. More explicitly, the feeling that underpins the start of learning is related to a person's perception of the gap between what he or she is and what he or she should be. In an environment confronted by constant change where the old answers don't work any longer and new thinking is needed, a need to be trained to think more effectively in one's role as a middle manager in an international company was imperative. The teaching methodologies applied focused on teaching thinking effectively as found in the literature and in adult education. These include reflection, relaxation, visualisations, action learning, activities, cooperative group work and transfer strategies for learning.

4.1 Reflection, relaxation and visualisations

A teaching methodology of reflection, relaxation and visualisation was used. These were important cognitive development skills that had to be fostered and the outcome was one of thoughtfulness once the learners had internalised these concepts with other cognitive strategies. Costa (1985:101) comments on this in the following way: *They use fewer trial-and-error tactics, gather information before they*

begin a task, take time to reflect on an answer before giving it, make sure they understand directions before starting a task, and listen to alternative points of view.

Reflection is a critical process. While many people are reluctant to make time for it, few deny its power. Bruner (1986:132) provides such a view:

> *If one fails to develop any sense of reflective intervention in the knowledge one encounters, one operates continually from the inside in- knowledge controls and guides you. If you develop a sense of self, premised on your ability to penetrate knowledge for your own uses, and you share and negotiate the results, then you become a member of the culture-creating community.*

On these concepts it is important to mention Fisher's (1990:129) views:

> *Several processes are associated with reflection. First: the ability to reflect on our thinking before, during and after problem solving. This involves planning, monitoring, and evaluating our thinking. Second is posing questions to ourselves as we are planning, monitoring and evaluating. This 'self'-questioning, reflecting, and regulating may be the essence of metacognitive awareness and control.*

Reflection involves validity testing, which can be an integral element in taking forceful action or which can involve a hiatus in the action process during which a retroactive critique of the content, process, or premises of problem solving takes place. Reflection on assumptions involves critique of these premises that may result in the

transformation of both meaning perspective and the experience being interpreted (Mezirow, 1991).

Reflective learning involves assessment or reassessment of assumptions. Reflective learning becomes transformative whenever assumptions or premises are found to be distorting, inauthentic, or otherwise invalid. Transformative learning results in new or transformed meaning schemes or, when reflection focuses on premises, transformed meaning perspectives (Mezirow, 1991).

Before every session the learners performed a relaxation exercise (Grové, 1994:63). Effective thinking cannot take place if the mind and body are not totally relaxed. Lozanov (1979:258) explains it as follows:

The emotional unjamming creates conditions for calm intellectual-mnemonic and creative activity without anxious tension…

The facilitator played a vital role in creating a relaxed atmosphere to enhance effective thinking and to create the visualisation by playing relaxing, soothing music. This created a relaxed scene for the participants to leave all the problems behind so that they could focus on the learning.

In such a session, the important thoughtful vocabulary used in the session should be repeated. This will ensure better retention of what has been learned (Fisher, 1990:253). At the end of each session the adult learners are encouraged to share their experiences with a colleague and someone at home. This action enhances transfer (Costa, 1985:101). Cognitive actions should be part of the adult

learner and he/she should understand the way he/she chooses to operate (Swartz & Perkins, 1990:1-3).

4.2 Action learning

An action learning methodology (learning to learn by doing) was followed to ensure effective transfer of learning (Marquardt, 1999:34). Action learning uses the learning cycle of Kolb as a basis and is an effective learning methodology to be utilised when teaching adults.

Kolb (Kolb & Fry, 1975) created his model out of four elements:

Concrete experience; observation and reflection; forming abstract concepts and testing in new situations. It was presented in an experiential learning cycle. The essence of action learning is to extract from the new task itself a sustainable desire to know what one is trying to do, what is stopping one from doing it, and what resources can be found to get it done by surmounting what seems to stand in the way (Revans, 1980:287). Revans (1980:287) explains the action as follows:

> *The element of newness in continuing to do the job that one was doing before coming into the action learning programme will, of course, be membership of the set, for whatever option is followed the fellow must, in the sense in which I define action learning, extract the sustainable desire from the new task with the help of a small number of others seeking the same essence.*

In action learning they learned by studying themselves, what they did and thought. They became self aware, and then they worked on learning. This was based on the idea that nothing ever became real until it was experienced (Revans, 1980). Knowledge from direct

experience of the world is different from academic knowledge. It is more singular, unique, and specific to the particular context. Knowing how to spin oneself through successive iterative cycles is central to professional growth and learning.

This process of action learning formed a good basis for teaching thinking skills as the participants formed a group that practised the same role and were faced with the same problems and tasks (In-tact group). They helped each other in the training sessions to see the newness of the jobs that they used to do on a daily basis and the struggle to find answers for with the demands of a changing organisational environment.

Revans (1980) notes that true learning consists mainly in the reorganisation, or reinterpretation, of what is already known. It calls for the learners to understand what may be preventing them from using more fruitfully that to which they already might have access, if only they also knew how to secure that access.

The importance of putting one's ideas and suggestions to continuous test is the essence of every action learning programme. It shows that utility rather than elegance is what managers seek. There is a sense in which these two qualities, between what is good enough to convince the philosopher is, on the one hand, the psychology of management and, on the other, the difference between action learning and operational research. Revans (1980:312) explains:

The action learning fellow will argue: 'So-and–so has convinced me; I will follow his example.' The operational research professional will argue: 'So-and–so has proved it; I now understand how to do it'.

The budget information and case studies used in the sessions were derived from their own business and related to contemporary issues, problems and difficult decisions to be made.

The participants had to implement their thinking skills in their different environments in order to give quality feedback on problems and solutions experienced in the workplace in the next session. The internal email service was utilised as reminders of using the thinking tools as well as sharing effective thinking experiences. It was important to refine their natural question-asking skill until they were brilliant question askers - not just answer givers, but also question askers and solution seekers (Russell, 1996).

4.3 Activities

Activities included creative games, emotional games (for example being in a conflict situation); role-play in problem solving to create new opportunities (action learning) and case studies related to their managerial role as well as to the business environment within which they operate (Kolb & Fry, 1975; Revans, 1980; Marquardt, 1999). Case study material that was used was business specific and was used as confidential material and not allowed to be used in other settings.

4.4 Cooperative group work

To think effectively adult learners/managers should also engage in cooperative group work. A cooperative group is more than the sum of its parts. It is a group whose members are committed to the common purpose of maximising each other's learning. This is also supported by Costa (1985:102) when he notes the following about people (especially learners) working together:

Humans who behave intelligently realise that all of us together are more powerful than anyone of us. Problem solving has become so complex that no one person can do it alone: no one has access to all data needed to make critical decisions: no one person can consider as many alternatives as several people.

Cooperative learning is instruction that involves learners working in teams to accomplish a common goal, under conditions that include the following elements (Johnson, Johnson & Smith, 1991):

- **Positive interdependence**. Team members are obliged to rely on one another to achieve the goal.
- **Individual accountability**. All learners in a group are held accountable for doing their share of the work.
- **Face-to-face promotive interaction**. Work done interactively with group members providing one another with feedback, challenging one another's conclusions and reasoning, and most importantly, teaching and encouraging each other.
- **Appropriate use of collaborative skills**. Learners are encouraged and helped to develop and practise trust-building, leadership, decision-making, communication, and conflict management skills.
- **Group processing**. Learners set group goals, periodically assess what they are doing well as a team, and identify changes they will make to function more effectively in the future.

These elements were used effectively to teach the participants thinking skills and dispositions as they underpin the use of effective thinking skills.

Johnson, Johnson and Holubec (1993a; 1993b) identify potential barriers to group effectiveness. The facilitator had to take note of these barriers and had to ensure that they were overcome for optimal learning to take place in the group. The barriers identified were:

- Lack of group maturity.
- Uncritically giving one-dominant response.
- Social loafing - hiding in the crowd.
- Free riding - getting something for nothing.
- Motivation losses due to perceived inequity - not being a sucker.
- Groupthink.
- Lack of sufficient heterogeneity.
- Lack of teamwork skills.
- Inappropriate group size.

The social learning theorists also argue that higher order thinking, especially metacognition, is enhanced by social interaction in small group discussions. Vygotsky (1975) describes it as follows:

"All higher or cognitive skills originate in, and develop by the individual's interaction with others."

This is also an ideal work structure for brainstorming which is a key operating skill for thinking. The facilitator's role was very important in the effectiveness of this process (Schoenfeld, 1982:10). The facilitator applied the principles of transformative learning and stressed that to be an effective facilitator the following attributes were needed: to be knowledgeable; to show concern for subject learning; to present material clearly; to motivate; to emphasise relevance of material and to be enthusiastic.

4.5 Transfer strategies of learning

An abundance of research beginning with that of Thorndike at the turn of the century showed that transfer of any kind of knowledge is difficult. Perkins and Salomon (1989:22-23) have produced syntheses of the research on transfer of learning and have articulated a high/low road theory of transfer, which offers mechanisms for transfer and predicts when transfer can be achieved. Perkins and Salomon (1989:22-23) argue that transfer needs to be "mediated". While traditional approaches to instruction have taken it for granted that appropriate transfer would occur spontaneously, we must teach for transfer if we want transfer to occur.

Transfer is pursued through the general emphasis on conceptual awareness and through frequent practice in addressing work and general applications (Nickerson *et al.*, 1985:335-336). The Thinking Skills programme was designed as such, so that at the end of each session there was room to discuss how this learning could be implemented. It therefore ties in with the action learning methodology (Revans, 1980; Marquardt, 1999:25). Transfer of learning impacts on the cognitive development of adults (participants) where it involves special types of experience-based knowledge and is characterised by the ability to be reflective in one's thinking and to make sound judgements in everyday life (Merriam & Caffarella, 1998:202).

Transfer of learning is important for transformative learning to take place. The participants needed to learn to negotiate meanings, purposes, and values critically, reflectively and rationally. For the participants as adult learners to change their "meaning schemes" (specific beliefs, attitudes, and emotional reactions) they had to

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engage in critical reflection on their experiences (action learning in role plays, case studies and actual documents), which in turn led to a perspective transformation (Mezirow, 1991:167). Mezirow (1991:167) further states that perspective transformation is the process of becoming critically aware of how, what and why the adult perceives, understands, and feels about his world; changing these structures of habitual expectation to make possible a more inclusive, discriminating, and integrating perspective; and finally, making choices or otherwise acting upon these new understandings.

Two broad approaches to teaching for transfer are distinguished. Each engages a different mechanism for transfer: "bridging" and "hugging". In the case of teaching thinking, the first, "bridging", involves building adult learners' awareness of their knowledge of thinking as such and engaging learners in pondering how to use their repertoire in various situations. The facilitator "mediates" the needed processes of abstraction and connection-making in order to help high-road transfer, pointing out principles and encouraging learners to make generalisations (Perkins & Salomon, 1989:28-29; Swartz & Perkins, 1990:1-3). An example of this was the discussions on conflict handling in the business with staff that were unmotivated. Generalisations were made about when employees become unmotivated as well as about the most common ways to manage unmotivated staff.

The second, "hugging", involves providing considerable varied practice in applying know-how about thinking to problems very similar to those the adult learners would actually face in practical situations, in and out of the workplace. "Hugging" is used to facilitate low-road transfer: this is done by demonstrating linkages, applications and examples

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wherever possible (Perkins & Salomon, 1989:28-29; Swartz & Perkins, 1990:1-3). An example of this would be how customer complaints impact on staff and how to manage such complaints effectively by using the thinking dispositions and thinking tools.

Thoughtfulness depends on a readiness to discern the needs of thinking in novel situations and to transfer powerful ways of thinking to them. Adams (1989:25-27) reacts to this point:

If the processes don't transfer, they cannot even be called THINKING. They can be called LEARNING, MEMORY, OR HABIT, but not thinking. The purpose of a course on thinking is to enhance students' abilities to face new challenges and to attack novel problems confidently, rationally, and productively.

4.6 CONCLUSION

The Thinking Skills Programme that was implemented in the business unit where the participants operate as middle managers was constructed to address adults' need to learn in a specific way. It was constructed to address the challenges of a constantly changing environment where the demands to think more effectively were evident in the problems they had to solve as well as in having to make decisions that involved creative solutions (to design new ways of operating). The problems they had to solve incorporated strategic thinking and planning - a new demand for middle managers in a global environment.

The programme was designed in such a way that it was flexible to address business demands and to change the practical implementation

(action learning) of the programme in order to ensure transfer of learning (dynamic assessment). It was designed to help the participants to think on a meta-cognitive level, to think about their own thinking and to become more thoughtful in their actions.

THINKING SKILLS PROGRAMME

1. GOAL

The workshop will introduce the participants to the principles of effective thinking skills (thinking dispositions and thinking tools) as well as the application thereof.

2. OUTCOMES

The delegates will:

- Understand the need for a more effective thinking (environment).
- Understand thinking dispositions.
- Understand thinking tools.
- Know how to implement thinking tools for more effective thinking.
- Understand how to think more effectively in solving problems/ making decisions/solving conflict and planning strategically.
- Understand how to use thinking tools to think laterally.

3. INTRODUCTION

We live and operate in times of turbulent and disruptive change. To do things and manage our business as we always have done won't help us to excel in a global economy.

To innovate, companies must do things that clash with accepted management practices, with common but misguided beliefs about the right way to manage any kind of work.

In many companies, managers act as if they can keep developing new products, services and solutions by adhering to customary ways of managing people and making decisions.

Managers continue to use methods that force people to see <u>old things</u> in <u>old ways</u>, expecting <u>new</u> and <u>profitable</u> ideas somehow to <u>magically</u> appear.

The definition of insanity says it all:

"The definition of insanity is doing the same thing over and over and expecting a different result!"

This will not spark creativity and innovation! Or more effective thinking!

Practices that are well suited for cashing in on old, proven ways can make innovation impossible! To <u>thrive</u> and <u>survive</u> in the long term, companies must keep inventing (or at least keep uncovering) new ways of <u>thinking</u> and <u>acting.</u>

In the long run, no company can survive by relying only on established and proven actions. To make money later, companies need to try new things, to "explore" new possibilities.

This means experimenting with new procedures, hiring new kinds of people and inventing and testing new technologies.

New ideas need to be invented (or imported) to satisfy <u>customer demands</u>, to enter <u>new markets</u>, to gain on <u>advantage</u> over competitors, or at least to keep the pace.

It is clear that we need a new way of thinking to be innovative. We need to think creatively!

This workshop will focus on our effective thinking, how to unleash it and apply it to become innovative in the business – and in our every-day lives. We have to understand how our brains operate to use our thinking skills more effectively.

THE HUMAN BRAIN:

Our goal is to enhance our mental functioning in certain areas that psychologists refer to as cognition.

Cognition refers to the ability of our brain to <u>attend</u>, <u>identify</u> and <u>act</u>. More informally, cognition refers to our thoughts, moods, inclinations, decisions and actions.

Included among the components of cognition are <u>alertness</u>, <u>concentration</u>, <u>perceptual speed</u>, <u>creativity</u> and <u>mental endurance.</u>

Each of these components of cognition has two things in common: Firstly, each is dependent on how well our brain is functioning. Secondly, each can be improved by our own efforts.

FACTS ABOUT YOUR BRAIN

The adult human brain weighs about 1,2kg and consists of 100 billion nerve cells or neurons along with an even greater number of non-neuronal cells called glia, interspersed among the neurons.

The neurons are responsible for the communication of information throughout the brain.

The neurons are linked to one another by means of a million billion neuronal connections called synapses.

Any of the brain's 100 or 50 billion neurons can potentially communicate with any other via one or more linkages.

Linkages, once formed, are strengthened by repetition. At behavioural level, this takes the form of a habit.

While it's true that certain areas are specialised (such as the centres for processing sight, sound, touch and other qualities and properties), the largest portion of the brain, the association cortex, is devoted to establishing networks and thereby linking everything together throughout the brain. As a result of this networking, you don't separately see, hear, taste and feel your breakfast bagel – you experience it as a unity.

The <u>basal ganglia</u> (below the cerebral hemispheres) enable you to do such things as skilfully manoeuvre your way through heavy traffic, while simultaneously rehearsing what you're going to say at the business meeting later in the morning.

In computer terms, the <u>cerebral cortex</u> writes the software programs for actions and, after some practice on your part, the <u>basal ganglia</u> take over to run the programs that enable you to carry out the actions.

The cerebellum is integral to <u>solving problems</u>, or remembering someone's name, or maybe just doing nothing more than sitting and thinking.

Neuroscientists have known for years that any skilled activity enhances the cerebellum. In addition, we know that imaging or mentally concentrating on the activities can accomplish a similar result. Of course, that doesn't mean you can become a musician or an athlete by thought alone, you have to undertake the discipline of learning how to play the violin or perfecting your tennis hand.

But once you've made progress in your training, imaging can help activate and sustain the necessary circuits.

And what about the emotional response to experiences?

That's when the limbic system kicks into gear. The limbic system is a shorthand term for the brain structures within and below the cerebrum. Its most important components are the cingulated gyrus in

the cerebrum and the hippocampus and amygdale buried below the cerebral hemispheres.

One of the great mysteries of the human brain concerns how these electrical and chemical codes are converted into your desire for that pizza.

Communication in the brain changes from an electrical impulse to a chemical one. Neurotransmitters (chemical messengers) are released from the messenger cell and diffuse across the synopses (connection point/area) to lock onto a specialised receptor. Advances over the past three decades in our knowledge about the brain's microscopic and chemical organisation have made possible successful treatments for psychiatric illnesses like depression and anxiety.

We understand how the brain operates. The next step will be to understand how to use our thinking more effectively.

A skilled carpenter knows which tool to use and how to use it. The thinking tools we need to develop and train will fulfil the same operation as the tools of the carpenter in the mind of a skilled thinker. The skilled thinker knows which tool to use and how to use it. This is exactly the opposite of drifting back and forth on a current of emotion (De Bono, 1988).

We need to understand the relationship between three important components of our minds and how we apply it.

These three components are:

Knowledge: Education already focuses on this since most subjects are knowledge subjects. There is no substitute for knowledge. On the other hand, knowledge is no substitute for everything else. Complete absolute knowledge would make logic and thinking unnecessary. **Thinking is the use of knowledge to achieve a purpose that cannot be achieved immediately.**

Intelligence: this refers to "innate" ability, whether inherited or acquired through early stimulation in an environment. This innate ability is a potential which has to be expressed in an operating skill (such as thinking) to be effective. Thinking is related to IQ, as driving is related to driving a car is related to the car itself. It is a mistake to assume that the more able do not need to acquire thinking skils. We can't do much to develop the innate ability but we can develop thinking skills. **An increase in this skill can make up for deficiencies in the other two areas.**

Thinking: It represents the practical use of knowledge for a purpose (or pleasure). Thinking skills are not a substitute for knowledge or IQ, but a way of expressing them. Well developed thinking skills may make **good use of limited knowledge or ability** (De Bono,1991)**.**

Acquiring the skill

Some skill in thinking may be acquired naturally through ordinary

everyday living - it is not easy to transfer this skill to new situations. Some skill in thinking may be required as spin-off from other trained courses – but this tends to be tied to particular information. There is no reason why a deliberate attempt to develop thinking by directed practice should not be added to these other methods, especially as entrepreneurial results suggest it can be effective.

One advantage of developing thinking skills directly is that the skill can be applied to any situation since it has not been developed in a specific knowledge area.

Another advantage of the deliberate method is that it becomes possible to separate thinking skill from ego. One should be able to say: "My thinking in that situation was very poor" without condemning oneself as a dunce. Thinking is not natural: like swimming or riding a bicycle it becomes natural only after you have learned how. With thinking, however, failure is not as obvious as drowning or falling off a bicycle.

Thinking has to deal with messy situations in which information is quite incomplete. Thinking is concerned with exploring our own ideas and experience and that of others. All the time the effort is directed towards seeing things so clearly that we know what to think, feel or do at the time. In a way logic itself is only a device to enable us to see clearly what is implied in the starting assumptions (De Bono, 1991).

THINKING DISPOSITIONS
(Perkins, Jay & Tishman)
A thinking disposition is a thinking attitude and it includes feelings and

values.

A thinking disposition helps you to think in a different paradigm; a different frame of mind (Perkins, Jay & Tishman, 1993).

We will focus on the following four thinking dispositions:

- Take time to think.
- Think beyond the obvious.
- Think clearly and precisely.
- Organise your thinking.

What does it mean to use thinking dispositions?

A practical example will help to explain it.

You have a difficult problem to solve. How would you go about solving the problem?

Problem:

Productivity, as well as morale, is quite low in your department. How would you solve the problem?

Now ………. Use the Disposition – Take Time to Think ………. In solving the following problem:

You have a well performing employee and want to reward the person. Ideally the best solution would be…

Now ……. Take time to think…..
The solution?

To use and implement <u>thinking dispositions</u>, we need <u>thinking tools</u> to <u>think</u> more <u>effectively.</u>

THINKING TOOLS

(Edward De Bono)

As the carpenter we need a toolbox of thinking tools to develop our thinking skill.

The tools are attention-directing tools that will help us to focus on specific elements of the thinking process and the purpose for which we need to think.

TOOL 1

P M I

P = POSITIVE

M = MINUS (NEGATIVE)

I = INTERESTING

We use this tool when we need to solve a problem and find a solution to the problem.

It's important to notice that when we use the thinking tools we have to focus on one aspect of the tool at a time.

EXAMPLE

Let's think of a situation in our own environment. Listing of OM on the London Stock Exchange.

- What was positive about the exercise? Focus only the negative outcomes of this action for five minutes.

- What was negative about the exercise? Focus only the negative outcomes of this action for five minutes.
- What was interesting about the exercise? Focus only on the interesting outcomes of the exercise (this will force us to move beyond the obvious, therefore we will produce creative thinking).

This is the most important tool in the toolbox. If you master this tool, all the others will be very easy to use.

EXERCISE

Create your own problem and work in the group to solve the problem by using the PMI tool. (15 minutes)

DEBRIEF (10 MINUTES)

What was the most difficult to do or use with this tool?

Why is it so difficult?

What do you need to do master this tool?

TOOL 2

C A F

C = Consider

A = All

F = Factors

We use this tool when we need to solve and analyse a problem and to ensure that we have considered all factors to come up with a workable solution to the problem.

EXAMPLE

The scenario: the desert in Ohio. Long roads cross the desert from one end to the other and people need to travel on these roads to reach their destinations. A huge problem of road accidents occurs on these roads and the government of the state realised they needed to solve this problem as soon as possible. The main cause of the accidents was the sand on the roads and this caused a problem with visibility.

They thought very hard about how to solve this tricky problem and at the end they came up with a great solution!

Can you come up with a solution to the problem? (10 minutes)

EXERCISE

Create a work related problem you recently experienced and where your solutions didn't work. Apply the CAF tool to help you to come up with a better solution. (15 minutes)

DEBRIEF (10 minutes)

Identify the wrong thinking or ineffective thinking in your process.

What difficulties did you experience in using the tool?

How can we ensure that we will use the correctly in our process of analysing a problem to come up with a solution or solutions?

TOOL 3

A G O

A = AIMS

G = GOALS

O = OPPORTUNITIES

Although there are differences between the three words, these differences are ignored for the sake of the attention-directing tool. There are circumstances where one or the other of the terms would fit best, but in general the task is to set up objectives or to pick out the objectives that seem to be in use.

EXAMPLE

For example "doing an AGO" on the aims of a car designer might turn up the following:

Fit the market trend and need (looking ahead as well)

Right price bracket

Distinctive advertisable features

Economic to run

Reliable

eye-catching STYLE

EXERCISE

Spell out the AGO in the following situations

Running a city police force

Buying a holiday house

Work related situation (in group)

WHAT WAS THE OUTCOME OF YOUR AGO session?

What did you find difficult to do?

How did it help you to come up with better objectives?

How will you use in future? Give examples of situations.

TOOL 4

C & S

C – CONSEQUENCE

S = SEQUENCY

The C&S thinking task is an instruction to consider deliberately the consequences of an action or decision. In doing the C&S there is the usual attempt to focus on the frame of the moment (time frame). For example: immediate consequences (6 months to 1 year); more than 1 year; medium term (2 – 5 years) and long term (more than 10 years).

The exercise is particularly difficult partly because it is unnatural. The difficulty arises from our reluctance to assign time zones. This tool will help to get rid of the haziness of when things might happen.

The experience scan that is attempted with such a tool as C&S and CAF is part of the general broadening of perception that that has more to do with wisdom than with cleverness. The thinking with this tool has to do with uncertainty and speculative thinking and is based on "may be" and "could be". This is crucial for forecasting and strategy.

EXAMPLE

Do a C&S on the following topics:

Office work can be done at home via computer terminals (5 minutes).

The invention of a harmless happiness pill (5 minutes).

EXERCISE

Identify a strategy initiative in your work environment and do a C&S on it. The time spans are as follows: immediate (6 months); medium term (18 months); medium to long term (18 months to 3 years) and long term (5-10 years) (15 minutes).

DEBRIEF

What did you find difficult using the tool?

How did it help to broaden your thinking?

What were the outcomes of your exercise?

How can you ensure the transfer of this tool in your daily thinking?

TOOL 5

O P V

O = OTHER
P = PEOPLES
V = VIEWS

In using this tool the thinker tries to put himself in the shoes of the other people involved in the situation in order to look at the world from that position.

There are two parts to this exercise. The first part involves the identification of the other people who are really part of the situation. The second part involves getting into the "shoes" of all these other people.

EXAMPLE

Let's do an OPV on the rise in the price of basic farm produce.
The first part involves identifying such parties as the farmers, wholesalers, retailers, food processors, food buyers, housewives, people in general, economists, government, etc.

Then it is a matter of getting inside the thinking of each of these.
For example the retailer may be pleased because if he keeps his usual multiple of buying price for his selling price he will get more money. On the other hand, if people buy less or shift to another sort of food he

may lose out. Food processors may suffer because of the increased price of the food they have to buy. On the other hand, if people shift from fresh food to cheaper processed food, the processor may benefit. Can you do the rest?

Doing an OPV does not mean that one puts sane and rational arguments of the sort one may hold oneself. Nor does it mean to put into their mouths complaints and irrationality in order to condemn their point of view. It means objectively trying to look at the world from the point of view - and perhaps adding what is thought to be the actual point of view. In other words, it is a blend between the "position" point of view and the "actual" point of view.

EXERCISE

Do an OPV on the following situation.

The sales manager of a publicly owned company is told that bribery is essential for doing business in a particular country.
Identify a difficult situation in you work environment that involves other parties and do an OPV on the situation.

DEBRIEF

How did the tool help you to get a broader and more objective view of the situation?
What did you find difficult in the exercise?
Where and how can you use this tool in your work environment?

TOOL 6

A P C

A = ALTERNATIVES
P = POSSIBLITIES
C = CHOICES

The three words are there in order to make it pronounceable. In different situations one or other word may seem more appropriate but no attempt should be made to distinguish between them. Doing an APC means making a deliberate effort to generate alternatives at that particular point. There is no magic about it and at the same time there is a lot of effectiveness in it. It converts a general desire into a specific operating instruction (or executive concept).

APC can be used in different situations. For example:

Explanation
Hypotheses
Perception
Problems
Review
Design
Decision
Course of action
Forecasting

EXAMPLE

Problem

With problems, APC can be done at several points. The first is in the definition of the problem. The best definition of a problem can only be reached by finding the solution, and then working backwards to the definition. But we can look at different definitions for a problem.

Do an APC on alternative definitions of the **peak travel problem in city transport.**

When it comes to tackling the problem we can generate a number of different approaches instead of just searching for the best one from the start.

EXERCISE

Identify a review situation at work that you feel you could have done differently or one you are struggling with currently and do an APC on it.

DEBRIEF

How did the tool help you come up with more alternatives?

What was the outcome of your exercise?

How will you ensure that you will make use of the tool at work?

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