

**A STUDY OF THE IMPACT OF WORKSHOPS ON THE TEACHING
OF THINKING SKILLS ACROSS THE PRIMARY SCHOOL
CURRICULUM UPON THE SUBSEQUENT CLASSROOM
PRACTICE OF PARTICIPANTS**

Deborah Leyland Evans

1995

**A STUDY OF THE IMPACT OF WORKSHOPS ON THE TEACHING
OF THINKING SKILLS ACROSS THE PRIMARY SCHOOL
CURRICULUM UPON THE SUBSEQUENT CLASSROOM PRACTICE
OF PARTICIPANTS**

Deborah Leyland Evans

Submitted as the dissertation component
(which counts for 50% of the degree)
in partial fulfilment of the requirements
for the degree of Master of Education
in the Department of Education
University of Natal
Pietermaritzburg

February 1995

ABSTRACT

This study focused on the responses of teachers to a curriculum development project which introduced them to the teaching of Thinking Skills in the primary school. The aim was to establish whether exposure to a series of workshops on both the theoretical and practical aspects of specifically teaching Thinking Skills and problem-solving across the curriculum using the TASC framework, would effect positive changes in the classroom practice of participants.

The literature on the teaching of Thinking Skills was reviewed in order to establish what programmes, methods and approaches are currently being used internationally and locally. Issues related to school based curriculum development were explored with a view to evaluating whether the curriculum initiative undertaken could contribute to better teaching and more effective learning in our schools.

A qualitative, participatory research method was applied. Eighteen teachers from five schools representing each of the five, formerly segregated, education Departments in the KwaZulu-Natal region participated in the study. The action research design chosen enabled the researcher to collect data over a period of nine months while interacting with her subjects at a series of workshops at a central venue, as well as at each school site. The design, application, analysis of findings and limitations of the research study are described and recorded.

The findings indicated some positive shifts in teachers' views of themselves as agents of change towards a more relevant, participatory and meaningful curriculum. The innovation under discussion was found to fulfil many criteria suggested in the literature as necessary for more wide-scale change towards better teaching and learning. It was possible to make certain recommendations from the findings for curriculum development which enables teachers to develop their professional knowledge and improve practice.

DECLARATION

I hereby declare that this dissertation is my own work. It is being submitted in partial fulfilment of the requirements for the degree of Master of Education (Curriculum Development) in the Department of Education, University of Natal, Pietermaritzburg. It has not been submitted before for any degree or examination in any other university.

A handwritten signature in cursive script, reading "D. Evans", written over a dotted line. The signature is written in black ink and is positioned above the printed name.

Deborah Leyland Evans

February 1995

ACKNOWLEDGEMENTS

I wish to thank Prof. Ken Harley, Harvey Adams and Mrs Belle Wallace-Adams for their guidance and inspiration during the course work for this degree in Curriculum Development. Mrs Wallace-Adams encouraged me to embark on the course to give coherence and theoretical clarity to my interest in the teaching of Thinking Skills in the primary school. As supervisor for the dissertation she helped to give a clear, logical structure to my writing.

I would also like to acknowledge the roles of the Network Committee (Natal-KwaZulu) and the Curriculum Development Unit, University of Natal, Pietermaritzburg, in setting up the structures for the TASC project which provided the opportunity for this research study.

I am indebted to Mrs Adele Branch, Mrs Renetta Bosse, Mrs Joan Marwick and Mrs Jenny Abrams for their typing. Jenny Thomson was responsible for the final editing and presentation of the document, for which I am most grateful.

Special thanks go to my husband, Glyn, and sons Steven, Geoff and Iain for their interest and support during the last two years.

Finally, I wish to acknowledge each member of the 1993/4 M.Ed. group and my colleagues at work, and thank them for their encouragement and friendship at this challenging time.

TABLE OF CONTENTS

ABSTRACT	(i)
DECLARATION	(iii)
ACKNOWLEDGEMENTS	(iv)
CHAPTER	Page
1. INTRODUCTION	1
1.1 Background to the study	1
1.2 Developments in cognitive education	1
1.3 'Thinking Actively in a Social Context' (TASC): A framework for school based curriculum development	2
1.4 The focus of the dissertation	3
1.5 The research design and methodology	3
1.5.1 Statement of the problem and reasons for the research	3
1.5.2 The research hypothesis	4
1.5.3 Choice of qualitative methods	5
1.5.4 Action research / case study approach	6
1.5.5 Techniques for data collection	6
1.5.6 Analysis of data	7
1.6 The TASC project: analysis of impressions and interpretation . . .	7
1.7 Recommendations and limitations of the study	9
1.8 Conclusion	9

Table of Contents (continued)

CHAPTER		Page
2.	REVIEW OF RELATED LITERATURE AND SIGNIFICANT CONCEPTS IN THE RESEARCH	11
2.1	Introduction	11
2.2	The Thinking Skills movement	12
2.2.1	What is this 'new' kind of thinking that we need in schools? . .	14
2.2.2	Creative thinking	16
2.2.3	Critical thinking	17
2.2.4	Problem solving	19
2.3	Why teach thinking?	20
2.3.1	Approaches to the nature of intelligence	20
2.3.2	Recent theories about learning	22
2.3.2.1	Metacognition	24
2.3.2.2	Strategy instruction	25
2.3.2.3	Self-regulated learning	25
2.3.2.4	Modelling	26
2.3.2.5	Transfer	26
2.3.2.6	Mediation	27
2.3.3	Summary of reasons for teaching thinking	27
2.4	The South African context	28
2.4.1	Changing views of teaching	29
2.4.2	The disabling curriculum : methodology	30
2.4.2.1	Memorisation and rote-learning: The teacher as dispenser of knowledge	30

Table of Contents (continued)

CHAPTER		Page
2.4.2.2	Pupil passivity	31
2.4.2.3	No integration of subject matter: lack of `scaffolding' / lack of relevance	32
2.4.2.4	Competitive classroom climate / little co-operative learning . . .	33
2.4.2.5	Teachers do not encourage independent thinking	34
2.4.2.6	Examinations-driven system of education	35
2.4.2.7	Physical environment	36
2.4.2.8	Poorly qualified teachers: lack of professional development . . .	36
2.4.3	Summary of the disabling curriculum	38
2.5	Pointers to change	38
2.6	Programmes, methods and approaches	40
2.7	Approaches to the teaching of thinking	41
2.7.1	The adjunct model	42
2.7.1.1	Project Odyssey	42
2.7.1.2	The CoRT programme	43
2.7.1.3	Instrumental Enrichment	45
2.7.2	The infusion model	48
2.7.2.1	Philosophy for Children	50
2.7.2.2	Logo	51
2.7.2.3	Project IMPACT	52
2.7.3	The integrated approach	53
2.7.3.1	Instrumental Enrichment / CASE programme	54
2.7.3.2	Keys to Thinking	55

Table of Contents (continued)

CHAPTER		Page
2.7.3.3	Intelligence Applied	56
2.7.3.4	The TASC (Thinking Actively in a Social Context) framework	57
2.8	Methods common to all approaches	60
2.9	Conclusion	61
3.	SCHOOL BASED CURRICULUM DEVELOPMENT: RESEARCH DESIGN AND METHODOLOGY	62
3.1	Introduction	62
3.1.1	School-based curriculum development	63
3.1.2	Teachers at the centre of reform	63
3.1.3	The advantages of school based curriculum development	64
3.1.4	SBCD - a contested field	65
3.1.5	Justification for school based curriculum development despite limiting factors	66
3.2	SBCD: the TASC framework as a vehicle for change	67
3.2.1	The Workshop approach in the TASC project	68
3.2.2	Workshop methodology	69
3.2.3	Summary of workshop approach and the SBCD movement	70
3.3	The research design and methodology	71
3.3.1	Background to the study	72
3.3.2	Statement of the problem and reasons for the research	75
3.3.2.1	Personal experience of problems	75

Table of Contents (continued)

CHAPTER		Page
3.3.2.2	Understanding through course work	76
3.3.3	Sites and subjects	77
3.3.3.1	Choice of schools	77
3.3.3.2	Selection of subjects	79
3.3.3.3	Access and ethics	81
3.3.4	Intervening with a Thinking Skills approach : the hypothesis	83
3.3.5	Choice of design and method	85
3.3.6	Qualitative vs quantitative methods	86
3.3.6.1	Advantages of a qualitative approach	87
3.3.7	Action-research: case-study and school-based curriculum development	88
3.3.7.1	What is action research?	88
3.3.7.2	Pros of an action research approach	91
3.3.7.3	Limitations of action research	92
3.3.8	'Case study' as a format for action research in this dissertation	95
3.3.8.1	Features of the case study	95
3.3.8.2	Some problems related to the case study	96
3.3.8.3	Summary of reasons for choice of design	97
3.3.9	Data collection techniques	98
3.3.9.1	Field notes:	98
3.3.9.2	Field notes and participant observation / advantages and limitations	99

Table of Contents (continued)

CHAPTER		Page
3.3.9.3	Details of time spent in the field	99
3.3.9.4	Use of the tape-recorder/observation schedules	100
3.3.9.5	Flexibility	101
3.3.9.6	Limited scale of the sample	101
3.3.9.7	Focused group discussions and interviews	102
3.3.9.8	Interviews	103
3.3.9.9	Questionnaires	105
3.3.10	Triangulation	107
3.3.11	Analysis of data	108
3.3.12	Summary and conclusion	109
4.	DESCRIPTION OF THE TASC PROJECT: CONCURRENT ANALYSIS OF IMPRESSIONS, INTERPRETATIONS AND CONCLUSIONS	111
	Time-Order Frame	111a
4.1	Introduction	112
4.1.1	First introductory lecture: The TASC framework: rationale, aims and the teaching principles	112
4.1.2	The centralised workshops	116
4.1.3	Planning for school visits	118
	Forward Planner	118a
4.2	PHASE ONE	119
4.2.1	WORKSHOP 1: Session I	119

Table of Contents (continued)

CHAPTER		Page
4.2.1.1	Analysis of issues arising from the group discussion	121
4.2.2	WORKSHOP 1: Session 2	152 ←
4.2.2.1	Basic Thinking Skills	125
4.2.2.2	The Tools for Effective Thinking	127
4.2.2.3	The Problem Solving Wheel	127
4.2.2.4	Brainstorming: a tool for effective thinking	128
4.2.2.5	Keywords: a basic thinking skill	128
4.2.2.6	Making mind maps: a tool for effective thinking	129
4.2.2.7	Knowing directions - orientation	129
4.2.2.8	Observation and comments on the skills session	130
4.2.3	WORKSHOP 1: Session 3	130
4.2.3.1	Observation and comments on session 3	131
4.2.4	Overall summary of observations, impressions and interpretations of the first centralised workshop	132
4.3	PHASE ONE: Follow-up visits to schools, classroom observations and interviews with teachers	133
4.3.1	First visit to School A	134
4.3.1.1	Analysis	136
4.3.2	First visit to School B	137
4.3.2.1	Analysis	139
4.3.3	First visit to School C	141
4.3.3.1	Analysis	144

Table of Contents (continued)

CHAPTER	<u>Page</u>
4.3.4	First visit to School D 146
4.3.4.1	Analysis 148
4.3.5	First visit to School E : staff workshop and classroom observation 150
4.3.5.1	Analysis 154
4.3.6	Overall summary and conclusions of PHASE ONE 155
4.3.6.1	Analysis in terms of practical implementation and SBCD 156
	Forward Planner 160
4.4	PHASE TWO 161
4.4.1	WORKSHOP 2: Session 1 161
4.4.1.1	Administering a questionnaire 165
4.4.2	WORKSHOP 2: Session 2 166
4.4.2.1	Comparison 166
4.4.2.2.	Other People's Views 168
4.4.3.	Overall summary of WORKSHOP 2 and arrangements for next school visit 169
4.5	PHASE TWO: Follow-up school visits and observation of Thinking Skills lessons 170
4.5.1	School A: Implementation of Thinking Skills, observation and teacher interviews 170
4.5.1.2	Analysis 173
4.5.2	School B: Implementation of Thinking Skills 174
4.5.2.1	Analysis 176
4.5.3	Inability to gain access 177

Table of Contents (continued)

CHAPTER		Page
4.5.3.1	School C	177
4.5.3.2	School D	177
4.5.3.3	School E	178
4.5.4	Analysis	179
4.5.4.1	Summary in terms of observation and interviews	179
4.5.4.2	Summary in terms of action research design	179
	Forward planner for PHASE THREE	182
4.6.	PHASE THREE	183
4.6.1	WORKSHOP 3	183
4.6.1.1	Report-back on school visits	183
4.6.1.2	Enviro-picture building game	184
4.6.1.3	Prioritization: a tool for effective thinking	184
4.6.1.4	The TASC problem-solving wheel and how to apply it in a problem situation	185
4.6.1.5	The importance of metacognition and transfer	187
4.6.1.6	TASC materials for trialling	187
4.7	PHASE THREE: Follow-up visits to schools, staff workshops, observation and interviews	188
4.7.1	School A: third school visit	188
4.7.1.1	Analysis	189
4.7.2	School B	189
4.7.3	School C	189
4.7.3.1	Thinking Skills Lesson - Prioritization	190

Table of Contents (continued)

CHAPTER		Page
4.7.3.2	Thinking Skills lesson - Mind-mapping and classification	191
4.7.3.3	Analysis and comment	191
4.7.4	School D - second school visit: observation of Thinking Skills lessons and interviews	192
4.7.4.1	Thinking Skills lesson - Organisation	192
4.7.4.2	Thinking Skills lesson - Prioritization	194
4.7.4.3	Analysis	197
4.7.5	School E - second school visit: observations of Thinking Skills lessons - Observations	197
4.7.5.1	Thinking Skills lesson - Comparison	198
4.7.5.2	Thinking Skills lesson - Comparison	200
4.7.5.3	Thinking Skills lesson	200
4.7.5.4	Analysis	201
4.7.6	Overall summary of PHASE THREE and analysis of findings .	202
	Forward Planner	205
4.8	PHASE FOUR	206
4.8.1.	Introduction	206
4.8.2	WORKSHOP 4	207
4.8.2.1	Session 1	207
4.8.2.2	Session 2	209
4.8.3	Visit to school D	210
4.8.4	Responses to opinionnaire	210
4.8.5	Summary of PHASE FOUR	211

Table of Contents (continued)

CHAPTER		Page
4.8.6	Conclusion	212
	Action research spirals - graphic organisers	213
	Block analysis of the action research stages	217
5.	SUMMARY OF RESEARCH PROCEEDINGS : FINDINGS, LIMITATIONS AND RECOMMENDATIONS	218
5.1	Introduction	218
5.2	Summary of the process	219
5.3	Limitations and weaknesses of the project	220
5.3.1	Subjectivity and bias	221
5.3.2	Choice of subjects	222
5.3.3	Metacognition and transfer hampered by language difficulties . .	222
5.3.4	Inconsistent approach	223
5.3.5	Participants not involved in the choice of intervention	223
5.3.6	Co-operative planning - failure to transfer to school situation . .	224
5.3.7	Action-research and the skills of the enquirer	224
5.3.8	Failure to address the problem of lack of parental involvement .	225
5.4	Summary of findings in terms of TASC's aims for the teachers, the learners and the curriculum	225
5.4.1	Teachers and pupils as learners	225
5.4.1.1	Self concept and increased participation	226
5.4.1.2	Learning how to learn	226
5.4.2	The teachers	227

Table of Contents (continued)

CHAPTER		Page
5.4.2.1	Change of role	227
5.4.3	The curriculum	228
5.5	The research findings in terms of criteria for more wide-scale change	228
5.6	Recommendations	231
5.7	Addressing the problems of metacognition and durability of Thinking Skills programmes	235
5.7.1	Metacognition	235
5.7.2	Transfer	235
5.7.3	Durability	236
5.8	Conclusion	236
REFERENCES	238
APPENDICES	255

CHAPTER 1

INTRODUCTION

1.1 Background to the Study

In 1992 a Joint Inter-Departmental Committee for primary schools was set up in KwaZulu-Natal anticipating the achievement of a unified structure for education in the region by April, 1994. Inspectors, advisers and principals from each of the five previously segregated Education Departments agreed that a committee would facilitate networking between Departments. Because of apartheid policies applied to education, administrators and teachers in South Africa have had little opportunity to meet across colourlines and to share ideas about teaching and learning or jointly plan initiatives for professional development. The Network Committee, therefore, began planning a number of Inter-Departmental projects. The TASC ("Thinking Actively in a Social Context") project was one of these initiatives. The underlying rationale for the introduction of Thinking Skills in the school curriculum is documented by Mathfield (1992). The TASC theoretical model (Adams and Wallace, 1990) which evolved largely out of research done in KwaZulu-Natal over the last ten years was considered by the Committee as a justifiable framework for a local curriculum development and teacher training initiative (Mathfield, 1992: p113-114).

1.2 Developments in cognitive education

The emphasis on the teaching of Thinking Skills has become a world wide phenomenon in recent years (Sternberg 1985a; Adams, 1989). International conferences on thinking are

held annually. In South Africa the first national conference of the International Association of Cognitive Education (IACE) was held in September 1994. Its purposes, amongst others, included the following:

- to advance the cognitive education of children, youth and adults.
- to promote, stimulate and disseminate application of knowledge on the development, acquisition and application of logical thought.
- to provide opportunities for the professional growth of teachers
- to advance the standards of education.
- to address the needs of developing countries and communities. (Inaugural meeting of IACE SA; Wits University, Oct 1993).

The literature review (Chapter Two) gives an overview of these ideals and of the rationale underpinning the 'Teaching for Thinking' movement. Various approaches, programmes and methods in use in various parts of the world are discussed and their relevance evaluated for the local context.

1.3 'Thinking Actively in a Social Context' (TASC): A framework for school based curriculum development.

The TASC project was undertaken as a relevant, school based curriculum initiative that would promote inter-departmental contact between teachers. Chapter Three considers the pros and cons of school based curriculum development (SBCD) and argues that workshops based on TASC teaching principles (4.1.1 below) can further the professional development of teachers by exposing them to the theory of the Thinking Skills movement. Further, the

opportunities for teachers to put into **practice** new ideas and new **skills** in a collaborative and participatory way is described in the action research design chosen for the study.

1.4 The focus of the dissertation

The research investigation focuses specifically on teachers' responses to the TASC Workshops. It aims to assess whether the implementation of a Thinking Skills and Problem-Solving approach in the classroom by participants effected any significant changes in their practice with regards teaching (i.e. their own teaching methods) and learning (their pupils' responses).

1.5 The research design and methodology

1.5.1 Statement of the problem and reasons for the research

The curriculum in South Africa, and indeed all teaching and learning, has been adversely affected by the politics of apartheid in education (Nepi Curriculum Report, 1992; King and Van den Berg, 1990). As in many parts of the world, curricula tend to be content-loaded at the expense of understanding, and there is much rote-learning and passivity on the part of pupils with very little opportunity given for children to express themselves or to think for themselves (Ausubel, 1985; Tharp and Gallimore, 1988; Perkins, 1992). Much of what they hear has little relevance to their life experiences. Teachers often teach in the way they were taught so out-dated methods and attitudes are perpetuated. Wallace and

Adams warn:

Educators across the world should be very concerned that the obsolete educational purposes of yesterday are not being unthinkingly emulated and perpetuated for a world that will increasingly need quite different curricula, new basic skills, creative vision, courageous leadership and especially thinking and decision-making skills for a changing world. (1993: p4).

It was in response to this challenge and to the problems of what is described as the 'disabling curriculum' (2.4.2 below) that this research was undertaken. The reproductive effects of schooling continue to produce teachers who are 'locked into a traditional and conventional approach which makes significant learning improbable if not impossible' (Rogers, 1985: p122). Ways must be sought and opportunities provided to develop teachers' knowledge and professional expertise in order for teaching and learning to be more relevant in our rapidly changing times. The introduction of Thinking Skills in schools is in line with world-wide developments in cognitive psychology and educational research which stress the development of autonomous thinking abilities in all people (Baron and Sternberg, 1987; Maclure and Davies, 1991). By providing the opportunities as described in this study for teachers to develop their professional knowledge and to reflect on their own practice in the workshop situation they would be able to:

share experiences and problems and to collaborate in their own growth as they attempt alternative ways of teaching. (Walker, 1990: p62).

1.5.2 The research hypothesis

If interest in critical and creative thinking were stimulated and the adoption of a problem-solving approach was modelled at the Workshops using participatory methods and active

learning experiences, teachers' confidence, self esteem and practical knowledge would gradually be enhanced. With the additional opportunity to trial methods and materials in the classroom in the presence of the facilitator/researcher who would provide opportunities for reflection and feedback, a cyclical process of critical self reflection would be set in motion. Should this process result in effective changes in teachers' practice, it might then be possible to demonstrate a series of steps through which teachers can be led in order to contribute to curriculum development. These findings, although limited in scope and not necessarily generalisable, reflect the potential of teachers to become agents of change. These findings could then be added to the body of research as 'grounded theory' to inform those responsible for teacher-training and educational reform on the local level.

1.5.3 Choice of qualitative methods

Chapter Three contains a description of the research design and methodology. A qualitative approach was chosen because of the nature of the project which aimed at working with teachers in a collaborative, participatory way over a nine month period. The study investigated teachers' responses and perceptions to the curriculum innovation which would inevitably be subjective and influenced by individual values and interests (Mouton, 1988). Quantitative methods were not considered suitable for these reasons. The researcher sought to gain an understanding of her subjects' worlds and accurately portray their responses to a dynamic, interactive process.

1.5.4 Action research / case study approach

An action research / case study approach was deemed most suitable as the process involved the 'cycles of spirals' of planning, implementing, rethinking, reflecting, discussing, learning, understanding and replanning described in various curriculum development models (Kemmis and McTaggart, 1981; Elliott, 1981 and Ebbutt, 1983 cited in Hopkins, 1985; McNiff, 1988 and Davidoff and Van den Berg, 1990; Marsh and Stafford, 1988).

Flexibility was felt to be an important requirement in the choice of design and method.

The sites and subjects for the case studies were predetermined by the Network Committee's arrangements for the TASC project (3.3.3. below). Eighteen teachers from five local primary schools in the Pietermaritzburg area participated. The schools, for the purposes of the case study are referred to as A, B, C, D and E and represent each of the former education Departments in KwaZulu-Natal (3.3.3.1).

1.5.5 Techniques for data collection

The limitations of an action research approach are also discussed in Chapter Three. The researcher acknowledges the possibility of bias in interpreting the data, being aware of her own subjectivity as a participant in the action research process (Carr and Kemmis, 1986).

The techniques used for collection of data are described in detail in Chapter Three and included focused group discussion, participant observation, the use of a questionnaire and interviews (unstructured and semi-structured).

1.5.6 Analysis of data

Data was analyzed concurrently with the events of the project: each step of each action research cycle necessitated interpreting observations, actions and responses of participants in order to adapt and plan the next step.

1.6 The TASC project: analysis of impressions and interpretation

Chapter Four describes the events and interactions that took place during the TASC curriculum initiative. The four phases are summarised in a 'forward planner' (see 4.2 below) which outlines the sequence of Workshops and school visits, as well as the dates and times of all contacts and interactions with subjects in the study. The action - research design as a whole is analyzed from the points of view of both the researcher and the subjects (see diagrams at end of 4.8.6) in a series of cycles and spirals describing the process of the study.

A comparison grid highlights differences in subjects' perceptions of problems in education, and was useful in assessing the needs and understanding the specific context of each site at the start of the planning stage. The teachers' recorded responses to the

of the aims and assumptions of TASC in order to produce a practical assessment of the following:

- whether teachers had made sense of the theoretical underpinnings of the TASC Thinking Skills framework as presented at the Workshops
- whether teachers had been equipped and empowered to implement the Thinking Skills by the experiential, group- work approach and collaborative sharing adopted at the Workshops
- whether the introduction of the TASC approach (Thinking Skills and methodology) had resulted in positive changes in their pupils as measured against TASC's aims for the pupil
- whether they themselves had grown professionally in terms of self-confidence and their perception of themselves as change-agents
- whether there was carry-over on a whole-school basis of the curriculum initiative and to what extent the contexts and principals' roles aided or limited this.

The case study grids present graphically the time-frame and the amount of contact and interaction between the researcher and each school. Thus it can be seen at a glance how much input was received by teachers at each site. These, together with the responses analyzed after each contact, show the relationship between input (in terms of time and energy) and the changes with regard to practice.

1.7 Recommendations and limitations of the study

Conclusions and recommendations are described in Chapter 5. The researcher tries to assess the extent to which a programme of Workshops and school visits of this nature empowers teachers to play a role in curriculum development leading to more effective teaching and learning in schools. The limitations of the study in achieving these ends are acknowledged. The TASC theoretical framework presented in an action research way, is considered as a viable model for further local school based curriculum initiatives, fulfilling as it does, many of the recommendations made by Mathfield (1992) for introducing a skills-based/cognitive approach into the primary school curriculum. This proposed model could be used for in-service training of teachers across a broad spectrum of educational institutions:

Experiential, co-operative learning situations should be provided in an attempt to equip teachers through experience to operate within the paradigm under discussion. (Mathfield, 1992: p119).

1.8 Conclusion

The 'paradigm under discussion' is that of the 'Teaching for Thinking' movement which accommodates the teaching/learning of Thinking Skills within the school curriculum. The background to this significant development in educational and psychological research is given in the following chapter. A rationale for the teaching of Thinking Skills and problem-solving is offered against a background of the many disabling features of teaching and learning evidenced in our schools. Exposing teachers to Thinking Skills and problem-solving procedures is considered as a means of effecting meaningful change towards a

more enabling curriculum, largely because the approach requires a change from traditional teaching methods. The various programmes, approaches and methods available within this paradigm will be discussed.

CHAPTER 2**REVIEW OF RELATED LITERATURE AND SIGNIFICANT CONCEPTS IN
THE RESEARCH****2.1 Introduction**

This review of the literature relevant to the research investigation gives an overview of the developments in the teaching of Thinking Skills and a general grasp of the field of cognitive education to date. The purpose is to sketch briefly how and to what extent educators in other parts of the world and in South Africa are including Thinking Skills programmes in schools, and so to locate this study within the general context of what has become known as the concept of 'the thinking curriculum' (Nisbet, 1993: p281). What is meant by 'thinking' and why thinking should be taught, are two aspects that are discussed.

Some existing problems in education (referred to as the 'disabling curriculum') will be discussed in order to justify the teaching of Thinking Skills in schools. One has to analyze the current situation in education, e.g. Perkins (1992), Davidoff and van den Berg (1990), Wallace and Adams (1993), in order to make tentative suggestions for change towards a more 'enabling curriculum'. Some principles from which insights into better teaching and learning can be gained are considered. The TASC (Thinking Actively in a Social Context) model of Wallace and Adams (1993), which is the focus of the practical part of this research study, is suggested as a framework within which teachers can work to develop their professional knowledge and their practice.

Different methods and approaches related to Thinking Skills programmes will be reviewed and examples given of each approach. These fall into three categories: the **adjunct**, or 'add-on' approach; the **infusion** method; and the **integrated** approach or 'mixed model' for the teaching of **thinking**.

Certain terminology, concepts and constructs central to the study will be clarified according to the researcher's understanding of their relevance to the research.

2.2 The Thinking Skills movement

The question whether administrators in education, and teachers generally, are aware of the increasing body of research concerning the importance of the teaching of **thinking**, is posed by Robert Sternberg in "Questions and Answers about the Nature and Teaching of Thinking Skills" (Baron and Sternberg, 1987). It is raised here to introduce the topic in this review of the literature because it serves to alert one to two important ideas in this study - **newness** and **change**. It is these two aspects of the curriculum initiative under discussion that the teachers are being asked to respond to in this research project.

But is **thinking** in schools new? The historical roots of the teaching of **thinking** can be traced throughout history, from Plato and Socrates to modern day protagonists. Overviews of the teaching of **thinking** are given by Mathfield (1992: p1), Edwards and Baldauf (1987 in Perkins, Lochhead and Bishop, p454) and many others. No-one in education would deny that one of the main aims of teaching is, and always has been, to encourage good **thinking** habits in the learner - to teach pupils to think for themselves - and not to simply fill the

minds of students with factual information. Coles reminds readers of Dewey's comments as far back as 1916 when he quotes:

No one doubts, theoretically, the importance of fostering in school, good habits of thinking. But, apart from the fact that the acknowledgement is not so great in practice as in theory, there is not adequate theoretical recognition that all which the school can or need do for pupils, so far as their minds are concerned ... is to develop their ability to think. (1993: p33).

It is necessary, however, to consider both **theory** and **practice** in order to identify the discrepancies that exist and to inform future approaches. The idea of teaching thinking is **not** new, but it is generally recognised that there has been an explosion of interest in recent years (Coles, 1993; Nisbet, 1993; Adams, 1989: p25; Sternberg in Baron and Sternberg, 1987). The 'inadequate theoretical recognition' mentioned by Dewey in 1916 has been increasingly addressed by theorists in educational psychology, philosophy and sociology throughout this century.

Among the many reasons for present-day interest in the teaching of thinking is the need for educators to respond to a rapidly changing society. The 'progressive education movement' (Nisbet, 1993: p282), the 'educational reform movement' and the emphasis on 'information processing skills' (Mathfield, 1992: p11) have all been a response to the rapid changes that the world is undergoing. The need to adapt and change schooling to meet these profound challenges is being focused on in many parts of the world (Maclure and Davies, eds, 1991: p206-207; McTighe and Schollenberger in Costa, 1985; Nickerson, Perkins and Smith, 1985: p4). The urgency to improve our knowledge about thinking and

our application of this knowledge in learning situations is reflected in most overviews of the literature on the teaching of thinking.

Increasingly, educational reform is being addressed in curriculum initiatives stressing cognitive aspects, such as 'the process approach' (Mathfield, 1992: p9), the 'problem-solving approach' (Fisher, 1987) and 'critical thinking' (Ennis, 1987). Large-scale efforts such as those in Israel (Feuerstein, 1980) and Venezuela (Buscaglia, 1987 in Perkins, Lochhead and Bishop p141) have all been informed by modern theories of cognition in response to the 'rapid-change' syndrome of the 'information age' - with its increasing explosion of available knowledge. Examples of countries in Europe and North America, particularly, which have introduced the teaching of thinking - together with a review of programmes - are detailed in the Secretariat's Background Report on the 1989 OECD Conference organised by the Centre for Educational Research and Innovation (Maclure and Davies, 1991).

2.2.1 What is this 'new' kind of thinking that we need in schools?

How 'thinking' is defined will depend on whether one views it from a philosophical, psychological, sociological, political or scientific perspective. No attempt will be made here to define the term specifically. Writers such as Ennis (1985) and Paul (1984) focus on critical thinking, while Torrance (1976) and Perkins (1985), for example, emphasise the teaching of creative thinking in order to develop intellectual potential.

It is evident from the literature that certain **basic thinking skills** are deemed necessary for children and adults to cope with the increased demands of modern democratic societies. These are described by Wallace and Adams (1993) in four categories, namely : **Knowledge, Attitudes and Motivation, Metacognition and Skills and Processes**. Like many other writers in the field, they emphasize the explicit promotion of the thinking process - the disposition or inclination to think effectively - rather than the solution of problems themselves. Sanchez describes thinking as based on 'mental operations that, once internalised, can be applied as instruments, strategies, or tools in problem-solving, decision making and learning'. (1987: p413).

De Bono's CoRT Programme teaches 'thinking tools' designed to cover the creative, the constructive and the critical aspects of thinking (de Bono, 1991). In the TASC model (Wallace and Adams, 1993) thinking strategies are referred to as **Tools for Effective Thinking**. In both these programmes it is the appropriate selection and effective monitoring of the choice of thinking tool for a particular problem that is important. When acquired skills are internalised to the extent that they become 'automatised,' and used in novel situations different from the ones in which they were learned, transfer is said to have taken place. (Perkins and Salomon, 1989). This, together with metacognition, is one of the most crucial aspects in the teaching of thinking. No matter how much the emphases on various aspects of thinking differ, however, there is general consensus as to the value of teaching thinking. In emerging democratic societies such as our own, teaching people to become critical thinkers will become increasingly important as a goal in education.

In South Africa, faced with the crisis in education, there is a growing demand for the teaching of critical thinking (Nepi Curriculum Report, 1992: p7). For the purpose of this dissertation where the emphasis is on a cross-curricular approach in the primary school, the three aspects that will be considered are: creative thinking, critical thinking and problem-solving.

2.2.2 Creative thinking

'Creative Thinking' is thinking patterned in a way that tends to lead to creative results' (Perkins, 1985). Young children should be given opportunities to become 'creative producers'. Perkins goes on to say that 'thinking is an interesting mix of strategies, skills and attitudinal factors,' which are not encouraged in most classrooms. In fact he notes that 'schooling in general works against the creative pattern of thinking' (Perkins, 1985: p60).

When teaching for creativity De Bono (1976) places the emphasis on encouraging young children to think more widely and adventurously. They learn to consider alternatives, look at the same situation in different ways, extend options and explore ideas for their own sake, purely for the enjoyment of playing with possibilities. Barbara Z. Presseisen put it this way:

Creative thinking is using basic thinking processes to develop or invent novel, aesthetic, constructive ideas or products, related to percepts as well as concepts, and stressing the intuitive aspects of thinking as much as the rational. (1985: p43).

Brainstorming and **making Mindmaps** (Wallace and Adams, 1993) are two tools for creative thinking which primary school children can practise when they are required to generate a large number of new and unusual ideas or solutions for a given problem.

2.2.3 Critical Thinking

Critical thinking is usually defined as the use of basic thought processes to analyze arguments and generate insight into particular meanings and interpretations, or as

Presseisen says:

to develop cohesive, logical reasoning patterns and understand assumptions and biases underlying particular positions. (1985: p45).

Critical thinking, according to Ennis, can also be defined as:

reasonable, reflective thinking that is focused on deciding what to believe or do. (1985: p54).

The ability to think critically should, therefore, be considered a 'life-skill' in teaching for democratic citizenship as all choices, decisions and actions are affected by it. Teachers, according to Ennis, should 'try to get students to define terms, be specific about actions, make precise comparisons, and use accurate descriptors' if they are to encourage careful thinking. In a Thinking Skills model such as TASC (Wallace and Adams, 1993), these aspects are termed **basic thinking skills**, while Feuerstein (1980) lists them as cognitive functions occurring in either the 'input', 'elaboration' or 'output' phase of the mental act.

However, it is well to bear in mind that 'we cannot expect to teach critical thinking in an uncritical way'. (Riding and Powell, 1993: p222). These authors argue that students cannot be expected to become critically aware when no critical awareness is modelled by the teacher or in the course being taught.

Lipman et al, in the Philosophy for Children course, try to cultivate both creative and critical thinking in children:

Logical thinking can be encouraged by means of creative activity, and conversely, creativity can be fostered with the development of logical ability. (1980: p79).

The notion of critical thinking is endorsed by Richard Paul who also views it from a philosophical perspective. He advocates giving children the opportunity in school:

to reflect upon questions in mutually supportive dialogical settings. (1987: p129).

This indicates a special kind of learning environment or climate in the classroom when one is teaching for thinking. Swartz (1987) suggests that teachers who have a good understanding of the rationale behind the 'teaching for thinking movement' can decide for themselves, according to their subject domains, 'what skills, competencies, attitudes, dispositions and activities go into making good critical thinking'. He maintains that classroom instruction can be restructured by creative teachers to teach thinking skills by infusing them into the subject matter.

2.2.4 Problem solving

History demonstrates that human survival and progress is a matter of how well we cope with, and adapt to and control a changing environment. It is argued therefore, that problem solving has an important role to play in providing children with similar challenges and opportunities in schools (Fisher, 1987: p14). Problem-solving activities nurture curiosity, develop confidence in making decisions and provide practice in using children's basic knowledge concepts and skills in practical and relevant tasks. Wallace and Adams (1993) argue for a curriculum that is relevant, building in learners confidence and abilities to face real world situations. In their TASC (Thinking Actively in a Social Context) framework, a problem-solving model is included. This can be adapted by teachers to suit the age and requirements of the learners.

Teaching the language of thinking is an important aspect for elementary school children (Costa & Marzano, 1987). By teachers modelling thinking through the language they use in the classroom, the thinking of their pupils can be enhanced. This can take the form of 'thinking out loud' or describing the thinking processes that allow one to take charge of the world for oneself. Encouraging children to think through and reflect on their thinking processes, is referred to by Whimbey (1985) as 'talk aloud problem-solving'. If according to Popper 'all organisms are constantly day and night engaged in problem-solving all organisms are constantly day and night engaged in problem-solving then schools should help children with this (1972: p42)'. Many practical problem-solving projects embarked upon by classroom teachers and which serve as examples, are described by Fisher. (1987: p16-20). Problem-posing and learning to ask the right questions are as important as

generating solutions and should be explicitly taught as one of the steps in the problem-solving process. This is reiterated by Williams & Sternberg (1993) who include this aspect of thinking as one of the seven most essential lessons to teach in order for a child to reach his/her full potential.

2.3 Why teach thinking?

Having considered briefly the nature of creative and critical thinking and problem-solving, we need to ask the following:

- why thinking should be taught
- why there is an emphasis on cognitive skills in education
- and whether thinking can in fact be taught at all.

In order to address these thoughts, it is important to consider some of the modern psychological theories about the nature of intelligence and learning which inform the 'teaching for thinking' movement. Where there is scepticism about whether thinking can be taught, it is usually because of the underlying perspective adopted on these two issues.

2.3.1 Approaches to the nature of intelligence

A clear appraisal of how people in various disciplines have viewed intelligence is given by Sternberg in his book 'Metaphors of Mind' (1990). This work also gives an historical overview of theories of intelligence and how they are informed by underlying 'metaphors'.

The main shift in emphasis seems to be from the view of intelligence as something static (as evidenced in the psychometric paradigm that has dominated education for most of this century) (Wallace and Adams: p19) to the more recent information-processing theories that see thought as the result of multiple intelligences, and learning as dynamic processes, strategies and problem-solving abilities that can be taught and improved throughout life. Wallace and Adams emphasise a 'developmental theory of intelligence' that is 'related to real life and that deliberately and consciously embraces the concept that all human life is growing and progressing':

All learners can become more able learners; the capacity for thinking is not static and unchangeable. (1993: p22).

This view is congruent with that of Feuerstein (1980) who argues that the 'human organism is open to modifiability at all ages and stages of development'. He believes that changes in intelligence are both possible and desirable.

Piaget was sceptical about the teaching of intelligence because he believed that functions and competencies emerge at certain ages and in a fixed sequence. Sociological theorists would be critical of Piaget's view that intelligence moves 'from the inside outwards' (Sternberg, 1990) and that we first learn what needs to be done by and for ourselves, and that we later externalize it. This is not to deny, however, the strong influence of Piaget's theories on the curriculum in providing a more child-centred approach, discovery methods and active learning through experiences provided in the classroom. The constructivist approach to maths is currently influencing mathematics teaching in South African schools where the processes and self discovery on the part of the learner are more important than the direct instruction of set algorithmic steps.

Vygotsky argues contrary to Piaget's theory. He suggests that we learn first from seeing what other people do, usually in social settings, and then internalize it. Both Vygotsky and Feuerstein emphasize the role of socialization processes in the development of thinking. (Sternberg, 1990: pxv).

It is significant in this review, therefore that we understand the theories of cognitive development that lead to the view that intelligence (and therefore thinking) can be improved, because it is exactly these protagonists who are actively involved in developing programmes for the teaching of Thinking Skills. Sternberg (1990), Wallace and Adams (1993) and Howard Gardner (1983) provide alternatives to the static theories emanating from the psychometric paradigm. What people mean by intelligence and intelligent behaviour is very important in any discussion of the teaching of thinking. There seems to be a core of factors that are common in the literature covering different approaches to our understanding of intelligence, and it is on these common factors that this study focuses. The common core factors according to Sternberg et al (1981) include:

- some kind of problem-solving factor
- some kind of verbal ability factor and
- some kind of social competence and a strong motivational component.

2.3.2 Recent theories about learning

Following on from a discussion of intelligence, it is relevant to look at theories of learning and how they are related to the teaching of Thinking Skills in the curriculum. Views of learning have changed from those of the behaviourists who argue that when certain

environmental conditions occur, learning will take place independently of any conscious, human involvement (Ashman and Conway, 1993: p33) - to those describing learning in terms of the thought processes that occur within our brains. This latter view takes more account of the role of the learner in the educational process and has become known as the cognitive or information-processing approach to learning.

Wallace and Adams acknowledge the influence of Borkowski's theory of intelligence and the key issue of metacognition in learners' thinking (Borkowski, 1985), as well as Sternberg's development of strategies for 'learning how to learn' and synthesise the position thus:

One can begin to find a coalescence of theory from which to derive new concepts of how children and adults best learn and therefore how educators should teach in order to bring about more efficient learning. (1993: p22).

Important concepts in modern theories of learning relevant to Thinking Skills programmes are:

- Metacognition (Flavell, 1979; Borkowski, 1985)
- Strategy Instruction (Muthukrishna and Borkowski, 1990)
- Self-regulated Learning and Motivation (Zimmerman and Schunk, 1989)
- Modelling (Bandura, 1977)
- Transfer (Perkins and Salomon, 1988) and
- Mediation (Feuerstein, 1980; Vygotsky 1978)

2.3.2.1 Metacognition

An understanding of metacognitive processes is becoming increasingly important in teaching and learning. These are 'the self-monitoring processes that learners need to acquire if they are to become autonomous and independent learners, able to reflect upon, take control of and manage their own lives and learning more efficiently' (Wallace and Adams, 1993: p26). Metacognition can be described as the deliberate and conscious control of one's own thoughts and actions. Washington quotes Flavell's definition of metacognition as 'one's knowledge concerning one's own cognitive processes and products or anything related to them.' (1987: p24).

Mathfield (1992: p11) describes it as 'deliberate reflection on the steps involved in a given cognitive strategy'. He stresses this as a vital component of the learning process and deserving of specific consideration in the design of Thinking Skills programmes. Metacognitive awareness, according to most writers on the subject, should be stressed in any problem-solving activity and progress towards a goal should be monitored. Bondy (1987) refers to metacognition as 'thinking about thinking' and maintains that providing children with metacognitive strategies would be of more value than factual information and content in a rapidly changing world. This is a significant issue in this dissertation as it implies that educators need to change the emphasis on content in their teaching to emphasis on the process of learning.

2.3.2.2 Strategy instruction

Research shows that the direct, explicit teaching of thinking strategies such as rehearsal, organisation, paraphrasing and summarising helps to develop 'active learners, involved in meaningful, planful and reflective processing' (Muthukrishna and Borkowski, 1990). It is suggested that this involves the use of feedback, modelling and teacher-guided student practice where teachers help the learners to generalise the strategies to new situations.

2.3.2.3 Self-regulated learning

Theories of self-regulated learning are discussed in Zimmerman and Schunk (1989). Zimmerman describes students as 'self-regulated' according to the degree that they are 'metacognitively, motivationally and behaviourally active participants in their own learning process' (1989: p4). It is important in any Thinking Skills programme that pupils believe that learning is not something that happens to them, but something that happens by them. It is suggested that students must become actively engaged at all levels, both covert and overt, for learning to take place.

Pupils learn best when they can select their own environments, and set their own goals and standards for self-evaluation.

2.3.2.4 Modelling

The modelling of thinking behaviour by the teacher is a powerful way of influencing learning (Wallace and Adams, 1993: p23; Costa and Marzano, 1987; Gallimore and Tharp, 1991). Bandura (1971) stresses this aspect (the teacher's modelling) as well as the importance of the learner's belief in himself (self-efficacy) and having a positive self concept as important factors in the learning process. The teacher, as model, provides the learner with vital information which he/she can internalise. (The negative impact of poor or misdirected modelling is also significant in the classroom).

2.3.2.5 Transfer

Sternberg (in Baron and Sternberg, 1987: p258) and Adams (1989) suggest that transfer is the fundamental issue or primary goal, in the teaching of thinking. Adams states that:

if the processes don't transfer, they cannot even be called thinking. (1989: p30).

Salomon and Perkins (1989) describe transfer as 'the extent that a new circumstance calls on a complex of procedures overlapping a complex that was previously well exercised'. Perkins (1992) describes it as 'learning something in one situation and then applying it in another, significantly different one'. Strategies for maximising transfer in thinking skills programmes are suggested by Sternberg (1987) and Perkins and Salomon (1988: p22-32).

2.3.2.6 Mediation

Social interaction in any learning situation is considered to be crucial according to Vygotsky (Bruner, 1985) and Feuerstein (1980). An understanding of the world is not developed from experience alone, but from the quality of interaction and verbalization between a learner and a mediator, be it parent, teacher or more capable peer. Thus the ideas of peer-group interaction, collaborative learning and mediation must be fundamental concepts in the methodology of any Thinking Skills programme. The social context in which learning takes place is also of prime importance:

All learning needs to be embedded in a context that is culturally relevant and which takes cognizance of cultural values, expectations, norms, experiences and customs (Wallace and Adams, 1993).

2.3.3 Summary of reasons for teaching thinking

A consideration of the above concepts is necessary in order to view thinking skills programmes against the theoretical background of our knowledge about how children best think and learn. To answer the question 'Why teach thinking?' and to justify the teaching of thinking in the school curriculum, the following points will serve as a summary.

Firstly, society is changing so fast that we need to bring teaching in line with modern theories of cognitive development and learning in order to equip pupils with the skills to be able to adapt to and cope with its ever-increasing demands. Children's ability to become independent learners and autonomous thinkers must be developed.

Secondly, we now have the tools with which to teach thinking. These have been developed as practical techniques in a whole range of programmes based on modern theories of intellectual growth. Nickerson's reasons for teaching children to think, (in Baron and Sternberg, 1987) are more philosophical and extend far beyond the classroom. He claims that being a good thinker makes one more successful and makes one a better citizen. In addition, he adds that 'in a democracy, citizens have an obligation to think deeply about significant issues' and suggests that being a competent thinker contributes to one's psychological well-being. The final reason Nickerson gives for teaching thinking is as follows:

because thinking is at the heart of what it means to be human
- and to fail to develop one's potential (in this area) is to
preclude the full expression of one's humanity. (1987: p31).

The TASC (Thinking Actively in a Social Context) model (Wallace and Adams, 1993) derives from a synthesis of the afore-mentioned theories of intelligence and learning and is used as the framework for the introduction of Thinking Skills in a local curriculum development initiative which is the focus of this study.

2.4 The South African context

In the South African context where the majority of children have been educationally disadvantaged by the apartheid system (Skuy, Mentis, Nkwe, Arnott and Hickson, 1990), the teaching of Thinking Skills provides a means of redressing some of the most urgent problems in education. There is an obvious need to release latent potential and to empower previously disempowered learners (Botha & Cilliers, 1993). Any curriculum initiative

must aim to improve cognitive functioning if more independent and efficient thinking is to be fostered (De Bono, 1976; Costa, 1985; Nickerson, et al, 1985). This need is emphasised when learners are required to learn in their second language. Curriculum development programmes which combine the teaching of thinking skills and language - or include thinking skills in the L2 curriculum, are supported by Puhl, (1991) and Botha and Cilliers (1993). Research on the effectiveness of these and of the TASC Project, may contribute in some measure to improvements in both learning and teaching in our schools.

2.4.1 Changing views of teaching

Having looked at the various arguments in the literature as to why thinking should be taught, and at the ways in which our knowledge of how children learn has developed, we can complete the picture which sketches the background to this study by looking at new perspectives about methodology. Firstly, characteristics of 'traditional teaching' and the 'traditional school' (Davidoff and van den Berg, 1990: p24-25) will be described. This scenario becomes part of 'the research problem' and what is termed 'the disabling curriculum'. Thereafter, the kinds of changes necessary for more 'progressive' teaching to occur, will be considered (Bennett, in Davidoff and van den Berg, 1990). Such changes are the goal of the TASC project, which, however small, could lead to a more 'enabling curriculum' in this country.

2.4.2 The disabling curriculum : methodology

Noticeable changes in educational practice are hard to identify because classrooms and schooling around the world seem to have stayed very much the same over a long period of time. Despite new knowledge about intelligence, learning and teaching, classrooms remain disabling environments for most pupils, and teachers continue to teach in the way that they were taught.

2.4.2.1 Memorisation and rote-learning: The teacher as dispenser of knowledge

Schrag (1987) documents the 'prevalence and stability' of certain dominant teacher behaviours that have become known as the 'recitation script'. Teaching, despite recent psychological and educational theories, has changed little over the last century in this respect (Adams, 1994 in press). Hoekter and Ahlbrand (1969) quoted in Schrag, found that teachers talked between two thirds and three quarters of the time and this major activity was asking and reacting to questions that called for factual answers from students.

David Perkins emphasizes how little we see of 'sound methods' in the classroom, suggesting that teachers easily follow the 'trivial pursuit' model of teaching without realising it:

A doggedly knowledge-orientated approach has become especially plain only in light of recent research in cognitive science. (1992: p31).

Adams confirms that little has changed over the years by documenting the evidence of the 'recitation' as contrasted with the socratic pattern of verbal interaction in the majority of classrooms around the world:

Schooling is an end in itself, imparting all the knowledge (and occasionally skills) that the learner is ever going to need. The teacher must know all the answers; no enquiry or use of references is encouraged. Pupils cannot know anything about a topic until it has been taught in school, i.e. everyday experiences do not count. Activity is non-collaborative; pupils are passive and have the expectation of having something done to them...(1994 in press).

Gallimore and Tharp suggest that this is very much the order of the day in many classrooms of the world and 'the predominant experience of most American school children' (1990: p175).

Bruner (1966) argued that we should teach a subject, not to produce 'little living libraries' on that subject, but rather to 'get a student to think' and to take part in the process of thinking.

2.4.2.2 Pupil passivity

Descriptions of children as passive learners, with little interaction between them and the teachers are well documented in educational research (Goodlad, 1984; Tharp and Gallimore, 1988 and Bennett in Davidoff and van den Berg, 1990). In South African schools where the majority of children are learning in a second language there is much rote learning on the part of pupils (Mossom 1989), with little opportunity for pupils to play an

active role. With the lack of resources such as libraries and laboratories, teachers cannot easily employ discovery techniques.

2.4.2.3 No integration of subject matter: lack of 'scaffolding' / lack of relevance

Wallace and Adams (1993) question 'whether teachers always understand the conceptual maps they are mediating; whether they have a clear conception of the primary and subsequent levels of conceptualisation within the subject area they are teaching.' If there is inadequate 'scaffolding' provided by the teacher, the higher level concepts cannot be understood, leading to confusion and demotivation on the part of the learners. Where the emphasis is on separate subject matter and not on holistically planned, integrated content, learning may well become a meaningless exercise. This is particularly the case if the subject matter has no connection with the lived experiences of the children. Where material is not presented in a meaningful context or way, Ausubel (1985) points out that rote learning by constant rehearsal is the only sensible way to cope.

Much has been learned about teaching and learning from the socio-historic theory of Vygotsky. His notion of the 'zone of proximal development' is a key concept which is defined as:

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

This is significant when considering the lack of social interaction in most classrooms and the irrelevance of much that is being taught.

Hedegaard in Moll (1990) describes the importance of Vygotsky's notion of the zone of proximal development as a basis for instruction:

The teacher's role is to direct action within school activity in a manner appropriate to the child's present level of development, the cultural and social context, and the teacher's theories of what central subject matter is. (p350).

Gallimore and Tharp emphasise in their definition of teaching that:

teaching can be said to occur when assistance is offered at points in the zpd at which performance requires assistance. (1988: p41).

2.4.2.4 Competitive classroom climate / little co-operative learning

Davidoff and van den Berg (1990) note how most South African schools 'encourage competition and individualistic behaviour rather than co-operation and collective activity'.

Yet the enhancement of learning through group work and collaborative learning with one's peers is well documented in educational research (Slavin, 1980; Barnes and Todd, 1977; Johnson and Johnson, 1987) Schmuck and Schmuck comments as follows:

Many classrooms are constrained environments where students do not feel free to touch one another psychologically; empathy is almost non-existent and the teacher does over 80% of the talking. Students who know what is expected of them and who are involved and close to their peers in pursuing educational goals are more satisfied than students in traditional classrooms. (1988: p31).

Perkins (1992) claims that there is a notion in education of **ability** influencing achievement rather than acknowledging the place of **effort**. This works against one of the important tenets of more 'progressive' teaching and 'person-centred' learning highlighted by Davidoff and van den Berg (1990: p25-26) and based on Bennett's and Carl Rogers' theories.

2.4.2.5 Teachers do not encourage independent thinking

The prevalence of a non-favourable atmosphere in classrooms emphasising the reproduction of existing knowledge would have strongly negative effects on both the cognitive development of children and the development of independence and autonomous thinking and self esteem. This is the case particularly in our country where the effects of the policy of separate education departments based on race have been markedly disabling (Skuy, Mentis, Nkwe, Arnott and Hickson, 1990; Christie, 1993). What is documented by Isaksen as happening in Brazil, cited in Alencar (1993), parallels the situation in South Africa: that schools appear to be spending most time, energy and resources to provide for low level thinking and recall through lecture and recitation methodology only. Further research which analysed text books found that most exercises and questions require reproduction of information rather than a search for new information, the use of imagination, divergent thinking or the application of higher level cognitive processes.

The educational setting in most schools is characterised by obedience and passivity and the prevalence of the traditional view of teaching with its emphasis on the transmission of knowledge and assimilation of the information by the students. Many educational settings

do not pay attention to affect and motivation, cultivating in learners characteristics of independence, self confidence, persistence and flexibility. These and other characteristics such as courage to express divergent ideas and points of view are not reinforced in the classroom and one can assume that techniques and methods for producing new ideas and higher order thinking are not amongst the repertoire of skills of most classroom teachers.

2.4.2.6 Examinations-driven system of education

Mossom (1989) documents the reliance on rote-memorisation of facts in primary schools in this country for the purposes of passing examinations. Over emphasis of norm-referenced evaluation (within formal exam and control test systems) tends, due to the 'washback effect', to influence teachers to rely on the "safety" of content-based teaching (Stenhouse, 1975). In South Africa, because assessment policies are centrally prescribed there is a tendency towards teacher-centredness, convergent questioning and formal classroom arrangement (Orpen, 1987).

King and van den Berg suggest that what happens in schools is thus largely driven by the exam system:

One of the enduring criticisms of the South African school curriculum is that it is "too academic". The argument is that the universities dominate school curriculum development by majority membership of the Joint Matriculation Board, which in turn dominates the school-leaving examination and so has a pervasive impact on what happens within schools. (1991: p14).

2.4.2.7 Physical environment

Another disabling feature of the majority of schools in this country is the physical environment. In South Africa we have factors even more basic in the hierarchy of children's needs to the actual classroom setting that affect the quality of education. These are the physical and psychological conditions of many pupils who do not even have the basics of food, shelter and security. The learning climate in our country has been eroded by adverse social and political factors. Most educational structures that facilitate learning and teaching, such as parent and community involvement, have broken down and there is often little co-operation between home and school. The curriculum has been essentially non-participatory and undemocratic (King and Van Den Berg, 1991; Nepi Report, 1992; Christie, 1993). With the inequalities of apartheid schooling, the majority of classrooms lack even the most basic equipment and teaching aids. These factors all adversely affect the quality of teaching.

2.4.2.8 Poorly qualified teachers: lack of professional development

Research (Botha, 1986) cited in Botha & Cilliers, 1993, indicates that teaching practice in South Africa is often of a low standard because the majority of teachers are under-qualified. More than 80% of black teachers, according to this research, only have Std 8. Educationists in other parts of the world are not only viewing teachers' professional development as a career-long process (Holly and McLoughlin, 1989, cited in Kelchtermans and Vandenberghe, 1994), but also as a major factor in an effort to improve schools. By contrast, in South Africa, there is inadequate INSET and few opportunities for teachers to

upgrade their skills and qualifications. There must needs be an urgent thrust in this area in order to improve teachers' practice:

Any serious attempt to effect changes in the national curriculum requires a national programme of in-service support for teachers. (Nepi Curriculum Report, 1992).

This research study focuses on the professional development of teachers through training in Thinking Skills. Mathfield (1992: p114) argues that 'the teacher should be at the centre of curriculum development'. It has become increasingly recognised in the literature that teachers themselves, can be researchers and through involvement in school-based curriculum development contribute to our understanding of what needs to change in the classroom (Patterson, et al, eds, 1993; Stenhouse, 1975; Walker, 1990).

But for change to occur teachers will have to take on a new role: they themselves need to be 'competent and independent learners who have a personal and accessible repertoire of such skills' (Wallace, 1988). Nisbet (in Maclure and Davies, 1991) has this to say:

We cannot expect to teach thinking if the teachers themselves are not thinking. (p184).

A two way process seems to be emerging: the development of teachers' professional knowledge in order for them to contribute to curriculum development, and the introduction of teaching for thinking in the curriculum as justified in recent educational research (Nickerson, Perkins and Smith, 1985; Sternberg, 1985a; Adams, 1989; Nisbet, 1993; Wallace and Adams, 1993). Christie (1993) stresses the importance of the curriculum in developing forms of thinking and approaches to intellectual activity in the South African context of 'pervasive curriculum inequality.'

What this research aims to suggest is that there are frameworks for the teaching of Thinking Skills that can be drawn upon in order to develop teachers' professional knowledge and to improve teaching and learning. These can be adapted to the varying contexts in this country to meet the demands for a more democratic, participatory, relevant, **'thinking'** curriculum.

2.4.3 Summary of the disabling curriculum

In summary then, the 'disabling' curriculum encompasses the lack of concern for self-regulation in learners, the lack of promotion of individual autonomy as one of the roles of education (Enslin, 1994: p24) and the lack of conditions that favour learning i.e. very few classrooms that encourage enquiry/discovery learning in a collaborative, growth-promoting climate. According to Wallace and Adams, (1993) an 'inert' curriculum is one which is static and without the power of action; one which is overloaded with content, which encourages passivity and conformity, ignores individual differences and provides subject matter that is irrelevant to the learner. Teaching in South African schools is characterised by authoritarian attitudes to discipline, a reliance on textbooks, memorisation of factual information and a teacher-centred pedagogy (Orpen, 1987).

2.5 Pointers to change

From where, then, do we derive new principles for teaching?

Gallimore and Tharp suggest that:

if we are to build a theory of teaching, evidence must come from elsewhere than schools. The most effective teaching occurs in other settings of socialization. (1991).

Much can be learned about teaching and learning by observing for example, child-rearing situations or employees in training-situations that these authors call 'non-schooled' settings. It is from teaching-learning situations such as these, they argue, that principles for re-thinking education can be derived. Schrag corroborates this when claiming that the social structure in schools is not compatible with tasks that require genuine problem-solving (1987: p483). The two main reasons for this are that 'peer-collaboration' and 'the need to access more information than one can carry in one's head' are denied in most schools, either because of the problem of controlling large classes, or because of regimentation of time-tabling and restriction of movement. In other words, the way schools are organised, limiting pupils to a classroom base in which there is little social interaction, works against effective teaching and learning.

How then can teachers best learn to teach? How can we get away from the reproductive effects of schooling, or break the cycle of teachers teaching the way they were taught? If we know about more effective teaching-learning interaction, why doesn't teaching and why don't teachers change?

It is argued in the literature (Perkins, 1992: p13) that, given appropriate frameworks within which teachers can develop their professional knowledge, changes in pedagogy can occur. Specific techniques and methods (such as fostering metacognitive awareness, modelling and

mediation described in paragraph 2.3.2 above) are common to most Thinking Skills programmes. The adoption in the curriculum, therefore, of an appropriate 'thinking' approach with complementary methods, can lead to a change of role for the teacher and therefore better schools (Coles, 1993: p336; Botha and Cilliers, 1993; Nisbet, 1993; Wallace and Adams, 1993; Puhl, 1991: p31).

The two central concepts are thus teachers' notions about the curriculum and themselves as change-agents, and the inevitability of, and necessity for change, in the light of modern theories of teaching and learning and rapid advances in modern society.

Perkins, commenting on the need for wide-scale innovation in education, argues as follows:

A large part of the challenge rests in helping teachers to develop new knowledge and skills and helping educational institutions to change in fundamental ways that make room for thoughtful teaching and learning. (1992: p204).

It is appropriate at this point, therefore, to consider the range of programmes available for curriculum initiatives within the 'Thinking Skills' paradigm that could contribute to educational reform.

2.6 Programmes, methods and approaches

If the introduction of Thinking Skills into the curriculum is a means of improving teaching and learning as is argued in this study, then curriculum developers, administrators and teachers need to have some knowledge of available frameworks, programmes and

materials. The various approaches and methods should be understood and evaluated against relevant criteria (Sternberg, 1983) before a programme is selected for use in a school. By being aware of the advantages and disadvantages of the different programmes and their underlying assumptions, one is in a better position to evaluate and justify one's own preferred approach. Ideally, the practical implementation of any intellectual skills training programme should be theoretically justifiable and congruent with the aims for teachers, pupils and the curriculum of the particular educational setting in question. Let us now consider the three broad categories of Thinking Skills programmes available. Examples of programmes within an approach and comments on them will be given.

2.7 Approaches to the teaching of thinking

In the literature there are three possible approaches to the teaching of Thinking Skills:

- the adjunct / 'add-on' / 'general' or 'skills' approach, where Thinking Skills are taught as a separate subject in the curriculum
- the infusion or 'immersion' model, where the Thinking Skills are applied within subject domains, and
- the integrated approach, where the Thinking Skills are made explicit in their own right as well as being bridged into the various subjects in the curriculum. This 'mixed' model in a sense, is a combination of the adjunct and infusion approaches.

While approaches differ, the goals of curricula on thinking all aim at teaching processes, whether these be termed 'macrological' or 'micrological' (Paul, 1984). The emphasis remains on the teaching of thinking strategies regardless of whether the materials are

`content free' (abstract), in nature or of a more `subject specific' kind. There is also much commonality in the specific **methods** used to teach thinking despite controversial differences in **approaches** (Nisbet, 1993; Coles, 1993; Maclure, 1991). The goal of all these programmes is that the skills and processes **transfer** - i.e. that students are able to use skills taught in one form spontaneously in some other context or on some other occasion and/or in another form. (Salomon and Perkins, 1989; Adams, 1989; Maclure, 1991). The effectiveness of a programme is therefore often evaluated according to whether it achieves transfer or not.

2.7.1 The adjunct model

This involves the `direct' teaching of Thinking Skills in the belief that thinking can be improved. Various components of thinking that are considered useful in both school and in life are identified and then explicitly taught. Activities and exercises illustrating general strategies for thinking are taught independently of the subject matter being covered in the normal curriculum. As Maclure states:

Thinking (under one title or another) thus becomes a subject in its own right. (1991: pxi).

2.7.1.1 Project Odyssey

Adams (1989) agrees with this `skills approach' or `direct method' and argues that Thinking Skills instruction should be introduced as a course in itself as a valuable complement to conventional teaching. Adams bases her view on schema theory, arguing that spontaneous transfer cannot occur unless thinking is developed unambiguously as a

schema in its own right. Adams describes Project Intelligence or Odyssey as an example of the 'adjunct' approach. This is a project that was devised for the Republic of Venezuela at the request of their Minister of Education in conjunction with Harvard University and the Cambridge consulting firm of Bolt, Beranek and Newman. Its aim was to enhance thinking ability across the nation and thereby develop latent intellectual potential. It aims to teach mastery of specific skills such as observation, comparison, classification and ordering. The materials are of an abstract nature, involving information and interpretations - two basic components, irrespective of domain or subject area. The lessons aim to develop a set of processes, concepts, strategies and attitudes that support these two components. Mediated transfer is pursued as a primary goal with 'brute force' (Adams, 1989). An overview of Project Intelligence or Odyssey is given by Elena Wright (in Costa, 1985). The results of evaluation studies of Project Intelligence have been positive in terms of transfer of skills to problems quite different from those stressed in the course. (Adams, 1989; Nickerson, Perkins and Smith, 1985).

2.7.1.2 The CoRT programme

Perhaps the best known example of a skills approach is the CoRT method of Dr Edward de Bono. This course teaches a set of 'tools' or techniques that aim to increase effectiveness and flexibility of learners' thinking in solving problems, making decisions, considering priorities and alternatives and other life skills. It involves exercises in critical, analytical and creative (lateral) thinking and aims to produce 'operacy' - or the skill of 'doing' as opposed to 'knowing'. De Bono argues strongly in favour of his direct method

of teaching Thinking Skills as a separate subject in the curriculum, suggesting that traditional approaches do not transfer to real-life situations. He states that:

unless processes are made explicit, there is no retention of a skill. (de Bono, in Maclure and Davies, 1991).

He claims that the CoRT method is simple, practical and capable of being used by a large number of teachers of varying backgrounds, cultures and aptitudes. Other advantages claimed for his direct method are that it is applicable to students of different ages and abilities, emphasises perceptual thinking and transfer to 'real-life' situations. He claims that it is 'robust' and will remain intact when passed from trainer to trainer, and that its 'parallel' design allows for parts of the course to be used successfully, even if other parts are forgotten or misunderstood. He sees this as an advantage over courses with an 'hierarchical design'. An evaluation of the effects of the CoRT-1 Thinking Skills Programme by Edwards and Baldauf (in Perkins, Lochhead and Bishop, 1987) on senior primary children showed positive attitudes to the usefulness of the materials, and significant positive shifts in IQ, creativity, and self-concept of the learners. Other researchers remain sceptical, however, suggesting that more research needs to be done to substantiate these claims (Maclure & Davies, 1991).

In South Africa educationists, together with world leaders in the field of Thinking Skills teaching, have taken aspects of de Bono's 'tool method' and adapted it for various contexts. In some cases it has been used as a separate Thinking Skills course (Botha and Cilliers, 1993) while others have adapted it for infusion into the L2 curriculum (Puhl, 1991).

2.7.1.3 Instrumental Enrichment

The other well known 'direct-skills approach' programme is that of Feuerstein's 'Instrumental Enrichment' (Feuerstein et al, 1980). Based on his theories of Structural Cognitive Modifiability and Mediated Learning Experience (MLE) it comes closest according to Adams (1989: p35) to being described in the 'micrological', 'abstract' or 'content-free' category (adjunct approach). Feuerstein (1980) lists cognitive deficiencies which impair school performance in many learners. It is well to recognise that his programme was designed particularly for disadvantaged adolescents, differing very often culturally and linguistically from the dominant ethos of the Israeli education system (Sharron, 1987). Based on a theory of intelligence as something dynamic and on a theory of learning where the quality of the mediation of a teacher is crucial to the learners' progress, his intervention programme concentrates on addressing the cognitive dysfunctions that most appear to hamper school success.

This programme consists of a series of 'instruments' providing paper and pencil exercises for teaching skills such as organisation, categorisation, comparison, orientation, analysis and problem-solving. There is a great emphasis in the methodology on metacognition (made explicit in the teachers' manuals) and generalisation or 'bridging' to other subjects. Although this is the key to transfer in the I.E. programme (Adams, 1989), there are no specifically designed exercises to give practice in generalising the skills to other contexts. Suggestions for 'bridging' the skills across various subject domains and examples of real-life contexts for practice are, however, given in the teacher training manuals.

This researcher, while acknowledging the abstract, 'content-free' nature of the paper and pencil exercises which place the I.E. programme in the 'skills-approach' category, takes the view that the theory and methodology well-applied, lend themselves suitably to an integrated style of Thinking Skills programme. The instruments are intended to be used as practice in thinking exercises, as a vehicle for developing the language of thinking (acquired through activities and by the modelling of the mediator) and as springboards for generalisation of the skills and processes into the broader school curriculum, specific subject domains and 'real-life' situations. It was designed to be an additional course in the curriculum and where the programme is adopted with no bridging it would remain purely in the 'skills approach' category.

Instrumental Enrichment has been adapted on a fairly wide scale in South Africa for varying levels and institutions. These range from primary schools to tertiary technical and teacher-training institutions. I.E. has been used to supplement normal teaching in outreach programmes with primary schools in disadvantaged communities and with gifted adolescents (Cognitive Education Conference, December 1991: University of the Witwatersrand; Skuy, Mentis, Nkwe, Arnott and Hickson, 1990).

Because of similarities in the situation of the disadvantaged students in Israel for whom the I.E. intervention was devised, and the vast majority of South African students who do not achieve their full potential in the education system offered in this country, Feuerstein's influence in the devising of Thinking Skills programmes in South Africa has been very significant. The programme pays attention to the affective side of teaching for thinking : it encourages the disposition to use the skills in appropriate ways. This is embodied in the

'Just a minute - let me think' motto for restraining impulsivity and warning against unthoughtful behaviour. Intrinsic motivation is provided by the challenge present in the exercises themselves. This programme requires fairly intensive training on the part of instructors if it is to be used with impact in improving teaching and learning. The methodology (MLE) is sound and can improve practice. There is the danger, however, of over-reliance on the part of teachers on the exercises to improve cognitive functioning with little attention given to metacognition and transfer.

The Somerset Thinking Skills Programme (Blagg et al, 1988) and Oxfordshire County Council Programmes (1987) are also derived from Feuerstein's theory and Instrumental Enrichment materials and methodology, but have been adapted to the cultural and linguistic styles relevant to the United Kingdom. Francis Link (1991) outlines a broad framework of cognitive functions which underlie efficient thinking, learning and problem-solving based on Feuerstein's three phases of the mental act : input, elaboration and output.

Feuerstein's Instrumental Enrichment Programme has been more comprehensively evaluated than most programmes (Nickerson, Perkins and Smith, 1985; Maclure and Davies, 1991: p215) while Blagg's 1991 evaluation results, cited in Coles (1993: p342), led him to be most optimistic about the effects of teaching Thinking Skills.

In any decision to adopt a skills or direct approach to the teaching of thinking, there has, however, to be sound justification for it in terms, not only of its theory, content, socio-cultural and 'real-world' relevance, but in terms of its greatest disadvantage: the need for curriculum time in an already overcrowded curriculum (Sternberg, 1983).

Other examples of the adjunct approach to teaching thinking are the IDEAL programme of Bransford and Stein (1984) and 'Dimensions of Thinking' by Marzano et al (1988) cited in Maclure and Davies (1991).

2.7.2 The infusion model

This approach means embedding the teaching of thinking within the subjects as they are taught in the established curriculum. This appeals to many teachers, because it can be fitted into existing curriculum structures and it does not require any extra curriculum time. It does, however, mean radical changes in the presentation of materials and greater emphasis on thinking processes within specialist subject domains. This could be the adoption of a problem-solving approach to the existing knowledge base across the curriculum: for example teaching 'scientific thinking skills' in science, or teaching the skills of the historian in history rather than only the factual content. Methods would deliberately aim at improving reasoning, analysis, critical and creative thinking. The question here is whether the infusion model adopted would pay enough attention to the whole range of thinking across the curriculum when no set of ready-made tools is used. One might get infusion of Thinking Skills in language lessons if a programme like Lipman's 'Philosophy for Children' were chosen; or Thinking Skills through Logo in computer studies. But particular attention would have to be given to transfer as this does not occur automatically. One would also have to ask whether the infusion approach would:

give sufficient identity to the teaching of thinking for it to resist dilution by the pressures of a crowded syllabus.
(Coles: p339).

The main assumption in this approach is that the process of thinking is inseparable from content: i.e. that thinking is 'domain specific'. Whether the Thinking Skills are generalisable beyond the subject boundaries in which they occur is much contested. There are many expositions of this debate in the literature (Cofes, 1993: p338-339; Sternberg; Baron and Sternberg, 1987: p254-255; Perkins and Salomon, 1989).

Kornhaber and Gardner (1991: p168), basing their views on a theory of multiple intelligences, agree that the curriculum should be broadened to do justice to the wide range of pupils' talents and differences in thinking, but contend that 'Thinking Skills need a domain within which to be applied'.

The Background Report by the Secretariat of the Centre for Educational Research and Innovation, OECD, in Maclure and Davies (1991: p201-223) provides a comprehensive analysis of the infusion vs the skills approach. However, many writers make the point that thinking **in** a subject is not the same as thinking **about** a subject.

Examples of 'infusion' strategies are problem-based teaching and learning (e.g. the Process-Based Instruction model: Ashman and Conway (1993); Drinan (1991) and Polya's (1957) heuristics in maths. The Cognitive Education through Science (CASE) programme (Adey, Shayer & Yates, 1989) is an example of the infusion of Thinking Skills in science. A variety of programmes aimed at teaching logic, reasoning and critical thinking in the humanities and the teaching of thinking through the use of computers and information technology are of the 'infusion' type.

2.7.2.1 Philosophy for Children

Perhaps the best known and most comprehensively evaluated example of the infusion approach is that of Matthew Lipman's 'Philosophy for Children' programme:

If what we want ultimately are thoughtful, inquisitive, imaginative, reasonable children, then thinking skills must be integrated into virtually every aspect of the elementary educational process. This in turn, would require that teachers be educated in such a way as to enable them to teach subject areas into which thinking skills have been integrated. (Lipman, Sharp, Oscanyan, 1980).

This programme is relevant for the purposes of this dissertation, in so far as a part of it (Elfie, Pixie, Kio & Gus) is designed particularly for primary school children. Through specially written stories, young pupils are stimulated to discuss philosophical principles and procedures aimed at cultivating critical and creative thinking through reasoning and judgement in the normal language lesson.

The programme necessitates a change in classroom climate where the children's discussions and contributions are valued and where the Thinking Skills are related to other disciplines and areas of study. This seems to make the deliberate attempt to teach for transfer which is considered so essential in the teaching of thinking (Adams, 1989, Salomon and Perkins, 1989; Sternberg, in Baron and Sternberg, 1987: p258). The results of extensive evaluations of this method suggest that many of the goals of the Thinking Skills movement can be attained by such an approach. These include not only improvement in cognitive areas, but in children's self-esteem, social skills and views of themselves as 'thinkers'. It has been suggested, however that this programme can be most successfully used where the

competence of teachers is high and with children who are most comfortable with the dominant middle class ethos of society. The emphasis on teaching thinking through language at the level of sophistication of Lipman's programme might be a problem where pupils are learning in a second language. The rationale for teaching thinking through language and improving language through the teaching of Thinking Skills, however, is particularly relevant in the South African context (Botha and Cilliers, 1993; Puhl, 1991). This will be discussed further under the integrated approach below.

2.7.2.2 Logo

Another commonly quoted example of an infusion-type programme is Papert's Logo (1980). This is a computer language for programming aimed at the overall improvement of children's thinking ability. But again, the question of whether the skills learnt in Logo transfer to other situations and contexts in the learners is questionable, as transfer and metacognitive aspects are not deliberately planned for and built into the programme.

The adoption of a problem-solving approach across the primary curriculum is a means of infusing the teaching of Thinking Skills into the existing curriculum and has been well justified and documented in a book edited by Robert Fisher (1987). It has particular relevance for this study, giving examples of successful implementation in language and writing classes, mathematics, computers, science and technology, in environmental studies and art. The most important aspect in all the examples given is the way that this approach, when adopted on a school-wide scale, seems to effect positive changes in teaching style,

teachers' attitudes and classroom practice in general. Learning and motivation in the children are also enhanced (Fisher, 1987: p3,45,258-260).

2.7.2.3 Project IMPACT

This programme seeks to infuse the teaching of higher level Thinking Skills into mathematics and language in order to improve performance. Its underlying assumptions are that all children are capable of improving their thinking; that Thinking Skills can be taught and learned; that thinking is best introduced in a social context and that the Thinking Skills must be related to the curriculum. It was developed by S. Lee Winocur and is described in Costa (1985). Teachers are trained to understand the theoretical base for teaching critical thinking; the methodology reinforces the social interaction required in the classroom and teachers are exposed to ten teaching behaviours. Materials are based on a 'universe of critical thinking skills' that directly affect reading comprehension and problem-solving in mathematics. Many of these aspects are common to programmes that fall in the 'direct' and 'integrated' approaches to the teaching of Thinking Skills.

It is becoming increasingly recognised that it is not only the importance of particular skills and processes that is at the core of what it means to teach thinking, but that attitudes, motivation and the encouragement of particular thinking dispositions (or the readiness to use the skills appropriately), are also of the utmost importance (Resnick, 1987; Nickerson, 1988; Paul, in Baron and Sternberg, 1987; Wallace and Adams, 1993; and Perkins, 1994 in his 'Rationale for the Architecture of a Thinking Course').

Thus any Thinking Skills programme which is concerned merely with long check-lists of **skills** would not be justifiable or acceptable to teachers (Mathfield, 1992) and could well degenerate into yet another requirement of curriculum developers at the expense of true understanding on the part of teachers. That the various skills be 'ticked off' mechanistically as 'having been covered' should be guarded against at all costs.

If our aim in introducing Thinking Skills in the curriculum is to improve teaching and learning as is argued in this study, then the **methods** used are as important as the strategies taught, for it is the methods that will produce change in the classroom.

It is this researcher's view that an integrated approach or mixed model for the teaching of thinking, taking into account dispositions and attitudes, is a means of achieving desirable and justifiable pedagogical changes in education. A Thinking Skills framework that improves teaching and learning and that also aims at long-term restructuring of the curriculum is proposed by Wallace and Adams (1993) in the 'Thinking Actively in a Social Context' model and is the approach adopted in this research study.

2.7.3 The integrated approach

A central theoretical issue surrounding the teaching of Thinking Skills (discussed in 3.2.2 above) is that of context-specificity of skills and knowledge as opposed to 'generalisability'.

The implications for the curriculum of this controversy are reflected in the policies of:

- Thinking Skills as separate courses, or
- development of thinking within conventional subject teaching.

A synthesis of the two approaches, however, is feasible and in fact recommended by many writers who see this as a means of combining the best elements from the various programmes (Baron and Sternberg, 1987: p5; Glaser (1984); Ennis, 1985; Resnick, 1987).

Any effort to teach thinking is unlikely to be as effective as it could be unless it combines these two approaches. (Nickerson 1988: p33-34).

Examples of the integrated approach

2.7.3.1 Instrumental Enrichment / CASE programme

The adaption of Feuerstein's Instrumental Enrichment programme was referred to in 3.2.1.3 above. The IE/CASE Programme (Skuy et al, 1990) was designed to counter the lack of specific bridging examples in the original I.E. Programme and the limitations in generality of transfer. The CASE (Creativity and Socio-emotional Development) programme aims at paying particular attention to self-concept and creative thinking by extending, modifying and complementing I.E. In addition to unique problem-solving approaches and attention given to feelings, the direct and explicit bridging of skills to academic subjects and to everyday life situations reflect the integrated nature of the approach. The pedagogy of the Thinking Skills movement with its emphasis on

metacognition, group work and autonomous thinking on the part of the learners is very much a part of this programme.

Designed for disadvantaged gifted adolescents learning in a second language, the I.E./CASE model has relevance for the majority of South Africans and could be adapted for primary schools.

2.7.3.2 Keys to Thinking

This is a programme written for Std 3, 4 and 5 (grades 5 through 7) South African children by a group of South African academics assisted by world leaders in the area of cognitive development, including Beatriz Capdevielle (Venezuela), Edward de Bono and David Perkins of Harvard University. Its aim is to effect thoughtful behaviour by 'internalizing in the pupil essential dispositions for good thinking' (Van der Vyver, 1994):

While it provides the pupil with a variety of thinking strategies or tools (skills approach) these can be infused in the L2 language curriculum. The materials can be used separately to teach Thinking Skills but they are intended to improve understanding and learning in all subjects. The aim of the programme as stated in the preface of the teacher's guide is to:

enhance planning, personal relationships, problem-solving, democratic decision-making, care for the environment and care for one another. (Van Der Vyver, 1994).

Keys to Thinking, promoted and published by the Upttrail Trust (**Upgrading of Teaching, Training and Learning**) presents a teacher with a novel approach that takes into account what has been learnt about teaching thinking to date and so has a sound theoretical base. Its 'choreography' according to Perkins is more complex than is usually found in courses to teach thinking:

We find ourselves working from a more complex and integrated model of "thoughtfulness" and "the good thinker". (1994).

The programme aims at teaching both language and thinking, and incorporates strategies, dispositions, conceptual development, 'epistemic and auto-regulative' aspects as well as paying specific attention to transfer (Perkins, 1994). Two-day training workshops are held to familiarise teachers with the rationale for the teaching of thinking and to instruct them in the use of materials.

2.7.3.3 Intelligence Applied

Intelligence Applied is an intellectual skills training programme based on Sternberg's triarchic theory of human intelligence. Sternberg (1987) regards intelligence in three ways.

Very simply put, they are as follows:

- the underlying mental processes that go on inside a person's head, and which contribute to individual differences in intelligence
- the impact of the environment in shaping a person's intelligence and how a person thus functions in a real-world environment

- the experiences of the individual and how he mediates between his internal and external worlds

In his article 'Teaching Intelligence : The Application of Cognitive Psychology to the Improvement of Intellectual Skills', Sternberg summarises as follows:

Intelligence is best measured when a task is either relatively novel or else is in the process of becoming automatic. In sum a theory of intelligence should specify how intelligence relates to the internal world of the individual, to the external world of the individual, and to experience. (1986: p196).

The student text and the teacher's guide contain background information on views of intelligence, why and how Thinking Skills and intelligence can be taught and on the triarchic theory that informs the programme. Practical and academic aspects of intelligence are built into the materials. The programme is, however, limited to secondary and higher levels with no materials available, as yet, for primary schools.

2.7.3.4 The TASC (Thinking Actively in a Social Context) framework

The fourth example of an integrated approach is the TASC model of Wallace and Adams (1993). This is designed as 'a framework which teachers can use to develop their own Thinking Skills courses which are relevant to the age and background of the learners in their care' (p6). It is based on current research in the fields of intelligence, children's learning, teaching methodologies and the teaching of Thinking Skills. It outlines aims for teachers, for pupils and for the curriculum. It therefore presents a framework for school-

based curriculum development which aims to improve teaching and learning in such a way as to lead to incremental changes in schools and long-term restructuring of the curriculum.

The TASC model is presented in three 'tiers' which outline

- a core of **Basic Thinking Skills**
- some **Tools for Effective Thinking** and
- a **Problem-Solving Model**

These are taught separately ('direct' approach) using real-life examples and then **integrated** across the curriculum. Materials being developed consist of a Starter Kit (Evans and Wallace, 1994 in press) for teachers and pupils comprising ten modules of Basic Thinking Skills and Tools. Each module comprises two 'stress-free' activities and two lessons applicable to the curriculum. Activities using the Problem Solving Wheel are included. The **environment** is used as a theme for lessons overlapping some content subjects in the primary and lower secondary school. The TASC framework outlines its teaching methodology as follows:

The Ten TASC Teaching Principles

- Adopt a model of the problem-solving process and explicitly teach this
- Identify a set of **Basic Skills** and **Thinking Tools** and give training in these
- Develop a vocabulary to suit the learner
- Give ample practice in both the skills and the strategies
- Give attention to the motivational aspects of problem-solving
- The progression of teaching is from modelling by the teacher to guided activity by the learner, and eventually autonomous action by the learner

- Every effort must be made to enable the learner to transfer **Basic Skills** and **Thinking Tools** to new contexts
- The emphasis is on co-operative learning in small groups
- Teachers should encourage pupils' self-monitoring and self-evaluation
- Students should be encouraged to develop their metacognitive knowledge

In adopting an integrated model certain characteristics of the skills approach would be adopted (i.e. identifying a set of basic thinking 'tools' and teaching these explicitly). Their relevance to other subjects in the curriculum could then be negotiated with subject teachers on a whole-school basis. Nisbet and Shucksmith (1986) clarify 'skills' as similar to 'procedures,' and 'strategies' as combinations of skills that are more generalizable. If teachers and students are taught to recognise which skills and strategies are most relevant and applicable within specific subject domains and are given opportunities to practise these across a number of areas and to think about their thinking, then according to Coles, 'a cross-fertilization between discrete programmes and the traditional disciplines' could be achieved and thinking programmes could 'act as a catalyst to influence the pedagogy and curriculum of the whole school':

And if teaching thinking is regarded as an educational ideal which must take into account character traits, dispositions and habits of mind as well as particular skills, it should not then become undervalued as just another skills area. Rather, a skills, dispositions and attitudes conception of teaching thinking construes it as a fundamental ideal and a movement for educational reform which should inform the entire range of educational activities and affairs. (Coles, 1993: p338).

Such an educational ideal is reflected in the approach adopted in this research project and is an example of how the skills and infusion approaches can be integrated.

2.8 Methods common to all approaches

The literature on Thinking Skills seems to suggest that specific techniques and methods are common across approaches. Most of these require a change of role for the teacher which has been implied throughout this review. The following list serves as a summary:

- Co-operative learning in small groups (Palinscar and Brown, 1984; de Bono, 1973; Pennefather, 1992; Wallace and Adams, 1993; Whimbey and Lochhead, 1984)
- Modelling (Adams and Wallace, 1993; Tharp and Gallimore, 1988; Skuy et al, 1990: p29)
- Mediation (Vygotsky, 1978) Criteria for Mediated Learning Experiences, (Feuerstein's 1980; Skuy et al, 1990)
- Metacognition and self-monitoring (Wallace and Adams, 1993; Skuy et al, 1990 - metacognition and 'meta-emotion'; Keys to Thinking - the idea of a 'thinking coach'; and Muthukrishna and Borkowski, (1990...) 'working models')
- Questioning techniques: towards a more Socratic or 'dialogical' method (Paul, 1984); Project FACE- 'forms of questions', Maclure and Davies: p140; Williams and Sternberg, 1993)
- Attention to attitudes and motivation and the self-esteem of the learners (TASC, I.E./CASE and Keys to Thinking)
- Encouraging reflection and teaching for transfer (Salomon and Perkins, 1989; Sternberg, 1983; TASC). This is particularly so in **integrated** approaches which build practice of the Thinking Skills into subjects across the curriculum.

2.9 Conclusion.

This chapter has dealt with the theory and methodology of the 'teaching for thinking' movement as a means of contributing to better teaching and a more enabling curriculum. The different approaches, programmes and methods used in the teaching of Thinking Skills have been reviewed in the light of their relevance to the South African context and to primary schools in particular.

Having considered some of the principles that would enhance teachers' competencies and develop their professional knowledge, the question of how to engage teachers in the suggested changes is crucial. The exposure of teachers to the 'Thinking Actively in a Social Context' framework (Wallace and Adams, 1993) in a series of centralised workshops and school-based activities is the focus of this dissertation, and could provide a model for local curriculum development. The project described in this study gives teachers the opportunity to put theory to work in order to improve practice. Issues relating to school based curriculum development, therefore, will be reviewed in the next chapter which deals with the research design and methodology.

CHAPTER 3

SCHOOL BASED CURRICULUM DEVELOPMENT: RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

The literature on the theory and rationale of the 'teaching for thinking' movement, its approaches, methods and programmes was reviewed in Chapter Two in order to justify the introduction of Thinking Skills in a curriculum innovation on which this research was based. The study focused on teachers' responses to a series of Workshops and school visits which are described in Chapter Four. These formed the structure of a networking initiative between representatives of the five education departments in the KwaZulu-Natal region which are currently being amalgamated. The TASC project (3.3.1) promotes a school based curriculum initiative which aims at training teachers to use the 'basic thinking skills' and 'tools' of Wallace and Adams' (1993) model with its accompanying methodology.

It is critical to evaluate to what extent this school-based approach is effective in meeting some of the professional needs identified by teacher-participants in the first Workshop (Chapter Four / Comparison grid: Appendix 2), and the problems of schooling in general as outlined in 2.4.2 above.

3.1.1 School-based curriculum development

Given the problems in education and the need to revitalise the curriculum, teachers it would seem, must be central to any reform process (Stenhouse, 1975; Elliott, 1990; Mathfield, 1992). The question of how centralised or decentralised curriculum decision-making should be (Nepi Curriculum Report, 1992) is outside the scope of this dissertation. However, if teachers are going to be more than simply implementers of a curriculum dispensed from above, ways must be sought to involve them in a process whereby they can contribute from their funds of practical knowledge, to improvements in schools and schooling. If we are 'to replace an undemocratic, coercive, ineffective and irrelevant education system with a democratic, participatory and relevant one' (Vusi Khanye in King and Van Den Berg, 1991: p24) then school based curriculum development must be an option.

3.1.2 Teachers at the centre of reform

Very often teachers' theories about their work exist at a tacit level (Elliott, 1990; Johnston, 1990) and are never expressed because there is so little time for deliberation and interaction within the profession. The 'teacher as researcher' movement (Stenhouse, 1975; Elliott, 1990) was particularly strong in the U.K. and Australia in the 70's and 80's. Here models of school-based, teacher-initiated curriculum development evolved which were less prescriptive than the objectives models of Tyler (1949), for example (in Marsh and Stafford, 1988) which had dominated curriculum planning. Decision-making became more participatory and inclusive and teachers became involved in researching problems that

affected teaching and learning in their classrooms. Structures were created whereby they could provide solutions and bring about change: they could contribute to curriculum development. Although the majority of teachers in the South African context may not have the confidence and expertise to see themselves as contributors to change, opportunities can and must be provided. Many of our teachers do have a strong social awareness and understanding of political issues than can be built on despite the negative impact of a coercive system on their creative and critical thinking. Training in Thinking Skills as discussed in 2.3.3 above would contribute to the development of professional knowledge and autonomous thinking in teachers which in turn could lead to small incremental but ultimately real changes in the long term structuring of the curriculum (Wallace and Adams, 1993). Being part of a team working with a qualified co-ordinator, 'could become a source of pride and enhance the growth of a teacher's self-image'. (Sabar, 1985). The extent to which the workshops held during the TASC project contributed in this way, is of interest here and will be evaluated in Chapter Five.

3.1.3 The advantages of school based curriculum development

School based curriculum development which involves teachers in a better understanding of their practice through self reflection and collaborative efforts such as this research study, can provide the mechanisms for attempting new strategies and promoting curriculum change. The advantages of SBCD are summarised as follows:

- it provides a means of responding to the contextual needs of pupils, teachers and communities in a way that centralised structures cannot

- it is a means of promoting professional growth, interest and competence of teachers by reflecting on problems and concerns and contributing to solutions
- it enables teachers to experience team-work and be part of the process of democratic and co-operative planning and decision-making
- it enables teachers to work with outside facilitators and researchers in academic institutions or through teacher organisations in joint projects and workshops
- it enables schools to be 'self-renewing institutions'
- and it encourages the autonomy of schools.

(Sabar, 1985).

The 'Thinking Actively in a Social Context' framework was considered an appropriate vehicle for school based curriculum development in the light of its aims for the teacher and its teaching methodology (see paragraph 2.7.3.4) which are congruent with many of the above.

3.1.4 SBCD - a contested field

However, SBCD is still a contested field and its meaning varies from country to country depending on the political, social and cultural context in which it operates. The understanding would also vary according to how centralised or decentralised educational structures in a country are, or how autonomous the schools. Prideaux (1993) suggests that SBCD in Australia in the late 80's and early 1990's became a form of organising or 'managing' teachers and schools indirectly rather than a genuine devolution of curriculum authority to schools. While we in South Africa are urged to move towards more

'grassroots' participation and decision-making (Nepi Report on Curriculum: 1992), it is interesting to note moves towards more centralised structures in the U.K. and other developed countries. What is argued about SBCD, however, in these countries - despite moves towards more centralised control - may well apply to the local situation:

In the 1990's there is still a role for teachers as active curriculum developers. The role involves not only deconstructing and transforming curriculum at a school level, but also working beyond the school to analyze the locus of control of curriculum and participate in activities aimed at wider curriculum and educational reform. (Prideaux, 1993: p176).

3.1.5 Justification for school based curriculum development despite limiting factors

In Chapter Two the situation in schools in South Africa was discussed. Practice is dominated by teachers who perceive themselves as implementers of a rigid syllabus. The education system has aimed at imposing structures to control outcomes and schooling. Teacher autonomy has been severely restricted and most teachers work in 'authoritarian and bureaucratic education departments which largely exclude them from curriculum decision-making' (Nepi Curriculum Report: p24). On improving teaching and learning practices the report states:

There can be little doubt that teaching and learning practices in South African schools need revitalising ... Since curriculum renewal is unlikely without the involvement and empowerment of teachers, changes in curriculum policy need to include measures to increase teacher participation in curriculum development and to improve classroom practices. (p24).

It is in this context that a school-based approach was adopted in this study despite the following limiting factors:

- low levels of teacher autonomy, morale and professionalism in a volatile education situation (Walker, 1990; Johnston, 1990; Montero-Sieburth, 1992)
- that change is threatening, both personally and professionally: a sense of security is required for self-evaluation (Wallace and Adams, 1993)
- narrow focus on classrooms and schools without considering broader issues
- possible absence of good leadership
- financial and time constraints

With reference to the last point, Raubenheimer states:

School-based activities are time-consuming and resource-intensive, which means that greater staffing and financial resources are needed to sustain project activities. (1992/1993).

Marsh (1988) and Brady (1987) emphasise the role of the principal in creating satisfying and conducive working and organisational climates in order for SBCD to be effective.

3.2 SBCD: the TASC framework as a vehicle for change

Despite the crisis in education in our country, it is this researcher's view that there is definitely a place for SBCD in the South African context as everyone begins to learn what it means to live in a democratic society. Not only at the national level, but at schools level, too, more participatory structures have to be found to address the problems in education and curriculum development. TASC provides the kind of structures and processes within

which meaningful teaching and learning can occur. Notwithstanding the limitations of SBCD, our greatest investment should be in our teachers. Flanagan (1992) warns facilitators/teacher educators, however, of attempting to intervene with programmes that aim to be transformational without 'engaging critically and actively with the pedagogical understanding with which teachers have been inculcated' (p43). This researcher has had to bear in mind constantly the differing contexts and backgrounds of her subjects in this study, drawn as they were from five, racially segregated education departments. (See Mathfield (1994) Network Committee Report - page 7 - explaining the composition of participants in the TASC project). Collaborative projects such as the one focused on here, serve to bring teachers together to reflect on their practice and so provide a mechanism for heightening awareness in participants of their potential to become agents of change.

Having discussed the school-based nature of this research study, it is important to justify the use of the **workshop** approach in the curriculum initiative undertaken.

3.2.1 The Workshop approach in the TASC project

The method of working with teachers in centrally organised workshops, followed by school-visits and whole school involvement, will be described in Chapter Four of this study. At this point it is necessary, however, to consider briefly, the term 'workshop' and its meaning for the purposes of this dissertation. The project under discussion was initiated by an inter-departmental committee which supported the principle of networking as a facilitating structure for the transition to a unified education system. The workshops in this study, therefore, provided a **networking** forum which aimed to foster understanding

between teachers who had never before shared professionally across racial barriers, and to introduce them to new educational concepts.

3.2.2 Workshop methodology

The key elements of the workshops were similar to those described by Von Hirschfeld and Downs (1992) for 'bringing about change through understanding' (p28). They were considered by the researcher as an 'activity setting' (Tharp and Gallimore, 1988; Adams, 1994) which would provide assistance in a number of forms underpinned by the Vygotskian notion of the zone of proximal development. They were conducted in the TASC way based on Wallace and Adams' (1993) ten teaching principles: teachers were encouraged to respond to each other's needs and to work and learn collaboratively in small groups. New ideas were modelled for them and opportunities provided for practice. Monitoring and self-evaluation of the thinking strategies were encouraged and time given for reflection. These are very different teacher-training strategies from those employed in most INSET workshops which do not 'involve the teacher actively in the process' (Davidoff and van den Berg, 1990: p4).

The role of the workshop as an effective change strategy, when implemented in a prescriptive manner, needs serious reconsideration. Without consideration of contextual issues, it has limited viability for producing change in teaching practice. Inset practitioners need to reflect upon the view of change and style of workshops they are adopting, especially as workshops have dominated Inset practices in South Africa. (Raubenheimer, 1992/93: p70).

A perceived disadvantage of the workshop approach is that it is conducted away from the reality of the classroom. In the case of this project it was **advantageous** for participants

to gather at a centralised venue for the input, experiential and reflective part of the process, while the follow-up school visits facilitated implementation in practice (see Chapter Four). Staff workshops 'on site' were also held.

In the sense that the workshops were aimed at training teachers in teaching Thinking Skills across the curriculum which were new to them, the researcher's observation and assistance with the transfer of skills and strategies to the classroom was similar to the 'peer coaching' concept of Showers (1983), who indicated this as an essential characteristic of an effective training/staff development programme.

3.2.3 Summary of workshop approach and the SBCD movement

In reviewing the literature on staff development workshops the following points, in addition to those embraced in the TASC methodology and the notion of 'activity settings', serve to summarise desired goals:

- clearly defined goals and objectives based on assessed needs
- follow-ups and co-teaching
- exposure to theory
- demonstration
- modelling, followed by practice and then feedback from knowledgeable persons on performance

The importance of collegial discussion following training was also felt to be important (Washington, 1987; Showers, Joyce and Bennett, 1987) and this was facilitated in the TASC project at the workshops and school visits.

School based theorists and proponents of a process approach to curriculum development place the teacher at the centre of educational reform. The school-based curriculum design movement has come to be articulated as 'action research' and it is an action research design which has been chosen for this research study.

3.3 The research design and methodology

The review so far has included a brief background to the Thinking Skills movement. What thinking is and why we should teach it have been discussed as well as recent theories of intelligence and theories of learning. The relevance of these to the South African context has been considered: what is happening in schools and, more importantly, how teachers are teaching. The pros and cons of school based curriculum development were evaluated and the workshop was considered as a means of effectively training teachers to teach Thinking Skills. The choice of intervening with the 'Thinking Actively in a Social Context'- TASC- framework (Wallace and Adams, 1993) was explained briefly. TASC was viewed as a means of empowering teachers to become agents of change in their schools. The background to the research project will now be explained.

3.3.1 Background to the study

Factors influencing the design and methods used in this research project have been referred to in the preceding review. It is important now to sketch the background to the study and how the opportunity for the research arose. The project which is the focus of the research was initiated because of the circumstances peculiar to the education crisis in South Africa at this particular time in the country's history. The TASC project was one of a number of initiatives of the Inter-Departmental Network Committee of the KwaZulu-Natal region. It aimed to begin the process of co-operation between the historically separate education departments segregated politically on the grounds of race under the apartheid system. In anticipation of the transition to democracy during the period of protracted negotiation towards a political settlement prior to the 1994 April election, most educationists predicted a unitary system of education to be one of the first realities of the new dispensation. This committee pledged:

to strive for a unitary and equitable education structure that caters for the educational needs of all pupils in the province of Natal. (Minutes JIC Meeting, September 1992: see Appendix).

Efforts towards this end began, and ways were sought to start 'networking' between professionals in the five previously separate education departments who had had very little contact with each other.

The education departments which planned to work together were:

- The Department of Education and Training (referred to as the DET)
- The Kwazulu Education Department (Black Education);

- The Department of Education and Culture which consisted of: The House of Delegates (Indian Education) The House of Representatives (Coloured) and The Natal Education Department (NED) - responsible for the education of Whites in the region.

Various networking projects were outlined, one of which was the TASC Project.

The TASC Project: Thinking Actively in a Social Context

This was to be a collaborative venture involving the University of Natal's Curriculum Development Unit, the former Natal Education Department and the Environmental Education Initiative. It was felt that common ground could be explored by using two new aspects of curriculum heretofore unexploited in schools: the teaching of Thinking Skills and environmental education. The latter would provide commonality in as much as environmental themes overlap subjects in all five Departments, the most obvious being Geography, History, Science and Health, with the further overlap of Agricultural Science as prescribed in DET and KwaZulu schools. Language lessons could also be used to teach Thinking Skills with environmental themes as the subject for discussion. English is the medium of instruction in all five Departments from Std 3 upwards. It is, however, a second language to the majority of children in the region. Intervening with a Thinking Skills approach would be appropriate across all Departments. Previous efforts at introducing a skills-based approach in NED schools are documented by Mathfield (1992), and a problem-solving approach based on constructivist theory is being piloted in NED primary schools. A similar approach based on Polya's heuristics (1957) has been

introduced in maths in Indian Schools. The **explicit** teaching of Thinking Skills in the primary curriculum would, however, be new to all teachers.

The TASC model of Wallace and Adams, (1993) was chosen for the project for a number of reasons:

- its sound theoretical underpinnings in terms of teaching, learning and the curriculum
- its relevance to the local context arising as it did out of research done by the authors largely in KwaZulu schools (Adams and Wallace, 1988).

The model was identified by Mathfield in his research into the problems related to the teaching of Thinking Skills (1992) as having the potential to effect significant change in education generally, for improving teacher-training and for curriculum development (Mathfield, 1992: p124). Particularly important for the purposes of the Networking Initiative were the TASC model's emphasis on **relevance** (i.e. the explicit teaching of thinking processes, strategies and problem-solving in a 'real-world' context that would be culturally meaningful to all pupils). The stress on motivational and attitudinal aspects, aimed at enhancing self-esteem, co-operative learning and autonomous thinking were also important advantages.

It was this search for common threads of interest with which all the teachers could identify that created the structures for the TASC project and which determined many aspects of the design.

3.3.2 Statement of the problem and reasons for the research

The problems in education in general and in South Africa in particular were discussed in Chapter Two, and were referred to as 'disabling', not only for teachers and learners, but in the broadest sense, for the curriculum as a whole. Two factors influenced the subject and design of the study: the previous interests and experience of the researcher in practice and the course work which counted for 50% of the degree.

3.3.2.1 Personal experience of problems

The most noticeable factors observed in the researcher's own experience were the predominance of the transmission mode of education, rote-learning and syllabuses overloaded with content at the expense of relevant learning experiences for most pupils. The researcher had previously been involved in a curriculum initiative which introduced Thinking Skills as a component of an enrichment programme for very able pupils at a multi-racial, but largely white, private school in Johannesburg. Instrumental Enrichment (Feuerstein, 1988) was used as the springboard for this, as well as being used by the researcher in her capacity as a remedial teacher to address cognitive deficiencies in learning disabled children who were withdrawn for special classes. The researcher helped in developing a Thinking Skills programme for an outreach project for a disadvantaged urban community in the Transvaal. More recently, and on a smaller scale, a problem-solving approach was introduced to pupils in a remote farm school in Southern Natal where the researcher now resides. The responses of both teachers and pupils involved in each of these projects seemed significant at the time in terms of less passivity, more enthusiasm,

increased individual effort, co-operation and improved self-confidence in communication.

The Inter-Departmental Network Committee's project, using the TASC framework proposed by the Curriculum Development Unit of the University of Natal, therefore, provided the researcher with an opportunity to apply academic research discipline to investigate the effectiveness of introducing teachers and learners to Thinking Skills in a controlled study. It would also address problems arising from recent research into the teaching of Thinking Skills (Mathfield, 1992) that could contribute to the body of research aimed at improving educational practice. Both the aims of the project in providing the opportunity for teachers to develop their professional knowledge collaboratively across previously imposed racial barriers, and the aims of the TASC framework, were particularly relevant to and congruent with the researcher's own personal responses to the social problems of apartheid South Africa in general and to the needs witnessed in schools during her years of practice in education.

3.3.2.2 Understanding through course work

The literature studied in the course work on the theory and practice of curriculum development, particularly that of the curriculum reform movement of the 70's and 80's (Elliott, 1990; Marsh, 1988), led to the following exciting insight: the curriculum innovations in which the researcher had been involved in practice had followed typical patterns described in theory as 'problem-solving cycles' or 'action research spirals' (Marsh and Stafford, 1988). The researcher at the time, however, was unaware of the relationship of practice to theory. The recognition that 'ordinary teaching' could be articulated in

educational research literature as theory, was very exciting. The TASC project thus provided the opportunity for engaging in **action research** with the knowledge and understanding of how this research method can help teachers to articulate their 'personal practical knowledge' (Elbaz, cited in Johnston, 1990) and so to improve practice and contribute to curriculum decision-making. It was a justifiable way of attempting to link practice to theory.

The way in which the sites and subjects for the project were chosen is described below.

3.3.3 Sites and subjects

3.3.3.1 Choice of schools

For the TASC project it was decided by the Network Committee that one school from each of the five Departments would participate by sending, on average, three teachers each to a central venue in Pietermaritzburg. Firstly, schools were chosen on the strength of their proximity to the city centre. This would facilitate ease of attendance by teachers who would be required to participate in four workshops over an eight month period, partly during school hours. Reciprocally, the facilitator/lecturer/researcher would visit the pilot schools during the weeks in between the main workshops to help the TASC delegates with the implementation of the Thinking Skills in the classrooms and to facilitate discussion of the TASC curriculum innovation between the workshop delegates and their fellow staff members. For the researcher, therefore, the proximity of the schools to the city was also an important factor.

Secondly, schools were chosen on the recommendation of the Inspectors of each department as those which were most likely to co-operate fully and to sustain interest over the period of the project. This presupposed a degree of interest and motivation on the part of each school principal in being involved. The schools were as follows:

School A - Department of Education and Training. This is a large, urban black primary school in a relatively good socio-economic area, bordering on a very poor squatter area, disrupted by violence. The pupils are all Zulu speaking but English is the medium of instruction from Std 3 onwards. The enrolment stands at 1019 pupils (SSA-Std 5). The staff consists of the principal and 23 teachers. Classes are therefore very large.

School B - House of Delegates. Most of the pupils are Indian. A small number of black children were admitted when the model C option was implemented. The first language (and language of instruction) is English. There are approximately 500 pupils and a staff of 24 including the principal.

School C - House of Representatives. This school was originally intended for so-called Coloured children. When the model C option was introduced schools were allowed to decide on their own admissions policies with the result that a large number of black, Zulu speaking children now attend this school. The medium of instruction is English from class one. The school is conveniently situated in the city's central business district but draws from those in the poor socio-economic bracket. The school is under pressure to admit ever-increasing numbers of children whose parents work in the city.

School D - Natal Education Department. This is a 'white' model C school in a wealthy, English speaking area. A very small number of children of other race groups has been admitted to date. It has an enrolment of 842 pupils. There is a principal, two deputies, 28 class teachers and 4 staff members who do not have classes.

School E - Kwazulu Education Department. This school is situated 30km outside the city in a very poor rural area. Many parents are unemployed and the region has been badly affected by political violence. Numbers stand at 534 pupils and 18 staff members, including the principal. English is the medium of instruction from Std 3 upwards, but all the children are Zulu speaking. Very little English is spoken in the community. There is no electricity or running water.

3.3.3.2 Selection of subjects

The TASC project aimed to find areas of commonality between teachers who had no experience of inter-racial professional contact. As **the environment** was to provide a common theme overlapping syllabuses (3.3.1 above), teachers were invited who taught any of **the following subjects**: Geography, Science, Health or Agricultural Science. They were to be senior primary teachers (Std 3 - 5) so that English would be the medium of instruction common to all. Selection of teachers, therefore, was dictated by the need to have commonality of subject matter and language. In this way the **Thinking Skills** would not impinge on normal teaching time as these could be infused into content subject lessons.

[In retrospect, it was felt that these criteria were not in fact the best for the purpose of training teachers in Thinking Skills. The **language** teachers would have found it easier to incorporate the skills into their lessons than specialist subject teachers who only saw the pupils twice a week (see interviews, appendices and later discussion on limitations and difficulties). Neither were **motivation** on the part of any teachers interested in curriculum development or **leadership qualities** considered as criteria in selecting the subjects.]

Eighteen teachers representing five different departments were enrolled for the TASC project and became the subjects for the research study:

- School A - two Standard 4 class teachers, one Standard 5 English teacher and one Standard 5 Maths and Science teacher
- School B - one Standard 5 Science teacher, one Standard 5 Geography teacher one Standard 5 Health and English teacher and one Class 2 teacher
- School C - one Standard 5 Geography subject specialist and one Standard 5 Science subject specialist
- School D - one Standard 3 class teacher, one Standard 4 class teacher and one Class 2 teacher
- School E - one Standard 2 class teacher, one Standard 3 class teacher one Standard 5 Science teacher, one Standard 4 Health and Science teacher and one Class 2 (SSB) teacher

As it happened some schools did send Junior Primary teachers: these individuals expressed an interest in Thinking Skills and a personal desire to be involved in the project for their own professional growth. These teachers formed a stable group which, apart from one teacher who was transferred early in the year and who was replaced, did not change. Attendance was 100% from 16 teachers with only two teachers missing one of the main workshops each.

3.3.3.3 Access and ethics

The problems of access and ethics in school-based research are discussed by Burgess (1985: p196) and some of the problems outlined made the researcher aware of her privileged position in this particular study. Firstly, much of the groundwork had been done in that the schools chosen were made aware at the first introductory talk, (4.1.1 below) of the nature and scope of the project. A research role was already negotiated and only had to be clarified. However, the researcher felt it important that the participants should not at any stage feel that their activities were secondary to the research. In fact it was an explicit intention that the researcher's work would be as unobtrusive as possible. It was clearly explained to delegates at the first workshop that the observation in the classrooms by the researcher was to get a feel of the special social and cultural context of the teachers' and children's worlds and to gain an understanding of the varying levels of the children's language competencies across the Departments. It was thus hoped that the teachers were not threatened by the presence of the researcher, as the purpose of the observation from this point of view was not to assess their teaching, but for the researcher to gain

understanding that would be of mutual benefit when the Thinking Skills were introduced and feedback given at subsequent workshops.

Thus access to the classrooms was established by view of the fact that the schools were participating in a joint venture with the researcher. They had been identified as 'innovative' schools and were looking forward to the contact, which eschewed the problems which could easily have hampered access. Secondly, the teachers were aware of the need for help with the introduction of the TASC problem-solving approach which was new to them. The focus, while aiming in the long term to effect change in practice, was on successful implementation. The researcher did not feel, therefore, that the research was 'subversive' (Burgess, 1985: p197). The principals of schools and their respective staff members were prepared for the researcher's presence as either 'observer' or 'participant' or teacher/facilitator for the project.

Whereas the access was unhindered, the ethics were sometimes personally questionable to the researcher who did use the observation sessions in the early stages to evaluate the teachers' methods, despite different reasons being given for her presence. On some occasions she did feel uncomfortable morally/ethically, for so doing. However, the establishment of good field relations was of crucial importance in this study. The researcher consciously nurtured feelings of trust and confidence between herself and subjects. This was strengthened by the methodology of the TASC framework (3.2.2 above) as practised and experienced by the delegates.

3.3.4 Intervening with a Thinking Skills approach: the hypothesis

The overall strategy or framework for the research began to emerge at the planning stage. The aim was to train primary school teachers in Thinking Skills based on the TASC model using TASC teaching methods. The Workshops would expose them to the theory underpinning the 'teaching for thinking' movement, and the school visits would facilitate practical implementation of the Thinking Skills and processes.

The researcher hypothesised that, by intervening with Thinking Skills based on the TASC framework and methodology, teachers would start reflecting on their present teaching methods and perceive that changes could be made that would improve their practice. Implementing small changes in their classrooms could in turn have a ripple effect within their schools.

She hoped by means of the research to test whether the impact of the workshops with the theoretical input, the modelling of lessons, the collaborative group work, co-operative planning and reflection, would effect any positive changes in the way the teachers taught. If the Workshops were then followed by school visits which offered carefully planned activities based on optimal teaching/learning experiences mediated by the researcher, then a strong possibility would exist that teachers would be influenced towards a positive response. These activities would include the following:

- staff lectures and workshops
- modelling by the researcher of Thinking Skills lessons in the classroom

- guided practice by the teachers (as learners) of the new ideas: i.e. implementing the Thinking Skills in lessons with the researcher present to encourage and give feedback

This kind of intervention, with critical reflection, could lead to autonomous action by participants and changes in practice.

The research would investigate these changes in the light of the problems existing in classrooms as described by participants and the 'disabling' factors mentioned in 2.4.2 above.

It was felt that teachers would grow professionally during the course of the project and that their perceptions of themselves as change-agents could shift to the extent that they would feel able to influence the curriculum in some way. Their understandings of teaching and learning, given input on recent educational theory and opportunities to put theory into practice, should to the researcher's mind, be enhanced and thus lead to improvements in practice.

An investigation of teachers' responses to the workshops on Thinking Skills would seek evidence that these hypotheses were to some extent true.

As the investigation focused on teachers' professional development it would involve on-going interaction with subjects over a long period. Qualitative research methods rather than quantitative ones, therefore, were envisaged.

3.3.5 Choice of design and method

The design and methods chosen for the research were largely influenced by the above-mentioned pre-determined structures of the TASC project, which were arranged by the Network Committee prior to the start of the Workshops. The researcher was asked to take responsibility for the introduction of the TASC model to the teachers by presenting at the Workshops and following these up with visits to each school as a form of school based curriculum development. The project was to be on-going over a period of eight months and was interactive in nature. It necessitated establishing relationships with the principals of the schools and with the teachers, as well as nurturing these relationships in order to do the follow-up work in the schools effectively.

A quantitative study could have been undertaken by pre-test, post-test methods measuring the effectiveness of the Thinking Skills instruction on groups of children in the pilot schools. However, the researcher's main interests were in teachers' professional growth and development. She believed that energy and effort should be invested in the long term development of the teachers' skills, rather than in any short-term gains as measured on the children. In addition the aims of the project might be threatened by the idea that the researcher was 'testing' the effectiveness of the teachers. This was felt to be a particularly sensitive issue given the social and political conditions in the country. Also, the researcher was 'white' and would be entering schools of other race groups where, in some cases, this could be threatening for teachers. With these considerations in mind, and with the desire to nurture and foster good relations with her subjects on an on-going basis, the researcher felt very strongly that the research should be qualitative in nature.

3.3.6 Qualitative vs quantitative methods

Research is traditionally characterised as being 'objective', implying that it should be reliable, valid, generalizable and credible. The 'classical' scientific approach to research lays great emphasis on quantitative data, for example, by classifying and measuring behaviour of objects under study in a positivistic way. This implies that an investigation has an hypothesis, which is testable and replicable, which provides an explanation and is generalizable. The research style is highly formalized, systematic and controlled with definite stages of action (Pollard and Tann, 1987: p23). While this methodology has always been applied to the natural sciences, views differ as to its suitability for social inquiry. Positivists think that social science should base its methods on the model of the natural sciences while those who think it should not, are called humanists or anti-positivists (Mouton and Marais, 1988). This alternative form of sociological research emerged as a result of the view that narrow positivism fails to address the subjective perceptions of the people who are the subjects of study. This research is concerned with the opinions and perceptions of the teachers participating in the project, and so 'ethnographic' methods were deemed the most suitable. These enable one to do research in the natural setting of the subjects being studied (in this case, teachers in their classrooms). In this way one can arrive at some kind of understanding of the social context which influences the perspectives and actions of the subjects, having described and analyzed one's observations and interactions with them. Ethnographic research methodology is also referred to as 'interpretive' or 'qualitative'. The techniques of participant observation and interviewing, characteristic of qualitative methods, were considered appropriate for the purposes of this

study. This style of investigation is also referred to as 'field research' where the aim is:

not to explain human behaviour in terms of universally valid laws or generalizations, but rather to understand and interpret meanings and intentions that underlie everyday human action. (Mouton, 1988).

3.3.6.1 Advantages of a qualitative approach

In this project a number of cases are studied in depth in order to gain a view of the whole situation which would be considered valid by the participants. Considering the nature of the project's aims and the structures set up for it, the following factors influenced the choice of a qualitative approach:

- The researcher required a **flexible** approach within which to work, rather than a formal, linear progression of research stages. The interactive, participatory nature of the project demanded this.
- The researcher wanted to gain an understanding of the teachers' worlds and the factors influencing their practice which meant dealing with **values and subjectivity**.

In the review of school based curriculum development (3.1.1 above) **action research** was considered as an approach within the qualitative or interpretive paradigm which aims to bridge the gap between the generation of theory and actual practice (Winter, 1987). **Seeking** as it does to improve and understand practice through the direct action and involvement of practitioners, it was seen to be particularly relevant to this research project.

3.3.7 Action-research: Case-study and school-based curriculum development.

The aims of this study have been stated as follows:

- to provide an opportunity for teachers to share and exchange ideas about their own teaching situations
- for teachers to articulate some of the problems faced in their classrooms and to consider ways of improving teaching and learning in order to avoid the reproductive effects of schooling
- to develop teachers' professional knowledge by exposure to recent research in cognitive education
- to teach Thinking Skills as a means of changing passive learning habits to active involvement, self-regulation and autonomous thinking on the part of pupils
- and in the long term to encourage teachers to contribute to curriculum development

An action research approach was therefore felt to be appropriate for an educational study of this nature.

3.3.7.1 What is action research ?

Carr and Kemmis describe action research as follows:

Action research is a form of self-reflective enquiry undertaken by participants in social situations in order to improve the rationality and justice of their own practices, their understanding of these practices, and the situations in which the practices are carried out. (1986: p162).

Hopkins (1985) quotes an earlier description:

It is most rationally empowering when undertaken by participants collaboratively, though it is often undertaken by individuals, and sometimes in co-operation with 'outsiders'. In education, action-research has been employed in school-based curriculum development, professional development, school improvement programs, and systems planning and policy development. (p32).

Many aspects mentioned here are relevant to this study. The TASC project was participatory and collaborative in nature. The teachers involved in the project came together from starkly different social situations. They went to school and were trained under different circumstances with different educational provision due to the racially based allocation of resources under the apartheid regime. Their understanding of their practices will have been differently influenced ideologically, and their situations in which they practise are equally dissimilar. For these reasons, the opportunity to work together collaboratively within an action-research framework was particularly enriching for participants and for the researcher.

The Workshops provided the opportunity to engage in self-reflective enquiry in all the above-mentioned areas while the introduction of the TASC theoretical model provided the basis of discussion for the clarification of educational goals. The training in, and practical implementation of Thinking Skills and a Problem-Solving Approach across the curriculum provided teachers with the opportunity to reflect on their current methods of teaching. The school visits, classroom observations, and feedbacks at workshops followed closely the original Lewinian notion of action research where the researcher was actively engaged in the process of planning, acting, observing and reflecting. The project in fact provided the

opportunity for each participant to reflect on and address problems in his/her own educational setting. The method of intervention could be said to be based on principles leading:

gradually to independence, equality and co-operation.
(Lewin, in Hopkins, 1985: p33).

The extent to which this did or did not happen is discussed in Chapter Four. In so much as action research aims to **improve practice** and the **understanding** of practice by teachers, as well as involving them in an attempt to improve their own teaching **situation**, (Carr and Kemmis, 1986: p165) this model was particularly suitable for this study.

As a school based curriculum innovation the research project also followed the action research models (with variations and modifications) described by Kemmis and McTaggart (1981), John Elliott (1981) and Dave Ebbutt (1983) illustrated graphically for comparison purposes in Hopkins, 1985 (pp.33-39). While each of these models differ in description and emphasis, they all describe a **spiral of action** or series of successive **cycles**. These involve fact-finding and general ideas about an existing problem, **planning** for intervention, **action**, **feed-back** of information, **monitoring** and **reflection** - in a continuous repeatable process.

In as far as the aims of this research project are concerned for **the teachers** and for the **curriculum**, Kemmis' definition of action research justifies it as an appropriate approach:

Action research is trying out an idea in practice with a view to **improving** or **changing something**, trying to have a real effect on the situation. (Kemmis, 1988).

Given the description of the problems in education (as documented in Chapter Two: 2.4.2) the action research design was one way of investigating the relationship between practice and theory. The findings would hopefully contribute to the wider body of research in education.

3.3.7.2 Pros of an action research approach

An action research design seemed particularly appropriate in investigating school based curriculum development for the following reasons:

- The methodology of action research rejects positivist notions of rationality, objectivity and truth which suggest that individuals cannot control the 'reality' of their own situations. It provides a means by which a researcher can interpret 'reality' from the point of view of those acting in the situation under study. In this case it enabled the researcher to gain an understanding of her subjects' worlds and the reality of life in each classroom situation.
- It is collaborative and participatory in nature and allows teachers (in this case) to work with outside facilitators to reflect on their practice, and to generate new knowledge and understanding about their work. It allows them to discuss factors constraining their educational goals and to contribute towards solutions. In this sense it can be described as 'emancipatory' (Stenhouse, 1983; Carr and Kemmis, 1986; Walker, 1990). It is thus empowering to individuals and can lead to improvements and changes in practice. Participants learn to be self-critical in their reflection on the process in which they are involved.

- It provides a flexible framework when working with people over long periods of time. This allows one to adjust and revise plans, research procedures etc, as one goes along in a way that quantitative research methods do not.
- The action research design is one way of investigating the relationship between theory and practice which is particularly relevant in a curriculum development project of this nature.

3.3.7.3 Limitations of action research

- The action research approach has been criticized by some writers for concentrating on practical classroom ideas, 'while wider, structural factors are accepted as unproblematic' (Whitty, cited in Pollard and Tann, 1987: p25).
- The importance of seeing action research in the context of wider social and political issues is discussed by Walker (1990) and its limitations in this regard are highlighted.
- There is also the criticism that 'action research is always biased because it involves the researcher in analyzing his/her own practice' (Carr and Kemmis, 1986: p192). Interpretations are by nature subjective because they are based on values and interests as the objects of inquiry, rather than merely on observed behaviours. Nevertheless action research, coming within the qualitative approach would still, like positivism, aim in its methodology to describe social reality in a neutral and disinterested way. This study was based on the perceptions and responses of teachers in a participatory and interactive project. In order to justify the approach chosen, cognisance was taken of the criteria suggested by Carr and Kemmis (1986)

to ensure that the methodology stands up to the criticisms of more traditional research and meets their quite stringent requirements for 'an educational science'.

- In this study, the researcher was aware of the limitations of the approach as 'action-research' on the level of herself as an 'outsider' or 'university facilitator' being the organiser and presenter at the Workshops. While the opportunities for 'critical self-reflection' were created, the teachers participating in the project did not themselves determine the process, or the choice of Thinking Skills as subject for investigation and innovation.
- Another limitation of action research is that it is very expensive. There is a great investment of time, energy and financial resources in just a few people who may effect very small changes on an individual level without effecting change on a broader scale.
- Action research can be prescriptive (Hopkins, 1985). The concern is expressed that action research models are prescriptive because of the tight specification of process (p40). Hopkins argues that the steps and cycles may 'inhibit independent action' of teachers, but in the view of this researcher there is plenty of scope for individual interpretation and adaptation of the action research design within any of the given models or frameworks. Different aspects of the action research process can be emphasised according to the purposes of the practitioners involved, and freedom of action should therefore not necessarily be constrained in any way.
- Another concern about action-research is that it may impinge on teaching time or 'disrupt the teaching commitment' (Hopkins, 1985). It is argued that the adoption of a new teaching strategy may be less effective than the ones used before. The implication is that this would be unethical. This criticism is rejected here, however,

because the teachers involved in research would be consciously trying to improve both their professional knowledge and the learning experiences of their children.

- A criticism to be taken seriously is that action research lacks methodological rigour and validity. Traditional researchers suggest that methods used may not be sufficiently rigorous when done by practitioners in the classroom. Action-research is sometimes undertaken:

to cover up a lack of knowledge or a willingness to submit one's ideas to the test of hard evidence. (Nisbet, 1980: p6).

In considering such arguments against action research, Hopkins spells out certain criteria for classroom research by teachers (Hopkins, 1985: p41) which if satisfied, validate and legitimize this approach. The validity of action research would rest on criteria such as truth and accuracy of statements, authentic insights and prudent decisions (Kemmis in Keeves, 1988: p46).

Furthermore, the notion of 'case study' is often used as a format for action-research inquiry. This is important as it enables it to 'claim kinship' with anthropological and ethnographic research methods which are established traditions in social science. (Elliot, 1978: a, p356).

3.3.8 'Case study' as a format for action research in this dissertation

3.3.8.1 Features of the case study

Narrative, descriptive style

The methods used in action research are those which 'tell a story' (Elliot, 1978). This author suggests that the 'story' told is called a 'case-study' where the manner of explanation is naturalistic rather than formalistic. The TASC project enabled participants (teachers and this researcher) to get to know each other over a period of eight months. Concrete, rich **descriptions** of relationships and interactions with subjects at each school are recorded in Chapter Four. The method whereby a series of cases is described in depth, therefore, forms the case study design.

Emphasis on process

Millar (1983) suggests that the central task of an educational case study is to investigate and to 'problematise the taken-for-granted practices and rationale that sustain educational institutions.' The emphasis is on the **process** of the investigation and its concern with 'real' events, in a 'real' context and in 'real time' (Millar, 1983). In the case of the TASC project the interest was in the perceptions of the participants themselves, recorded in their own language. The aim was to better understand their views and to take account of all perspectives in the situation. The researcher and the teachers became bound up in a collaborative, participatory venture which afforded both of them the opportunity to reflect on the social processes occurring in classrooms in South Africa at this particular time in history.

Interactive nature

The following methodological principles were kept in mind during the study:

- to attempt to portray and present accurately the 'anatomy' of the case (Millar, 1983) as clearly and honestly as possible
- to be aware of the constantly changing dynamics of the main issues being researched.

Millar (1983) calls this 'progressive focusing.' The interactive nature of the contacts between researcher and participants would constantly throw up new issues or questions which could be probed by interviews or in group discussions at subsequent meetings. This kind of cumulative understanding gained over the course of the project as a whole was seen to be a great advantage of the case study method. However, some problems associated with it are also acknowledged.

3.3.8.2 Some problems related to the case study

While interaction with people helps to give a clearer concept of the important issues, there are also uncertainties. It is often difficult to set and arrange times over a long period. Also, the case study by nature does not enable one to generalise but it does help to dispel misunderstandings about important issues.

As with most qualitative research the issues of subjectivity, rigour and validity can be problematic. With a case study the research style is not as systematic and controlled as in

a quantitative approach because one is dealing with the subjective perceptions of the people who are the subjects (and 'objects') of study.

The main problems outlined by Millar (1983) are those of tending to make coherent what could in fact be conflicts and contradictions observed in the field ('false coherence'). He warns against presenting a 'glib and manipulative document' and gives ways of guarding against distortion of evidence. These problems associated with case study research have already been discussed under the limitations of action research and qualitative methods (3.3.7.3 above).

3.3.8.3 Summary of reasons for choice of design

The reasons for choosing an action-research case-study design arose because of the nature of the educational initiative described as the TASC project. The researcher's role in the project as a curriculum developer meant interacting with participants over a nine month period. In these circumstances an interactive design was viewed as one which would 'increase the responsiveness of the researcher to the problems, issues and work conditions of the subject/s' (Walker, 1985).

An action research design using the case study approach is legitimate as an ethnographic form of research. This was felt to be most suited to an investigation aimed at studying the responses of teachers to a curriculum innovation requiring them to put new theories to work in the traditional classroom. Observations of how this was managed would necessarily

be done after each new input at the workshops, and the chosen approach was therefore deemed the most suitable.

It has been the privilege of this researcher to glimpse from the inside as a participant observer during this study, something of the reality and complexity of the educational practices and circumstances of fellow teachers in the South African situation. The various methods and techniques employed for collecting the data will now be described. These included the keeping of a research diary (field notes), participant observation, focused group discussions, interviews and questionnaires.

3.3.9 Data collection techniques

3.3.9.1 Field notes:

During the course of the study the researcher kept a diary recording all actions and interactions with co-ordinators, participating teachers, the principals and staffs of the five schools and university colleagues where these were involved with the TASC project. The field notes recorded the content of lectures, workshops and classroom lessons as well as any significant observations, tentative interpretations and questions about what had transpired soon after each contact. The researcher reflected on the quality of the data, making notes of any strong emotions, positive or negative, or uneasy feelings that may have arisen during the contact with subjects. On returning from school visits the positive and negative aspects of the interaction were discussed with university colleagues.

3.3.9.2 Field notes and participant observation / advantages and limitations

One of the project's aims was to provide opportunities for net-working between teachers of the racially segregated education departments. The central workshops created this chance for the teachers. The researcher, as the 'facilitator' and presenter of the workshops was in a position to 'set up' contacts with participants on an individual basis. This enabled her to visit each school, observe in the classrooms of each teacher, to model Thinking Skills lessons for the participants where requested and to interview individual teachers on the implementation of the new ideas. The interviewing provided data for reflection and feedback in the action-research cycle. The presence of the researcher as field-worker and participant observer was justified and expected in each of the five participating schools. A relationship of trust and co-operation was gradually built up through the regular contact with each of the subjects. This was made possible by the pre-determined structure of the project which was scheduled to run for most of the academic year. The participants knew what the commitment was from their side, and understood the researcher's intentions for the project and for her own research. These were outlined at the first workshop. These were important factors in being able to observe in the classrooms and so provide a rich account of the different social contexts of each school.

3.3.9.3 Details of time spent in the field.

Six hours of actual teaching were observed in each of three pilot schools over a period of two days. School C only had two teachers participating on the project and these teachers were observed for a double period lesson each. In School D the researcher spent a morning

moving between three teachers' classes. Each setting was very different. The locations, economic background of the pupils, racial mix of children and home languages spoken all differed significantly in each context. On some occasions, the researcher as observer, simply assumed an unobtrusive role in the classroom, 'looked at, listened to and recorded' the teaching and learning activities that went on (Van der Bergh, 1988). In other classes, the researcher felt free to join in some of the activities. She asked questions when appropriate and in some cases was requested to give relevant suggestions. Tea was either provided in the classrooms or was enjoyed in the staff room. Some of the contexts were culturally unfamiliar to the researcher - as described in Chapter Four - the case study.

3.3.9.4 Use of the tape-recorder / observation schedules

In some classes whole lessons were tape-recorded, while in others data was recorded on an observation schedule drawn up for the purposes of the research with specific questions in mind. Care was taken to conduct the note-taking in a way that was 'congruent with the context of the research setting under scrutiny' (Van der Bergh, 1988). The methods of recording also changed during the course of the observation period as the researcher became aware of what worked easily, and what did not. The main object, however, was to accumulate 'rich details' about each setting, about the 'feel' of the school, available resources and facilities, the pupils and teachers, the conversations held as well as the 'feelings and hunches' experienced as an observer (Taylor and Bogdan, 1984).

3.3.9.5 Flexibility

The flexibility of being able to arrange access at mutually agreeable times for the field work was a great advantage. Even though the historical first democratic election in the country held in April, fell in the middle of the term's programme, and disrupted school activities quite significantly in some Departments, the researcher was still able to re-negotiate times and fulfil obligations. Where tension undoubtedly existed at that time, the flexibility of field work as a method of research proved an advantage over other possible methods, which might have been difficult in the given circumstances.

An anticipated difficulty of the role of observer in many of the classrooms was the 'whiteness' of the researcher. If one considers the politics in education in the apartheid regime, most white visitors to black schools would have been inspectors. Teachers could therefore have been defensive and resentful, or felt that they were being judgementally observed. Black, Coloured and Indian pupils would rarely have had white visitors to their schools, let alone in their classes. The researcher was aware, therefore, of the effects of her presence in these schools as a factor that could obscure the reality, especially when compared with her presence in School D where she would be regarded simply as 'another teacher'.

3.3.9.6 Limited scale of the sample

Another limitation felt in this regard was one which Giddens (1989) mentions in the Chapter 'Working with Sociology: Methods of Research'. Only small groups can be

studied at a time. In this case, the research focused on only five schools, with a limited number of subjects. The time and energy invested was significant, yet the realisation is strong that very few teachers and pupils would benefit from it. However, this kind of field work does allow a researcher to come to grips with some of the complexity of education, schools and schooling and to gain valuable insight into factors militating against better teaching and learning as described in Chapter Two. Though limited in scale, the case study does contribute to an understanding of social reality within the whole body of educational research.

In this study the complementary technique of **focused group discussions** at the Workshops together with descriptions of follow-up **interviews** with individual subjects further contributed to the data base. **Group discussions, questionnaires and semi-structured interviews** were also used as adjuncts to participant observation thus 'bringing into play a number of data gathering methods'. (Bryman, 1988).

3.3.9.7 Focused group discussions and interviews

Both these techniques were used in the research as they are interactive. Conducted in personal contact situations, they can more flexibly probe the perceptions, thoughts and attitudes of subjects than the more formal survey or questionnaire. Another reason for choosing these methods was that they did not require written responses and interpretations, which could have inhibited some of the teachers for whom English is a second language. Meanings and understandings could thus be negotiated and clarified.

Focused group discussions

At the first Workshop participants worked in their school groups and were asked to respond to questions about problems in education, in teaching, and in their classrooms. They were asked to identify particular needs and expectations for themselves, for their pupils and for the curriculum. The teachers worked collaboratively and reported back the findings of the group. This information supplied the researcher with a clearer understanding of the different situational contexts from which each school came. A useful analysis comparing perceptions across education Departments was done. This was similar to the 'situational analysis' and 'goals' which form the first two stages of Skilbeck's school based curriculum development model cited in Gordon (1981). These focused interviews (Merton and Kendall, in Hustler, Cassidy and Cuff, 1986: p109) were used at all the following workshops and became part of the research design. (The composition of the groups changed after the first Workshop, and was subsequently a deliberate mix of participants: one representative from each school formed a group.) Thus themes emerging from the interaction with the teachers on school visits and at the Workshops formed the focus of subsequent interview questions.

3.3.9.8 Interviews

The **semi-structured interview** used in groups (Bryman, 1988) was followed by individual interviews with each subject (McKernan, 1991). All interviewees were asked a basic set of questions relevant to the research investigation, but other issues were sometimes raised during these interviews, occurring naturally in the discussion. This was seen to be an advantage over the **structured interview** where little deviation occurs. Richer material is

provided while not being as time-consuming as the 'rambling' of the **unstructured interview** (Bryman, 1988: p46). The latter, however, was used with school **principals** who thus had the freedom to raise issues and questions of importance and relevance to themselves as school heads, instead of being restricted to issues of interest to the researcher.

The subjects interviewed, how they were interviewed and at what stage of the project are as follows:

- School A** : 1 male, 2 females (not taped, but notes taken during interviews; Phase Two)
- School B** : 1 male (taped interview: Phase One); 1 female (telephone interview - as she had to get back to a young family: Phase One)
- School C** : 2 male teachers (taped: interviewed individually during Phase One; a combined, taped interview in Phase Three)
- School D** : 3 female teachers (all taped) Teacher One in Phase One; others in Phase Three
- School E** : 1 male, 2 female teachers (all taped during Phase Three)

All tape-recorded interviews were fully transcribed. All **principals** except that of School B were interviewed ('informal conversation type' or 'in-depth interview' (Schurink, 1988: p139) either on the occasion of the school visits or in the case of School D on two separate occasions. The tape-recorder was not used during these interviews. (These contacts were particularly important for establishing relationships of trust, seeing that the researcher was to be in and out of their schools during the course of the year). Interviewing at least two teachers from the same school offered an opportunity for triangulation in that data from both respondents could be compared and analyzed for plausibility (Kelchtermans and Vandenberghe, 1994) while also giving complementary data about the school context. Being able to interview some teachers soon after the first Workshop helped with planning and adapting (first action research cycle) while later interviews meant that teachers had had time to implement the Thinking Skills, reflect on difficulties, adapt with feed-back and try again. The fact that subjects were asked similar questions during group discussions as well, meant that they were aware of important aspects of the methodology and were able to give informed responses by Phase Three. The flexibility of the research design was thus an advantage.

3.3.9.9 Questionnaires

An **open-ended questionnaire** (Hopkins, 1980) was administered to the teachers at the second centralised Workshop. It could also be described as a '**group administered questionnaire**' (McKernan, 1991: p127).

As the project was a school based curriculum development initiative, the researcher needed to gain some idea of the participants' notions of 'curriculum' and their perception of themselves as 'change-agents.' The first group discussion had already addressed their expectations of TASC for the curriculum and for themselves, so a questionnaire was devised for the second workshop to assess briefly the following:

- what the word 'curriculum' meant to them
- whether they felt able to influence the curriculum and if they felt they were, how this could be done
- how they would like to see the curriculum change

This was anticipated to be a quick, easy way of obtaining the information, which it was, but the researcher regretted having used this method for various reasons:

- the teachers immediately felt threatened and self-conscious (especially those who were not English-speaking and who did not feel confident in writing and spelling)
- the exercise was contrary to the flavour and interactive rapport that had been established.

The researcher, in fact, felt guilty of 'testing' her subjects in what to them was an unexpected move.

However, the responses did reveal significant insights into the attitudes and feelings of the teachers towards schooling. The issue was not probed any further by means of interviews but was merely used to help the researcher know what emphasis to place on the role of the teacher in curriculum development when preparing subsequent presentations of TASC.

A mailed 'opinionnaire' (Oppenheim, in Hopkins, 1980) was sent to participants after the final Workshop in August, and was used to assess the impact of the project as a whole. It took the form of a personal letter enclosing a hand-out requested by participants at the last Workshop. It simply invited a response to the project and gave the teachers an opportunity to reflect on their practice (as part of the action research spiral) after the impetus of continued contact was over. It was open-ended with no prompts or questions: it invited subjects to respond by returning the 'letter' or telephoning if they so wished. There was little guarantee that teachers would respond, and no follow-up phone-calls were made. The response is recorded in Chapter Four, Phase Four.

3.3.10 Triangulation

Triangulation may be defined as the use of two or more methods of data collection in the study of some aspect of human behaviour (Cohen and Manion, 1989: p269). McKernan (1991) refers to this as 'methodological triangulation' (p 193). The use of field notes, participant observation and interviewing would constitute triangulation in this study as the combination of these techniques enabled the researcher to see the project from different models or perspectives.

In addition, observers at the Workshops (usually one or two members of the Inter-Departmental Network Committee who were also subject advisers) recorded their impressions for reports on the project in local publications. These observers were asked to give their comments. Examples of such reports are included in Appendix 8.

The tape-recorded interviews with their transcriptions were made available to a university colleague for verification of accuracy (transparency).

Obtaining a number of perspectives, in this way, from various actors within the research setting would serve as triangulation, according to contemporary action-researchers (McKernan, 1991: p189).

3.3.11 Analysis of data

Field notes recorded actions, interactions, observations and impressions gained both during the Workshops and at each school. Significant interpretations were made while in the field by marking these as 'observer's comments' [O.C.]. (Bogdan and Biklen, 1992). In this way relevant points were recorded which were vitally important in the action research planning cycles. Feedback could be individualised and given at each new contact with a subject or group of subjects. This was a mode of analysis that was concurrent with on-going data collection based on reflecting while in the field (Bogdan and Biklen, 1992) and was written up at each Phase of the project. For example the Comparison Grid was drawn up immediately after the first Workshop. This analysis then informed all preparations and adaptations for each school visit. A retrospective analysis of the action research cycles and spirals was done at the end of the project to illustrate the interactions and developments from the points of view of both the researcher and her subjects. These were designed to be used as overhead transparencies to represent a possible model for school based curriculum development. Forward planners, time-order frames and grids were used to clarify the processes and chronological interactions that took place.

3.3.12 Summary and Conclusion

This chapter reviewed the literature on school based curriculum development in order to present a perspective within which the TASC project could be considered as a framework for initiating change in schools and schooling. Reasons for choosing Workshops as the mechanism or vehicle for presenting the Thinking Skills and TASC methodology to teachers were given. The pattern of Workshops held in a central venue, followed by staff workshops or lectures 'on site' at each participating school was described as the format for this school based curriculum initiative. The background to the study was sketched and the reasons for the research given.


It was felt that qualitative methods would be best suited to the research investigation, dealing as it does with the perceptions and subjective responses of teachers to the introduction of Thinking Skills in the classroom. An action-research/case-study design was chosen as the framework within which the research would be conducted and data collected. This was influenced by the interactive nature of the TASC project as a form of reflective inquiry (McKernan, 1991). The researcher was to be involved with her subjects over a period of eight to nine months.

The data collection techniques to be employed were described, considering the advantages and limitations of each. These included the use of participant observation, semi-structured interviews, focused group discussions, questionnaires and extensive field notes providing a rich description of the educational settings under investigation. Methods of triangulation were also described.

Because the research study focuses on teachers' perceptions about schooling and their own part in it, the chosen design and methodology outlined above is considered justifiable.

By learning the perspectives of the participants, qualitative research illuminates the inner dynamics of situations - dynamics that are often invisible to the outsider. (Bogden and Biklen, 1992: p97).

The researcher's concern was always that the process be more important than the product and that attention be paid to the knowledge gained by the articulation of teachers' tacit theories arising out of reflection on their practice in their particular natural settings. It is this that the study hopes to describe in the next chapter.



CHAPTER 4**DESCRIPTION OF THE TASC PROJECT: CONCURRENT ANALYSIS OF
IMPRESSIONS, INTERPRETATIONS AND CONCLUSIONS**

On the following page a time-order frame illustrates the contacts and interactions between researcher and subjects.

In addition, a 'forward planner' can be found at the beginning of each of the four phases of the project. These serve both as advance organisers and as summaries, and allow the reader to see at a glance how each section of Chapter Four was analyzed.



(Pupil from School E fetching water from a hand pump
in the school grounds)

**TIME-ORDER FRAME OF CONTACTS AND INTERACTIONS BETWEEN RESEARCHER AND SUBJECTS
TASC PROJECT**

	PHASE ONE				PHASE TWO			PHASE THREE		PHASE FOUR		
SCHOOL A	TASC information meeting	Workshop 1 08:30 – 15:30	Staff Workshop 13:00 – 14:30	Classroom observation Std 2 Eng Std 3 Eng Std 4 Eng Std 5 Eng	Workshop 2 12:30 – 15:30	Observation Std 4 Maths Std 3 Eng Interviews – principal, Teachers 1 & 2 ¹	Observation Std 5 Eng Std 4 R.E. Interviews – Teachers 3 & 4	Workshop 3 12:00 – 15:30	Staff Workshop 13:00 – 14:30	Workshop 4 12:30 – 15:30	–	Letter sent inviting “reflection”
	19 Nov 1993	28 Jan 1994	17 Feb	11 March	16 March	26 May	27 May	8 June	18 August	24 August		29 Sept
SCHOOL B	TASC information meeting	Workshop 1 08:30 – 15:30	Staff Workshop 13:00 – 14:30	Interview 13:00 – 13:15 Teacher 1	Workshop 2 12:30 – 15:30	Thinking Skills Observations 09:00 – 12:30 Std 5 Geog Interview Std 5 Science Teachers 2 & 3 Std 5 Health/Eng Staff Workshop 13:00 – 14:00		Workshop 3 12:00 – 15:30	–	Workshop 4 12:30 – 15:30	–	Letter sent inviting “reflection”
	19 Nov 1993	28 Jan 1994	15 February		16 March	2 June		8 June		24 August		29 Sept
SCHOOL C	TASC information meeting	Workshop 1 08:30 – 15:30	Staff Lecture 12:00 – 12:30 Interview Teacher 1	Unstructured interview with principal Interview Teacher 2	Workshop 2 12:30 – 15:30	– All proposed visits cancelled		Workshop 3 12:00 – 15:30	Thinking Skills Observation Std 5 Geog Std 5 Science 10:00 – 12:30 Interviews Teachers 1 & 2 and principal	Workshop 4 12:30 – 15:30	–	Letter sent inviting “reflection”
	19 Nov 1993	28 Jan 1994	9 Feb	10 Feb	16 March			8 June	28 July	24 August		29 Sept
SCHOOL D	TASC information meeting	Workshop 1 08:30 – 15:30	Interview Teacher 1	Observation Std 4 M Modelling of Thinking Skills lesson to Std 4 X (Teacher 1's class)	Workshop 2 12:30 – 15:30	– (Telephone contact with Teacher 2 18 May)		Workshop 3 12:00 – 15:30	Interview with principal Observation CI ii Thinking Skills Std 3 Eng Interviews with Teachers 2 & 3 09:00 – 12:30	Workshop 4 12:30 – 15:30	Staff lecture 14:15 – 15:00	Letter sent inviting “reflection”
	19 Nov 1993	28 Jan 1994	8 Feb	16 & 23 Feb	16 March			8 June	4 and 9 August	24 August	16 Sept	29 Sept

	PHASE ONE				PHASE TWO			PHASE THREE			PHASE FOUR	
SCHOOL	TASC information meeting	Workshop 1 08:30 – 15:30	Staff Workshop 13:00 – 14:30	Observation Std 2 Eng Std 3 Eng Std 5 Eng SSB ENG 09:00 – 10:00	Workshop 2 12:30 – 15:30	20 April – Visit cancelled (Election tension) 25 May – Visit cancelled (Pay-day for teachers) 3 June – Visit cancelled (Stock-taking)	Workshop 3 12:00 – 15:30	Interview with principal Observation Taped lessons 11:30 – 13:00 Teachers 1 & 3	Observation and interview Teachers 2 & 4 09:00 – 12:00 Staff Workshop 12:30 – 13:30	Workshop 4 12:30 – 15:30	Letter sent inviting “reflection”	
	19 Nov 1993	28 Jan 1994	8 Feb	2 March	16 March		8 June	26 July	2 August	24 August	29 Sept	

4.1 Introduction

This chapter describes how the project came about and how it was conducted. The researcher documents how and when the data for the study was collected, and interprets it holistically within the framework of an action research design as described in Chapter Three. The content of the first introductory lecture given to all participants outlines the TASC theoretical framework. The description of how the project was implemented in Four Phases over a nine month period follows. Impressions gained during the case studies are recorded and data interpreted at each step. An analysis of the issues central to the research question is attempted simultaneously in this chapter, rather than in a chapter of its own.

Background to the project

The preliminary discussions and choice of TASC as a framework for the introduction of Thinking Skills in the primary curriculum had already been confirmed by the Network Committee (See 3.3.1 above and Appendix 1) as one of their projects for 1994. It was to be a collaborative venture between a pilot school from each of the five then-existing Education Departments, and the Curriculum Development Unit of the University of Natal, who would train the teachers in Thinking Skills and their application, using the TASC framework.

4.1.1 First introductory lecture: The TASC ('Thinking Actively in a Social Context') framework - rationale, aims and the teaching principles

The first introductory lecture was held at the Natal College of Education on the 19

November 1993. Present were inspectors, subject advisers, principles and teachers from each of the five pilot schools.

Belle Wallace outlined the theory and rationale of the 'Thinking Actively in a Social Context' model (referred to hereafter as TASC). The issues of 'how teachers best teach' and 'how children best learn' were addressed in her presentation of the principles of the TASC methodology, and of current theories of intelligence, learning and motivation. The following synopsis is given:

Rationale

The TASC framework is an eclectic one derived from a belief that people's **thinking and potential to learn can be improved/increased** with practice. The influence of theorists such as Sternberg, Vygotsky, Borkowski, Bandura and others was acknowledged as having been enormously significant in the development of the TASC model (Wallace & Adams, 1993). Children should be **active participants** in the learning process, not passive vessels to be filled with facts. Children (and adults) learn better when they work collaboratively **in social interaction** with one another, while the **context** in which they work according to Wallace, must be taken into consideration. What they learn must be **relevant and meaningful**.

Aims

The **aims** of TASC focus on **pupil development**, the skills of the **teacher** and on **curriculum development** (see Appendix 3) .

Some of the aims for the **pupil** include:

- maximising the ability to make sense of and to learn from experience (i.e. to *learn how to learn*)
- giving constant attention to the self-concept of the learners so that they view themselves as **capable**, independent decision-makers and problem-solvers (Wallace and Adams, 1993: p9).

For the **teacher**, the following are stressed:

- a change of role to that of facilitator of learning rather than merely dispenser of knowledge
- development of skills within an enquiry-based, information-processing paradigm : skills would include the teaching and training of Thinking Skills and Problem-Solving strategies; managing group work, co-operative planning and sharing of goals

The TASC project would aim to effect long term re-structuring of the **curriculum** through teachers making small, incremental changes in the pursuit of goals and visions: these relate to making the content of syllabuses (and all learning) more relevant; relating learning to practical and real-world experiences; explicitly teaching basic problem-solving skills and strategies that **transfer** to issues in every day life (Wallace and Adams, 1993: p12).

The Ten TASC Teaching Principles

The Ten TASC Teaching Principles to which the participants in the project would be

exposed were outlined as follows:

- Adopt a model of the problem-solving process and explicitly teach this
- Identify a set of specific **Basic Thinking Skills and Thinking Tools** and give training in these
- Develop a vocabulary to suit the learner
- Give ample practice in both the **Basic Skills and the Thinking Tools**
- Give attention to the motivational aspects of problem-solving
- The progression of teaching is from modelling by the teacher to guided activity by the learner, and eventually autonomous action by the learner
- Every effort must be made to enable the learner to transfer Basic Skills and Thinking Tools to new contexts
- The emphasis is on co-operative learning in small groups
- Teachers should encourage pupils self-monitoring and self-evaluation
- Students should be encouraged to develop their metacognitive knowledge

TASC had been chosen by the Network Committee as a justifiable model for the teaching of Thinking Skills and one which could contribute to school based curriculum development (Mathfield, 1992). The schools were congratulated for having been chosen for the project.

The meeting ended with the date of the first TASC Workshop for teachers set for the 24th January 1994. The researcher who had completed the first year of course work for the Masters Degree in Education (Curriculum Development - Thinking Skills & Problem-Solving) was introduced as the University's representative appointed to run the Workshops and to be responsible for the curriculum innovation on a school-based level in the five pilot

schools.

The time-order frame of contacts and interactions between the researcher and subjects at the beginning of this Chapter gives an overview of the Four Phases of the TASC Project as it was conducted. The time frames were as follows:

Phase One	:	January, 1994 - mid-March, 1994
Phase Two	:	Mid-March, 1994 - end of May, 1994
Phase Three	:	June, 1994 - mid-August, 1994
Phase Four	:	Mid-August - end of September, 1994

Each Phase followed a set pattern and is recorded in the following order:

- Description of the centralised Workshop attended by teachers representing each school. (A Workshop initiated each new phase).
- Description of the follow-up visits to each school and the researcher's interaction with principals, other staff members and the TASC delegates. These contacts were through interviews, lectures, staff workshops or observation in the classroom
- Summary of observations, impressions and interpretations relating to each school
- Overall summary of the whole Phase.

4.1.2 The centralised workshops

These were held at the Natal College of Education in Pietermaritzburg. The venue was made available by the Natal Education Department and organised by the Inter-Departmental Network Committee for the Natal-KwaZulu region.

A member of this committee was present at each Workshop to welcome the delegates and to participate or observe proceedings. (This was a useful form of triangulation in the action-research design). The researcher presented each Workshop, assisted by Belle Wallace, author of TASC and Director of the Curriculum Development Unit of the University of Natal, Pietermaritzburg. The length of the Workshops varied between three hours and five-and-a-half hours.

Theory into practice

Certain aspects of the TASC theoretical model were presented at each Workshop followed by practical application of the **Basic Thinking Skills or Tools for Effective Thinking** that had been introduced. This involved working in small groups, practising the new skills, sharing ideas and planning collaboratively. TASC was presented as a **framework** around which Thinking Skills programmes could be devised. The underlying assumptions, rationale and methodology of TASC were explained or revised on each occasion highlighting the influence of modern theories of teaching, learning and intelligence on its development. Delegates were always reminded of the **aims** of TASC: for teachers, for pupils and for the curriculum.

Teachers, working in either subject or standard groups, would explore ways in which the Thinking Skills and Tools described could be applied in their content subjects and with their classes. Time for **reflection** was an important part of each session.

4.1.3 Planning for school visits

Although arrangements for school visits were not made at the Workshops, the delegates were told what the researcher's plans for these would be. The principals would be contacted for permission to visit each school; to observe in the classrooms generally; to speak to the staff about the TASC project; and to either teach or observe carefully prepared Thinking Skills lessons. The researcher would facilitate discussion between the TASC delegates and their colleagues by arranging staff workshops at each school. The delegates thus had the opportunity of going back to their classes, of trying out Thinking Skills and of being able to report on these to fellow members of staff with the researcher facilitating the discussions. In this way the whole base of the curriculum initiative was broadened and awareness of the project devolved to non-delegates.

The quality and degree of interaction between the researcher and each school obviously differed according to the context and administration of each school, but the overall pattern of centralised Workshop followed by school visits, continued in a cyclical way through-out the Four Phases. It is a description of the contents of the Workshops and the researcher's interactions with the participants in the context of their own school settings, that forms the content of this chapter.

A forward planner for Phase One follows.

FORWARD PLANNER: PHASE 1

SCHOOL	NOV 1993	JANUARY 28 FIRST WORKSHOP All Schools	FOLLOW-UP SCHOOL VISITS	ANALYSIS: Impressions and Interpretations	WHERE ARE WE GOING?
A	INTRODUCTORY LECTURE ON THE PROPOSED TASC PROJECT	At Natal College of Education 8.30 Registration/Welcomes Group discussion: Problems in Education	<i>17 February</i> A 13:00 – 14:30 Staff workshop on TASC Group discussion: problems identified at Workshop 1 Modelling the Thinking Tool Brainstorming <i>11 March</i> 8:30 – 12:30 Observation in four classes	Summary for School A	Overall summary of emerging themes and Comparison Analysis of “problems”, “help required” and “perceptions and expectations of TASC” First Action Research Step * Formulating the general idea * Fact-finding exercise – understanding the contexts * Planning how we are going to work – establishing time-order frames Second Action Research Step * Introducing the Thinking Skills * Meet other members of staff at the schools
B		<i>Session 1</i> Assessment of needs Overview of TASC theoretical model 10:30 – 11:00 Tea 11:10 Some thinking skills	<i>15 February</i> B Staff workshop on TASC Group discussion arising out of problem identification at Workshop 1 Modelling the Thinking Tool Brainstorming Interview with Teacher 1	Summary for School B	
C		<i>Session 2</i> Introducing the Thinking Skills Exercises: How to – Brainstorm Use key words Know direction	<i>9 and 10 February</i> C Interviews – Teachers 1 and 2; Interview – Principal Staff lecture on TASC 12:00 – 12:45 Brainstorming problems Modelling the Thinking Tool Brainstorming and probing problems	Summary for School C	
D		<i>Session 3</i> 12:30 – 13:30 Lunch 13:30 Relating skills to school subject/content areas “Bridging” into the curriculum	<i>8 February</i> D 15:30 Interview with Teacher 1 as follow-up to workshop <i>16 February</i> Observation: Std 4 M Modelling of a Thinking Skills lesson – Std 4X Metacognition <i>23 February</i> Divergent Thinking Lesson	Summary for School D	
E		15:30 Reflecting on the process (5½ hours)	<i>8 February</i> E Staff workshop: Brainstorming as a Thinking Tool Group discussion of problems <i>2 March</i> 09:00 – 12:00 Observation in four classes	Summary for School E	

4.2 PHASE I

Workshop 1 - 24th January 1994.

This was a 5 1/2 hour Workshop which was attended by the following people :

- The researcher and Belle Wallace of the Curriculum Development Unit, University of Natal.
- Two Representatives from the Environmental Education Initiative.
- Two members of The Network Committee / Subject Advisers in the Natal Education Department
- A Senior Lecturer from Umbumbulu Teachers' Training College.
- Seven teachers from a private girls' school, including the Headmistress. (This school was not one of the pilot schools, and did not attend further workshops.)
- 18 Teachers from the five pilot schools :
 - 9 Black Teachers (Kwa-Zulu and D.E.T.)
 - 2 Coloured Teachers (House of Representatives)
 - 4 Indian Teachers (House of Delegates)
 - 3 White Teachers (Natal Education Department - House of Assembly)

4.2.1 WORKSHOP 1 : Session I

Delegates were welcomed to the Workshop by the Chairman of the Network Committee. For many participants this was the first opportunity they had had of meeting professionally across colour lines. With people segregated by law, teachers in South Africa have been restricted for the most part to teaching within their own culturally determined education

Departments.

Group discussion: Four points to consider

The Session started with the participants working in their school groups. Each group was presented with a large sheet of newsprint, coloured pens and four points for discussion. They were asked to consider and record in keywords (with a note-taker recording ideas) the following points :

1. PROBLEMS : any problems experienced in the teaching of their particular subjects
2. HELP : any help they needed (they were to state areas of need)
3. PERCEPTIONS : their perceptions, at that point, of TASC and what it was all about
4. EXPECTATIONS : their expectations, as participants
 - for themselves, as teachers
 - for their pupils
 - for the curriculum.

One member of each group was required to report back to the whole gathering. Each spokesperson gave one point. There was to be no repetition of points in the report-backs. These were all recorded on the board as a reflection of the participants' views as a group. (Each school's chart was, however, collected. The views were summarised and compared for the purposes of the research. The Comparison Analysis Grids and summaries for each school can be found in Appendix 2).

4.2.1.1 Analysis of issues arising from the group discussion

In analysing the problems in education as expressed at the workshops and as observed in the schools, it was inevitable that comparisons would be made along racial lines in some instances: the sites and subjects for the project were drawn from five segregated education departments that have operated separately from one another for decades under apartheid structures. One of the aims of the project was to overcome racial divisions through interaction. Where contrasts are drawn on apparently racial lines, therefore, it is in the interests of illuminating the context of the research against the background of inherited historical and political educational structures and not because of any personal bias on the part of the researcher.

Situational Analysis

1. Problems

The points arising from this first group discussion were important to the researcher as it gave her an idea of the problems perceived and felt by participants. It provided the facts for a 'situational analysis' along the lines of Skilbeck's SBCD model (Marsh, 1988) or Lawton's Cultural Analysis Model - (Gordon (ed), 1981) highlighting the fact that the social context of the teachers has to be taken into account - particularly in the South African situation where educational provision has been unequal and discriminatory and where the political structures of apartheid society have created vast differences in the quality of teacher training and schooling. These factors have influenced the way the curriculum is perceived by different teachers, which is an important point in this study. The importance of understanding what has happened in the past cannot be underestimated

when planning curriculum changes for the future. This preliminary exercise helped prepare the researcher for what to expect when visiting the schools (e.g. no electricity in School E). From the point of view of the participants, it gave them the opportunity to share frustrations and hopes about their work with fellow-professionals and to identify needs.

A problem common to all participants was that of children learning and communicating in a second language, but the degree to which this was problematic ranged from all children (in black schools to just a few, in white schools and increasing numbers in Coloured and Indian Schools, since the admissions policy changed with the Model C option). SIZE of classes was also a problem common to all except the private school. Some of the problems identified were :

- cultural differences between pupils
- lack of facilities/material resources/teaching aids and equipment
- differing abilities of children
- lack of relevance of subject matter/poor quality text books
- time-table constraints/lack of time
- parental expectations
- lack of parental involvement
- parental sensitivity to certain school topics (subjects)
- teaching loads
- expectations of superiors
- sense of isolation
- poor home backgrounds of many pupils

The participants were thus able to listen to the main problems of each cultural group which gave insight into the differences in educational provision and how these differences have affected teaching and learning. An opportunity to expand on these problems would be given at each school workshop.

It is worth noting here that during the report-back on 'problems' there were feelings of acute embarrassment on the part of most white teachers (from the private school and the NED) at the realisation that they had to look for problems - compared with the teachers from the other education Departments who had so many to enumerate.

2. Help

The categories of 'help' required by the teachers can be briefly summarised as follows :

- help with the provision of apparatus, laboratories, libraries, text books and teaching aids
- help with the up-grading of teaching skills : time-management, communication skills, more effective assessment, better questioning techniques, better classroom management.
- personal help : the need to develop self- confidence, self esteem, better communication skills
- need for more contact with others / networking inservice training, sharing of ideas

The extent to which any or some of these needs were met by the TASC project will be discussed in the final analysis in Chapter Five. At the planning stage of the project it was valuable to understand what aspects of TASC were likely to go furthest in meeting the

needs expressed here.

3. and 4. Perceptions and Expectations

The third and fourth questions put to the groups tried to assess what the participants had understood of the first introductory lecture on TASC, and what they were hoping to gain from their participation in the project.

Most of the teachers expressed a desire to find out more about the 'how' of teaching children to think. They anticipated learning 'new methods' for enabling children to be more active learners, and for becoming better facilitators of learning themselves.

They were looking for something to empower them as teachers - to help them 'solve some problems in education'. They hoped that the introduction of Thinking Skills in the curriculum would lead to more child-centred learning, greater motivation, creativity and independence on the part of the pupils, and to more relevance as far as the subject matter in the curriculum was concerned (see Comparison Grid - Appendix 2).

The group discussion was important in the following ways:

- It gave the participants a taste of the kind of collaborative learning and sharing of ideas in small groups that would characterise all future Workshops (i.e. working within the TASC methodological framework).
- It gave the researcher insight into the problems facing the teachers in their day-to-day work, and of their understanding of, and expectations for the project. This was invaluable as a starting point for all further planning.

- It gave both participants and researcher a better understanding of the commonalities and differences amongst themselves professionally and contextually.

4.2.2 Workshop 1 : Session 2

In this part of the Workshop the researcher, as presenter, used the overhead projector to explain graphically the 'Three Tier' TASC model (see figure 1). Anyone using TASC as a framework for teaching Thinking Skills has outlined for them the following :

- The **Basic Thinking Skills**.
- The **Tools for Effective Thinking** and
- A **Problem Solving Model**

4.2.2.1 Basic Thinking Skills (See figure 2)

There are four aspects that are important here :

- knowledge components
- metacognitive aspects
- skills and processes and
- attitudes and motivation

One of the main objectives in any Thinking Skills programme is to teach children to 'think about their thinking'. This monitoring of thinking processes must therefore start with the teachers themselves.

BASIC THINKING SKILLS

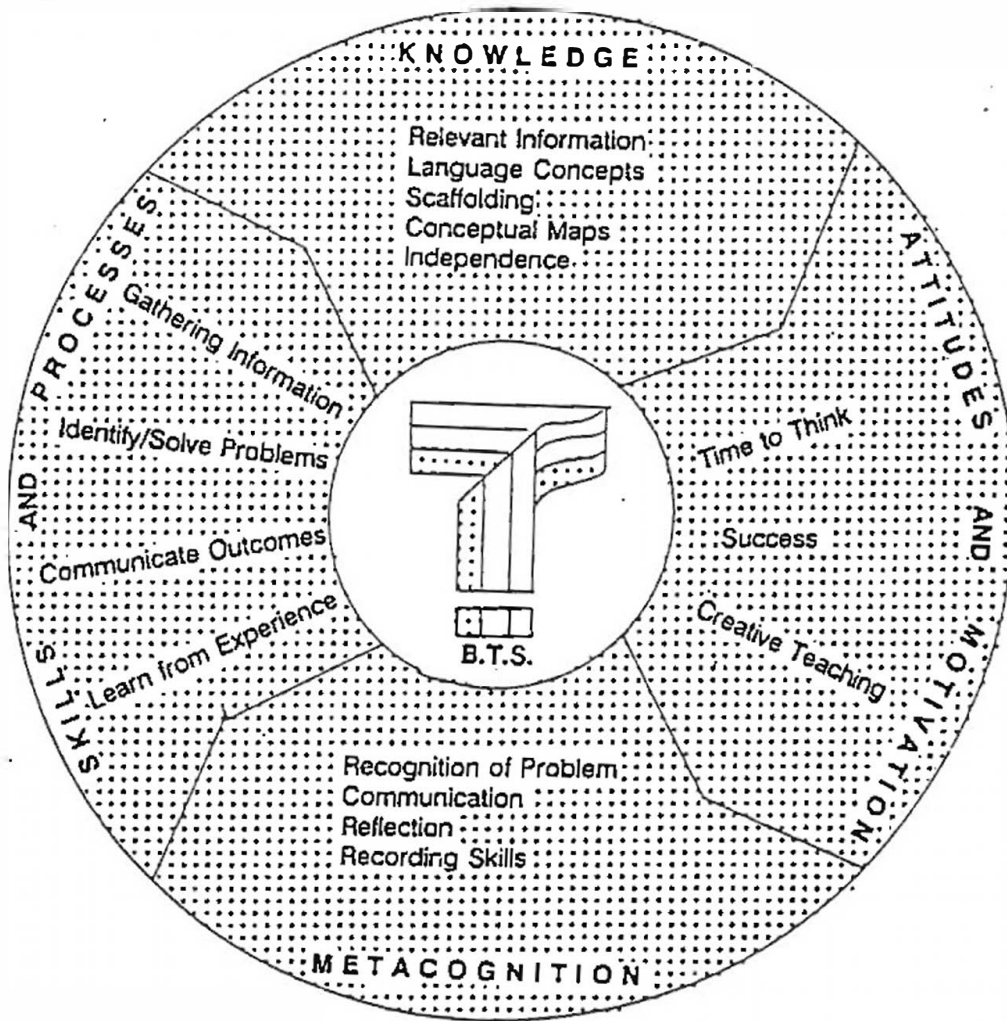


figure 2

Throughout the Workshops the participants were encouraged to ask these types of questions after an activity or discussion :

- How have we worked together ?
- What have we learned about ourselves ?
- What have we learned about our thinking ?
- Could we have done it differently/in a better way?

Working in
groups 4.5

This attention to **metacognition** and to **attitudes and motivation** in the TASC model aims to encourage reflection and build self-esteem in the learners. Negotiating and clarifying meanings and working co-operatively in small groups is characteristic of the TASC methodology. The **modelling** of this kind of thinking is one of the 10 important TASC teaching principles. The '**knowledge**' and '**skills and processes**' aspects include the acquisition of new concepts, labelling of objects, learning new vocabulary, noticing details, and comparing (looking for similarities and differences) when teaching new content. Thinking cannot occur in a vacuum and teachers were shown how to integrate the **Basic Thinking Skills**, with their normal teaching programmes. The theme of the environment was used as the focus or content upon which the skills would be superimposed. Another principle applied was that the Thinking Skills would be identified, made explicit and deliberately taught. Developing a vocabulary to suit the learner and teaching children how to ask questions appropriate to subject content, were skills the teachers were to learn during the course of the project. They would also be trained to encourage their pupils to monitor their own thinking in the same way as they were doing on the course, and to **teach for transfer**.

4.2.2.2 The Tools for Effective Thinking (See figure 3)

These are outlined in the TASC model and were presented to the participants on overhead transparencies.

There is no hierarchical order of teaching these skills and procedures but the authors of TASC (Wallace & Adams 1993) identify the 'thinking tools' that are most useful and practical in school learning. To equip children and adults with a repertoire of different 'thinking tools' is to help them become independent, autonomous thinkers. Thus in the Workshops the teachers were given practice in using the various **Tools for Effective Thinking**. That different types of thinking are demanded in different situations is also explained in the TASC model. The teachers were to be presented with real-life problem situations in order to practise the tools of **Brainstorming** (for divergent thinking), **Other Peoples' Views**, **Pros and Cons**, **Considering Consequences**, etc. (See figure 4)

4.2.2.3 The Problem Solving Wheel (See figure 5)

This was also presented, though not dealt with in detail at this stage. Teachers were shown simply, that **Basic Thinking Skills** or **Thinking Tools**, learnt separately, could then be utilized in any given problem-situation. Problem-solving thus demands flexibility in choosing the right kind of thinking for the task or situation at hand.

EFFECTIVE THINKING TOOLS

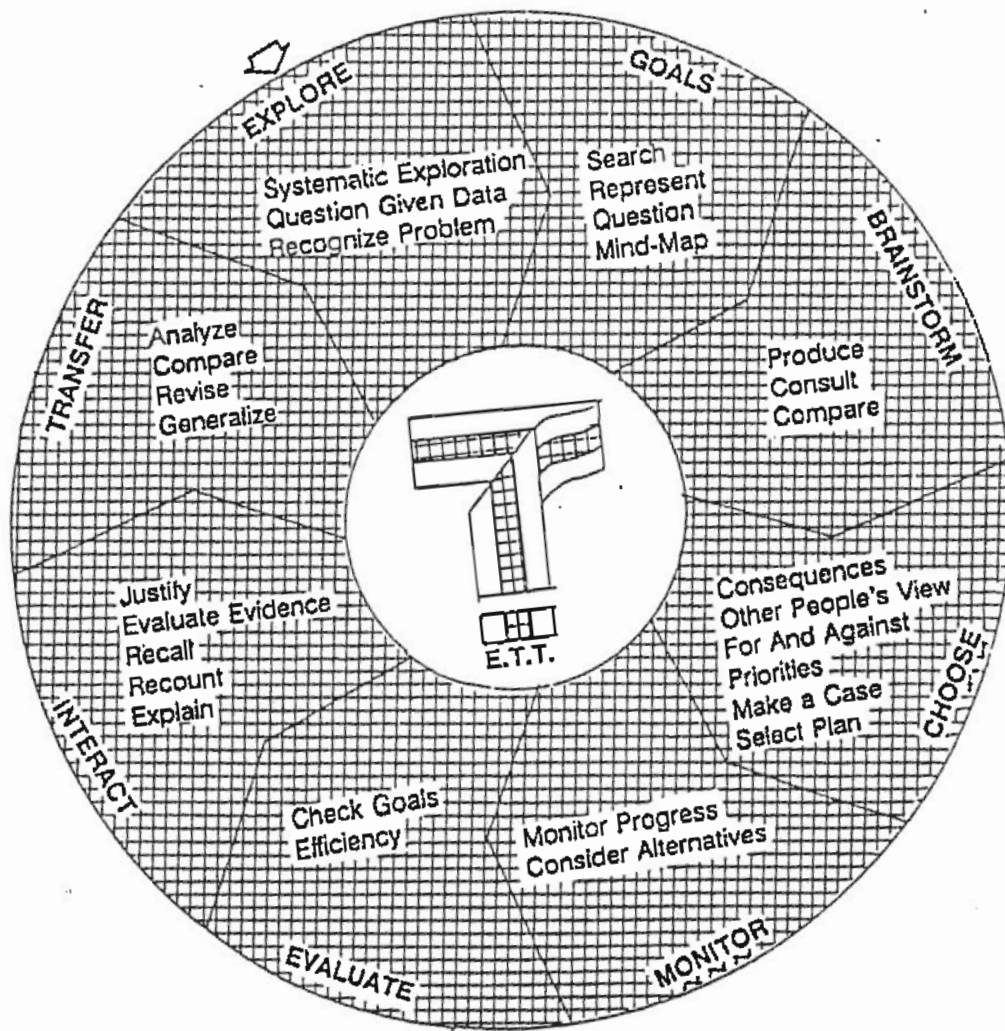


figure 3

We can practise thinking

Here are some examples of the tools that can be used with the TASC Problem-Solving model.

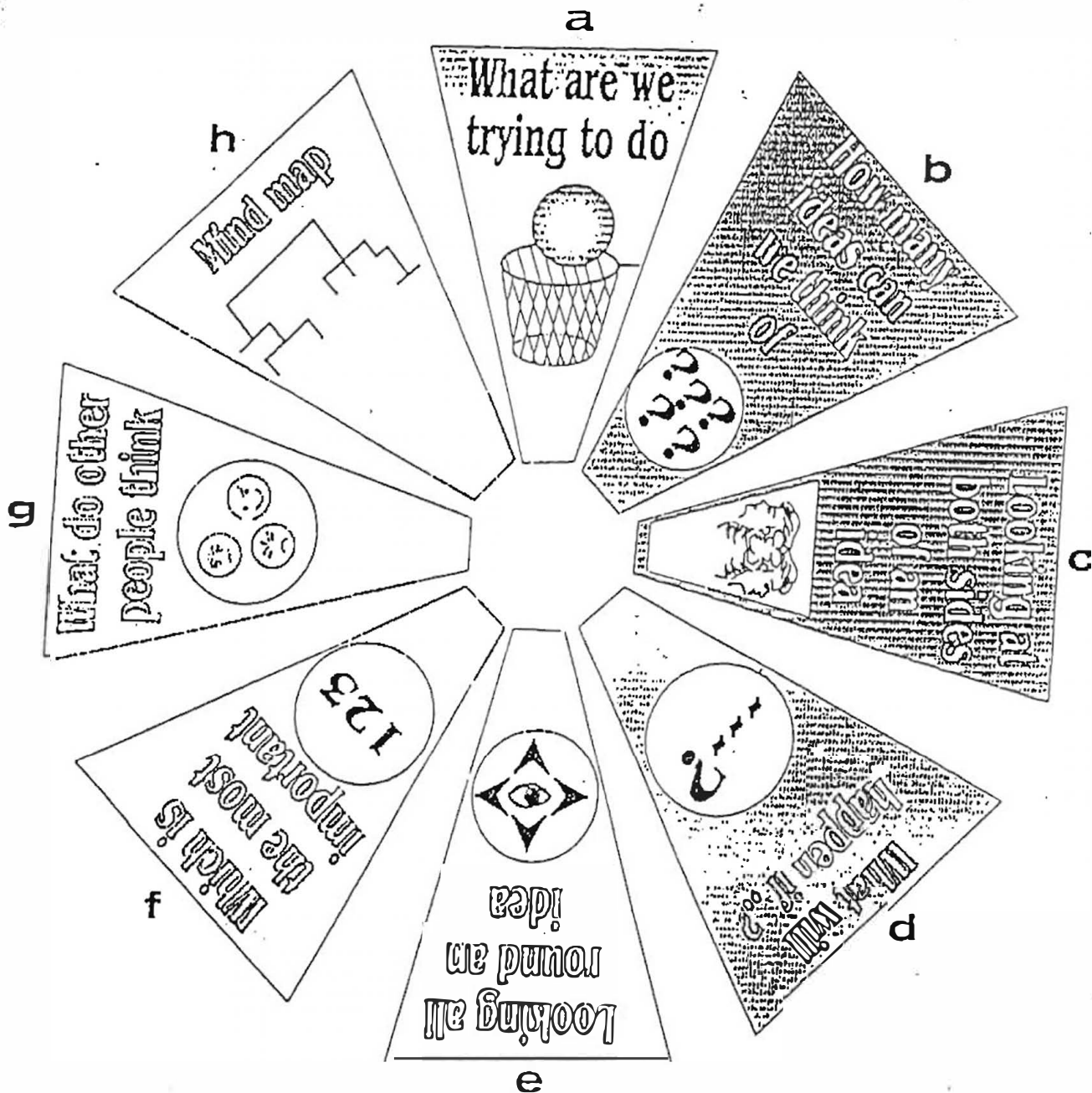


figure 4

THE TASC PROBLEM-SOLVING MODEL

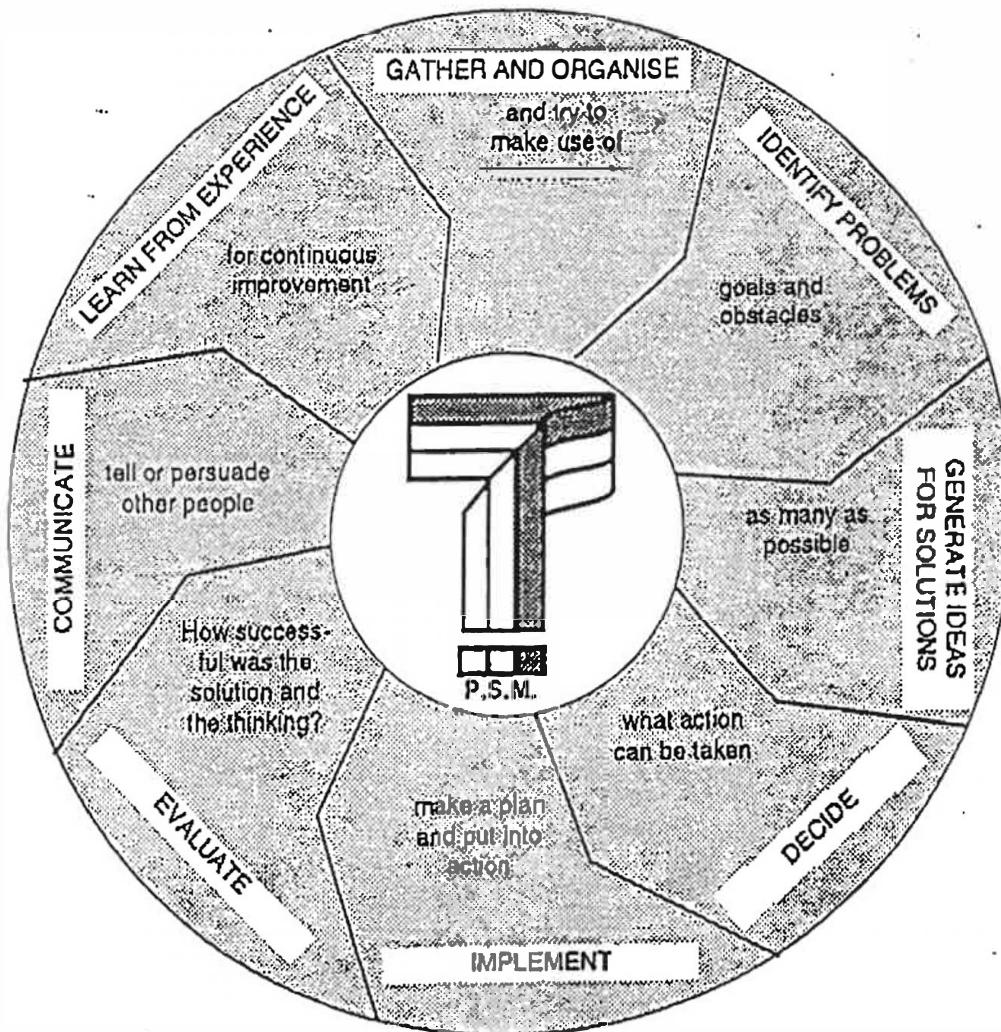


figure 5

Practising the skills and thinking tools

For these group exercises the participants were asked to work with teachers from schools other than their own.

4.2.2.4 Brainstorming : A tool for effective thinking

This is a technique for encouraging divergent thinking and is used to generate a large number of ideas. The striving for a quantity of new and unusual ideas was encouraged in the following exercise :

‘How many uses can you think of for a used coin ?’

Teachers were shown how to accept all ideas and to defer judgement. The roles of the note-taker (recorder) and spokesperson for each group were defined. A typical ‘report-back’ session was then held, with one person from each group presenting three new ideas. It was done in the form of a listening game : everyone had to listen carefully in order to avoid repetition.

4.2.2.5 Keywords: A basic thinking skill

The ability to think and record in keywords was identified as an important skill in school, both for note-taking and for planning. A strategy for this was demonstrated in a ‘telegram-style’ exercise. Groups had to send the most economical telegram - without losing the important information of the message. This led to much laughter, debate and discussion as to which kinds of words constitute ‘keywords’.

4.2.2.6 Making mind maps: A tool for effective thinking

The theme of the environment was used to brainstorm or 'explore all around an idea' (Wallace and Adams, 1993: Ch.6,p84). As the group gave ideas as to what constitutes our environment, the presenter demonstrated the recording of ideas by 'dumping' - jotting them down in random order. A class lesson was then modelled. The 'mind dump' was then organised into a more structured 'mind-map'- using colours, numbers, boxes, circles and arrows, etc for grouping like ideas together.

Mind-mapping was discussed as a means of organising information in a graphic way - in order to benefit the more 'visual learner.' Children in school are often exposed only to the linear, sequential, sentence-method of recording information. Mind-maps using colour, diagrams, drawings and keywords were demonstrated as an effective way to summarise and make sense of a mass of information in a graphically organised way.

4.2.2.7 Knowing directions - or Orientation

Knowing Directions - or Orientation was identified as an important aspect of thinking and was the last skill to be presented at this Workshop. Various pencil and paper exercises were done requiring the ability to describe spatial relationships between viewer and certain objects from different perspectives. The importance of children establishing an internal reference system for left/right/front and back with regards to their own position in space and in relation to others is very important. Different exercises to develop awareness of this in pupils were demonstrated. Teachers were asked to discuss how this skill could be

infused into their normal teaching time. Map-work, grid references, planning routes from home to school and treasure-hunts were suggested ways of doing this in Geography and Language classes.

4.2.2.8 Observation and comments on the skills session:

The more verbally competent members of each group tended to dominate. The teachers who had experienced this kind of working before were insensitive to the 'newness' of it to others. The black teachers, especially, working in their second language, were less willing to contribute, faced with the confidence and dominance of the other teachers. The researcher as facilitator was acutely aware of a tendency to withdraw on the part of the black teachers and consciously worked with groups, encouraging acceptance of every small contribution.

4.2.3 WORKSHOP 1

Session 3

This session was devoted to the application of the above Thinking Skills to the syllabus content and curriculum. Teachers of the same content subjects worked together e.g. groups of Geography teachers, Science teachers, Health teachers and Language teachers were formed. An environmental theme from the school syllabus was chosen and explored in mind-map style, and teachers then discussed ways in which the Thinking Skills could be brought into the lessons. Topics such as 'Forestry,' 'Plants' and 'Weather' were discussed. The teachers were shown the value of sharing the syllabus in this way with each other and

with their pupils.

4.2.3.1 Observation and comments on session 3

Again it was apparent how the competencies of the teachers differed within each group. The teachers from schools B, C and D found this much easier than those from A and E - where interviews with staff revealed that little collaborative planning is done. The teachers from the latter two schools, however, intimated that they 'learnt a lot' from their colleagues in this session.

Reflecting on the Process

The last half hour of this 5 1/2 hour Workshop was spent in reflecting on what had been covered, how the groups had worked together and what had been learned. The following comments from the Black teachers were recorded :

'I enjoyed it'

'It was very new to me'

'We need more of it'

'I liked the activities we were exposed to'

'I liked the fact that we could actually do the lessons'

'It gave us skills we can use'

'It created skills in ourselves. We need it more often.'

The White teachers' comments included :

'made us more sympathetic'

'it was enriching working with others and hearing what their needs are'

Indian and Coloured teachers all requested that similar Workshops be conducted with all their staff members at their respective schools.

4.2.4 Overall summary of observations, impressions and interpretations of the first centralised workshop

This Workshop with its participatory approach and small group discussions gave the researcher insight into the way the different cultural groups operated in interaction with each other. The white teachers tended to dominate, found it easier to adapt the Thinking Skills in flexible ways to their subject content - and assumed leadership roles in group discussions. This was disempowering for many of the black teachers who noticeably withdrew from contributing. There was a lack of sensitivity on the part of the white teachers to the reticence of others who were less familiar with the participatory, group-work approach of the Workshop. There was much more humility and understanding demonstrated by the Coloured and Indian teachers. The group dynamics seemed to the researcher an interesting reflection of society as a whole -and demonstrated the social-control of the heretofore dominant political group and how schooling has been used to this end in apartheid South Africa. There were undoubtedly tensions to be resolved - and this became an important aspect of the planning for the school visits. The researcher had to resolve the problem of establishing relationships of trust with the teachers from the other race groups who may have perceived her as threatening or lacking in understanding in the same way as it appeared they perceived the other white participants.

The data gathered from the focused group discussion gave insight into the problems teachers experience in their everyday lives. Areas in which they perceived help to be required needed to be addressed in the course of the project and an effort made to meet their expectations.

4.3 PHASE 1 - follow-up visits to schools, classroom observations and interviews with teachers

Introduction

The first visit to each school was intended to :

- establish contact with the principal and staff on a whole-school basis and to share with them the aims of the TASC project and to start building up a relationship with them
- to consolidate with the TASC delegates the work done at the Workshop and to facilitate a sharing of this with their fellow staff members
- to follow up by means of observation of lessons and semi-structured interviews on the success or failure of transfer of skills learnt at the Workshop to the classroom
- to give feedback on Thinking Skills lessons observed as a means of 'assisting performance' in the teachers' 'zones of proximal development' (see Chapter Two: 2.3.2; Adams 1994; Tharp and Gallimore, 1988).

(See Appendices 5 and 6 for Interview Questions asked in Phase One.)

Questions were asked in order to:

- see if teachers had been able to share with colleagues and if not to facilitate this

- find out if they had tried out any of the skills
- and if so, to find out how easy/difficult this was
- find out what they looked forward to at the next Workshop

4.3.1 First visit to School A

On the 17th February a Workshop was held at this school situated in a suburb just south of the city of Pietermaritzburg at the researcher's request. The aim was to report back to the principal and staff on what was covered at the Centralised Workshop. This was seen as a way of facilitating inter-collegial discourse between the TASC delegates and their fellow staff members so that the school staff as a whole would be aware of the introduction of Thinking Skills into the curriculum and of the TASC principles and methodology. Nine Senior Primary staff members attended, including the principal. (The school has a staff of 24 teachers and an enrolment of 1019 children. The area represents a black, suburban, low-socio-economic class). Out of the absent teachers, 'some were at a Maths Course, some were taking the choir and some doing sports'.

After introducing herself the researcher shared the aims of the project with the teachers, and initiated a discussion on why thinking should be taught. Some of the recommendations of the Nepi curriculum document were highlighted and the relevance of TASC as a means of addressing some of the problems in education was stressed. It was explained that TASC was a framework for introducing Thinking Skills into the curriculum.

'Brainstorming' was introduced as a technique or 'thinking tool' which could be used to

generate a large number of ideas about a topic. This was done with the teachers in three groups of three and the 'topics' for brainstorming were the problems in education which were identified by their delegates to the centralised Workshop. These were 'lack of resources in education' 'problems with classroom management' and 'the children's backgrounds'

This not only probed further and more specifically the general problems raised at Workshop 1, but also 'put the teachers through' the brainstorming process, using large pieces of newsprint and coloured pens to record the information. They were encouraged to use keywords only. A spokesperson from each group pinned the chart up and gave the report back to the 'class'. Thus a brainstorming session was again modelled for the teachers. The repetition for the TASC delegates of this method of working was felt to be advantageous, as it was apparent that skills from the first Workshop had not transferred. (The TASC delegates were asked during the discussion if they had had a chance to share their Workshop experiences with their colleagues. They had not been able to do this. Their comments were that they had not done this because of 'lack of confidence' / 'not quite clear about TASC so couldn't tell others' and having 'little time'. When asked if they had practised or taught any of the Thinking Skills learnt with their classes, they replied that they had not). Observation in the classroom revealed that teachers at this school all attempted to use some kind of visual aids in their teaching even though they themselves have to buy any extras such as cardboard for charts, glue, prestick etc.

4.3.1.1 Analysis

Impressions / Interpretations from field notes on this visit

The staff were not very responsive at first. The teachers appeared subdued, almost as though they were suppressing feelings of resentment or impatience. Being closer to the city, these teachers would be more politically active and very aware of the glaring disparities between educational provision in white schools compared with their own. One had the impression that they were tired of talking about the problems they experience in their schools. However the 'brainstorming' session in small groups with the researcher moving between groups, acknowledging contributions and clarifying meanings resulted in a more relaxed atmosphere. The group report backs (two given by non-TASC delegates) showed a greater willingness to participate and gave rich descriptions and a much deeper insight into the difficulties and grievances of the teachers in coping with limited resources, large class numbers, and the violence that has affected the children. (Unfortunately these revelations are outside the scope of this dissertation.)

From this first school visit it appeared that there was little carry-over from the centralised Workshop either of information to the staff or into the teaching.

Many teachers were attending in-service courses run by their Department, or were voluntarily attending courses at the local Teacher Training College in the afternoons. Although there was evidence that they were trying out 'new skills' with their children ('we're learning this at Indumiso'), the teachers in the classes observed still tended to dominate and do all the talking. Being an observer was necessary for the researcher at this

point, and her field notes served to confirm the picture of the 'disabling curriculum' described in the literature survey of Chapter Two. Observed in terms of the TASC Teaching Principles, most learning taking place was by repetition as a class and language was drilled and repeated. Not much attention was given to individual children and there were few opportunities for the pupils to express themselves or interact with one another. There was little evidence of written work being done - all lessons observed were wholly oral. Questions were intended to illicit 'one right answer' and incorrect answers were not discussed. The children, however, were bright and responsive and one of the teachers commented that 'most of them have television sets in their homes'. Text books had to be shared between groups of two or three children. Teachers were appreciative of any positive comments made. As no Thinking Skills lessons were being taught at this stage observation of prepared lessons will be commented on in detail in Phase Two.

4.3.2 First visit to School B

The first visit to this school in an Indian suburb close to the city centre took place on 15th February. This school has a staff of 24 with an enrolment of approximately 500 children. All staff except for the principal were present.

The meeting was held in one of the classrooms which was brightly decorated with wall charts and children's work. An overhead projector had been set up for the meeting. Again the reason for the meeting was to explain the TASC framework to the staff and to inform them of the aims of the project and to share with them what their colleagues had done at the first centralised Workshop. The researcher's role as presenter at the workshops was

explained as one that would facilitate the implementation of Thinking Skills in the curriculum. She was to translate the theory of the model into practice and to help teachers to implement the skills and strategies in their classes. It was explained that the TASC framework evolved out of modern theories of intelligence, teaching and learning, and was a way of arousing pupils from passivity, of improving motivation and of equipping them with problem-solving and leadership skills for the future. Some of the **Basic Thinking Skills and Tools for Effective Thinking** were outlined and the **Problem-Solving Wheel** briefly explained.

Again a **brainstorming** session was modelled - the topics being those highlighted by the delegates from this school at the first Workshop. Four groups were formed and each group was given a problem in education to discuss. Most problems for teachers from this school were those relating to restraints on teaching in the curriculum. Irrelevant syllabuses, content over-load, time-tabling and the need for extension and remedial teaching in one class, as well as having to satisfy test and exam requirements were all seen as restricting.

Some Thinking Skills activities were done in groups in the same way as at the main Workshop with the whole staff participating. The skills of **comparing** and **seeing other points of view** were discussed. The active involvement of all the teachers generated great enthusiasm. Many of them asked when the next meeting would be.

4.3.2.1 Analysis

Comments, impressions and interpretations of first school visit and interviews at School B

The enthusiasm for the project was obvious here. The idea of bringing Thinking Skills into the curriculum was taken seriously by the staff as a whole. They wanted to take down the names and addresses of other schools involved, and enquired about feedback from the other project schools. The recorded notes from the 'brainstorm' on educational problems were interesting, in that two groups presented 'mindmaps' of their discussions in **keywords** - as demonstrated at the centralised Workshop. The **spokesperson** from each group (two of whom were TASC delegates) were eloquent and confident and commented on how much they had used the techniques of **keywords**, **mindmapping** and **brainstorming** since learning them at the main Workshop. The visual, as contrasted with a linear method of recording work, was discussed. These skills had been shared with the Junior Primary teachers and the librarian who had already started teaching the children 'new ways' of researching their projects. One of the J.P. teachers was so enthusiastic that she asked to join the project. Not only had these teachers shared with their colleagues the TASC aims and principles at subject committee level, but they expressed the hope that senior members of staff would 'come on board' when the researcher addressed the staff at the school meeting. These teachers reported increased participation on the part of the children, including shy ones. Teachers had used the Thinking Skills in subjects other than those mentioned at the Workshops, indicating the ease with which they were bridging the

Thinking Skills into the curriculum:

We even used it (brainstorming) in a subject called Cultural Studies - which is very teacher-orientated - where you (the teacher) present the facts. We brainstormed The Election (Std 5 level). **All** the children were involved. There's a difference now. The content comes from the children. It's not coming from the teacher any more. The children give you the starting point' (Quoted from transcribed interview with Teacher One: 15 February, 1994).

The teachers reported that the children enjoyed taking the roles of note-taker/recorder and spokesperson and did it 'just as we did it at the Workshop.'

The significance in terms of this research study is that the introduction of the first few **Basic Thinking Skills** and **Tools for Effective Thinking** were easily transferred by these teachers. The modelling of Thinking Skills lessons at the Workshops, in terms of transfer, seemed to have been successful. The staff here were thinking of converting a reading period for each class to a 'creative thinking' period; the Maths department had already introduced a problem-solving approach which was being trialled. These efforts indicated that the teachers at this particular school were both innovative and creative. A curriculum initiative such as that of TASC seemed to provide, in this case, just the kind of theoretical framework required to give cohesion to the staff's efforts. It appeared that attempts to effect changes in both teaching and learning and to promote autonomous thinking on the part of teachers (see TASC aims: Wallace and Adams, 1993) could be positive where a staff were motivated and planned together. The teachers at School B were demonstrating the ability to be 'change-agents' by implementing the skills directly and without waiting for any kind of departmental directive or go-ahead. The teachers in this school, judging by the work on classroom walls and the enthusiasm at the meeting, were

well motivated and competent. 'Attitudes and teacher relationships' (Campbell, 1985: p.44) would thus be important factors in promoting school-based curriculum development in a primary school. When asked what they looked forward to at the next Workshop the replies were: 'more of this' / 'more Thinking Skills' / 'equipping us as teachers with Thinking Skills.' They also saw the introduction of Thinking Skills as a means of shifting from the traditional curriculum as described by Bennett and Carl Rogers (cited in Davidoff and van den Berg, 1990, p24 and 25) to a more progressive one. This would see teachers as facilitators of learning rather than merely dispensers of knowledge:

You are basically a guide, advising the pupils - a leader. (Quote from interview with Teacher One).

4.3.3 First visit to School C

This school was visited on the 9th February two weeks after the first Workshop. The researcher was met by the principal and shared a cup of tea while discussing the TASC project. The content of the Workshop was discussed as well as the kinds of activities to which his two TASC representatives had been exposed. This was a good opportunity to gauge the principal's support for the project. While happy with the researcher's presence in the school, this man seemed preoccupied with the pressures of administration and did not appear to want to involve himself in the TASC project in any way.

This school caters for over 700 pupils and has 24 staff members including the principal. The medium of instruction in this school is English from 'day one' - i.e. from the first year of school - but for many children English is a second or even third language.

The principal indicated his frustration at constantly being pressurized to take more children. Traditionally a school for so-called 'coloured' pupils, this school is situated very near the city centre. The demand for more places for black children had increased dramatically with the recent changes in admissions policies across departments. This had put pressure on the principal to admit more pupils than the facilities could cope with.

The talk to the staff had been planned along the lines mentioned above for all first visits. It was lunch time and the playground was a-buzz with noise and laughter.

A formal presentation of TASC did not seem suitable at this meeting - because of the short lunch break, the noise on the play ground and the fact that the teachers were eating their sandwiches, etc. The room was too bright for the overhead slides to show up - so the format was changed. The ability to be flexible in one's research procedure was one of the advantages of a qualitative research design (3.3.6.1 above). It was thus possible to adapt the meeting to suit the mood and conditions encountered here. In keeping with the casual, friendly atmosphere, informal questions were put to the staff. They were asked if they were aware of the Workshop attended by two of their colleagues, and of the fact that this school had been identified as a pilot school for the TASC project. They were unaware of both these facts. This suggested that conditions were not conducive to sharing of information between staff members, and confirms the research suggesting that SBCD is facilitated when teams of teachers work **with a co-ordinator** from a central project (Sabar, 1985) rather than on their own. The researcher called on the TASC delegates to share their perceptions of the project so far with their colleagues. They described the **Basic Thinking Skills** presented at the Workshops and how they had tried them in their classes. The staff were

asked to think of any other types of thinking 'used' in everyday life - and they came up with the following : 'making decisions', 'planning' and 'organising'. The necessity to **compare** in order to choose or make decisions was then discussed, and the comparison activities of the Workshop introduced. The researcher then grouped the staff and introduced 'brainstorming' as a technique for generating a large number of ideas. The 'Problems in Education' headings were distributed as before. The 'rules' for brainstorming were listed:

- to generate a large number of ideas
- to suspend judgement
- to accept all ideas
- to have a time limit

A spokesperson from each group gave the report back on :

- Lack of material resources and teaching aids
- Problems in the classrooms
- Problems of language

As with the other schools, this fleshing out and in-depth exploration with all the teachers of the problems faced in the classroom gave the researcher further insight into how education has been affected by apartheid policies - and the effect these have had on the teachers themselves. The views expressed, however, were not as important for the purposes of this study as the process of exposing the staff to the Thinking Skills and strategies in an experiential way. Nevertheless the opportunity for teachers to verbalise problems in their everyday lives helped the researcher to better understand the **context** of the school and the factors that most seem to affect teaching and learning. It also served to 'bring the teachers

in' on the project in a participatory and interactive way.

4.3.3.1 Analysis

Impressions and interpretations of first visit to school C - Phase one

General

The atmosphere at School C was lively and busy and the researcher was greeted cheerfully by most pupils she passed. Humour on the part of the staff seemed to be used to deal with most problems. In answer to the researcher's comment that the children 'sound happy' the reply was, 'Yes they're happy - ignorance is bliss !' - followed by laughter. During the discussion on language, problems of pronunciation, spelling and grammar were mentioned.

When asked if English was a second language to the majority of pupils a teacher quipped:

It's more like a 3rd, 4th or 5th language to most !' (laugh).

One had the feeling that some teachers were concerned and motivated but that there were many who were resigned to the increasing pressures and would continue simply to 'make the most of a bad job'. Reference was made to some incumbents as 'burnt out teachers over 60 who would never change' whereas it was felt that there were 'young, enthusiastic ones out there who are unemployed.'

The TASC delegates

The two teachers who had attended the TASC Workshop had not 'had the opportunity' to share anything with their colleagues - but 'had spoken to the principal.' They had both tried the Thinking Skills in group situations in their classes and commented that some of

the exercises 'helped with vocabulary'. The method of accepting all pupils' ideas in a brainstorming lesson and withholding judgment till discussion time - 'helped the weak children' - 'They liked that'. Though lacking in confidence, it seemed that there was a genuine desire on the part of these teachers to improve their practice :

We need more input and practice ourselves first. Maybe we can have a Saturday Workshop (instead of a lunch time) when we can spend longer. Also get other schools from the House of Reps (Coloured Schools) - I'm sure I could get twenty to thirty people.' (Interview with Teacher 2).

The desire to 'network' and have contact with other professionals was one of the needs expressed at the first Workshop by these teachers and it was re-iterated here. They had attempted to introduce the Thinking Skills in their content subjects, 'even in Science' - and found that eliciting ideas from the children helped them recognise those with cognitive deficiencies:

'When we brainstormed weights and measures one child even wrote down "desk" - but we accepted it - we didn't judge it wrong.' There was a certain empathy with the children revealed here. The fact that 'brainstorming' is more appropriately used in creative thinking situations did not really matter. These teachers had used it to allow children to express what they knew about a subject without fear of ridicule or failure.

This indicated a positive shift in terms of the teachers' methodology - from the 'teacher tells' syndrome to more participation on the part of the pupils. In terms of TASC's aims for the pupils it would seem that the teachers were paying attention to the enhancement of self-esteem in the learners.

4.3.4 First visit to School D

First school visit - observation, interviews and the modelling of Thinking Skills lessons.

Situated in a white, high socio-economic area close to the city centre, this school has an enrolment of 842 children. There is a principal and two deputies as well as 4 staff members who are non-class teachers. There are 28 class teachers. The staff of this school had previously invited the researcher (before the start of the TASC Project) to address them on implementing a Thinking Skills/Enrichment programme at senior primary level.

Some of the Std 5 teachers and the teacher in charge of the media centre had already begun incorporating Thinking Skills into their time-tables. The first school visit therefore was different in nature from the visits to the other schools. An interview with the principal was held on 8 February to discuss the TASC project in the light of what was already being done in the area of Thinking Skills at the school. A semi-structured interview with one of the project teachers was also held to follow up on the group discussions of the January Workshop.

These interviews revealed :

- They were aware of the skills-based approach and were already incorporating some Thinking Skills in their teaching. They did not have any particular model to follow and there was little coherence in the attempt.
- An outside educational consultant was running study skills courses with all the senior primary classes in mindmapping and research skills applied to project work. She was also helping with 'bridging' classes for second-language children.

- This school had one accelerated class of approximately 33 children and three mixed ability classes at both Std 4 and Std 5 levels. This meant that 'the already good thinkers could forge ahead'.
- The 'problems of language and communication' mentioned at the main Workshop only affected 'one or two children per class' who were learning in their second language.
- The TASC delegates from this school were aware, for the first time, as a result of the centralised TASC Workshop, of the privileges of white education and its provision compared with the vast and critical problems facing schools, teachers and pupils in the other education Departments.
- There were no 'problems' in terms of classroom management, lack of resources, or poor background of children as mentioned by the other schools. The only problem was that of increasing costs to parents for extras such as excursions, etc.

Demonstration lessons

In the period between the first two centralised Workshops the researcher was invited to teach some Thinking Skills lessons at this school. This was seen as an opportunity to give input on the metacognitive aspects of teaching for thinking and to demonstrate teaching for transfer - two aspects often neglected in Thinking Skills programmes and which contribute to durability (Mathfield, 1992). Lessons were given on 16th and 23rd February with two other teachers from the staff observing. This could be termed 'peer coaching' as described by Washington (1987), or 'modelling' in terms of social learning theory (Bandura, 1977; Bell-Gredler, 1986). Aspects of the TASC methodology which appeared absent in the lessons observed were emphasised. Divergent thinking lessons were demonstrated to a Std

4 class emphasising thinking processes, acknowledging group co-operation and acceptance of others. Time was made for reflection on the thinking process (metacognition). Discussion of other areas where this kind of thinking would be relevant was encouraged and examples elicited from the children. The teachers were shown how to devise lessons that would give more (and varied) practice in the same skills, but in different contexts (teaching for transfer).

4.3.4.1 Analysis

Impressions and interpretation: phase one - school D

The TASC teachers at this school were extremely competent and organised with journals and weekly schedules (shown to the researcher) outlining 'skills and processes' applied across the curriculum in a thematic approach. There were no constraints in the curriculum as to what or how they should teach. They were very flexible as far as the time-table is concerned. They were autonomous in their actions and had the full confidence of their principal and department heads.

The attitude of the teacher interviewed to the admission of pupils of other cultural/language groups was in the opinion of the researcher 'assimilationist' (Christie, 1990). There was a lack of generosity and understanding with regards the new pupils - who 'caused problems' because of cultural differences:

Some children just won't talk and this can be construed as rudeness.

the greeting etiquette is not understood.
they have a different sense of time, coming to school late,
etc.

When asked if cultural differences could not be 'mediated' within the TASC framework and methodology, the researcher sensed in the interviewee a sense of 'impatience' in having to spend extra time (in Maths for example) with a specific child:

the rest of the class became very frustrated.

As far as the implementation of the **Basic Thinking Skills and Tools for Effective Thinking** covered at the first Workshop were concerned, these appeared to have been successfully transferred with the modelling of the skills a significant factor.

In a Reading Study last week we did keywords. They really struggled to summarize, so I did the "telegram strategy" you did with us - and it was lovely, it worked really well.

It appeared that the strategy was important. This teacher had also applied brainstorming and mindmapping to the topic 'Air Pollution' in Science. She suggested that synthesising from keywords in order to 'reconstruct' a paragraph could also be taught along with sequencing and listening skills. This teacher was beginning to identify important basic thinking skills herself. She demonstrated the ease with which the skills could be infused into the content : 'the only difference now is that you've made us aware of what we're doing and why'.

It was thus apparent that School D teachers would not have difficulty applying the Thinking Skills in the curriculum. Help would be needed in the application of the ten TASC teaching principles : the metacognitive aspects and teaching for transfer. Indeed, for the researcher these aspects were more important than the actual skills. The situation could arise here where the **Basic Thinking Skills and Tools** might be incorporated as 'content' and 'ticked

off' on a checklist of skills to be taught without the 'process' being adequately mediated. In observing in the classroom 'group work' was done in the sense that each group was given a different problem to solve - but children were still working individually. The idea of co-operative or collaborative learning was not put into practice. The teacher in fact had commented that 'group work can't be done too often. The children fool around'. The competitiveness of the children and 'the first to finish' being acknowledged were prominent characteristics of the classes observed. Thus many aspects contrary to what has been termed **enabling** (Chapter Two) were prevalent.

The approach taken for the school visits to School D was different because of the stage in the teaching of Thinking Skills that this school had reached. However, it is felt that a full staff Workshop near the beginning of the year would have been valuable in giving greater clarity and cohesion to the TASC curriculum initiative. Yet this was delayed until Phase Four which, in retrospect, was a mistake in terms of a school based approach. It is felt that the contact and interaction with the teacher interviewed, the principal and two teachers who observed the modelled lessons was not sufficient to influence or inform the whole staff. Although they would be aware of the intervention of the TASC co-ordinator it is possible that the researcher as facilitator at a full staff meeting earlier in the project would have given more impetus and cohesion to the teaching of Thinking Skills at this school.

4.3.5 First visit to School E : Staff workshop and classroom observation

This school is situated about 35 kms out of the city in rural Kwa-Zulu/Natal and

administered by the Kwa-Zulu Education Department. Many of the parents are subsistence farmers, labourers on neighbouring agricultural estates or unemployed. Over-looking the Valley of a Thousand Hills, there is no industrial infrastructure and few job opportunities. The school does not have electricity and the only water available is from a hand-pump in the middle of the school courtyard. (See photograph on page 134).

The school was visited on the 8th February. On requesting an opportunity to address the staff on the TASC Project, the researcher was invited by the principal to spend a morning at the school. An hour and a half was set aside at the end of the morning session for the staff meeting. The researcher had the opportunity for in-depth discussion with the principal regarding the school, the community, staffing and pupil numbers. This school has 18 staff members including the principal. The enrolment now stands at 534 children whereas three years ago it was 1500. Numbers have been dramatically affected by the violence in the area. Many families have left the area or are keeping their children out of school.

School E : staff workshop

As with schools A, B and C the aim of this staff Workshop was to bring the 'non-attending' teachers into the TASC project by briefly informing them about the Thinking Skills Workshops. As a pilot school they all had the opportunity to be involved, to benefit from the interaction with TASC colleagues and to learn the what and why of teaching for thinking. They had the opportunity of developing skills based on the TASC methodology which aims to improve teaching and learning and which is underpinned by sound educational theory. A graphic handout of the TASC model -the **Problem-Solving Wheel**, the **Tools for Effective Thinking** and the **Basic Thinking Skills** - and its aims for the

teacher, for the pupil and for the curriculum was given to each teacher. (There was no electricity in the school and therefore no overhead projector). Teachers took turns in reading a few key points from the hand-out. Reasons for specifically teaching Thinking were discussed - the main ones being to promote independence and problem-solving skills in the learner, to encourage active participation and inquiry and to make learning relevant to the everyday lives of the pupils. Some Basic Thinking Skills were explained, like the need to 'compare' when making choices or decisions. The Problem-Solving Wheel was looked at and the skills elaborated for some of the stages - e.g. 'gathering information' about a problem. The group 'brainstormed' all the different 'sources of information'. 'Generating ideas' was discussed as another way of describing 'brainstorming'. A Zulu word meaning 'to activate the brain' was suggested for this. The enthusiasm for the technique of contributing a great quantity of ideas about a topic - without judgment and in a co-operative learning climate was evident. This was put into practice when groups formed to 'brainstorm' some problems in education. The topics were those arising from the centralised Workshop. Again the lack of even basic material resources was stressed (and clearly evident in that there were no pictures or charts up on any of the senior-primary classroom walls). These children had very few exercise books 'because the parents will never buy them - one of the reasons is starvation' (quote from one of the teachers). Text books given out were often those 'not used by anyone else any more' and the principal commented that they'd 'be lucky to get their text books by August.' The problem of English as medium of instruction (from STD 3) in this totally Zulu-speaking environment was also reiterated here :

The main difficulty is that the children are not working in their own language.

These children never hear English spoken except by their teachers. They are also taught Afrikaans. The lack of relevance in the curriculum is a major issue.

Teachers described their own education as 'inferior':

an education system that was implanted for blacks.

The vote of thanks at the end of the visit was given by one of the TASC delegates. Her feedback on the first Workshop was extremely positive. She felt so enthusiastic and motivated that she 'wished her class was right there so she could go in and teach them immediately'. There was a tremendous warmth and enthusiasm on the part of the staff who were clearly keen to update their own skills and knowledge.

Comments made by the researcher in her field notes at the time expressed concern that the teachers felt that provision of material resources was the answer to their teaching problems. The teachers viewed the children as having nothing to offer - or to bring to the classroom. The pupils, coming from a poor environment, were dismissed as ignorant, with nothing to contribute. The teachers, therefore, felt that the burden of trying to teach them anything was extremely onerous. This was especially so without 'pictures, magazines and books'.

On the 2nd March the researcher spent four hours as participant observer in two junior primary and three senior primary classes. The aim for the purposes of the research was to gain insight into, and an understanding of, the way the teachers were teaching. It was also important to understand the social context in order to plan further work with these teachers.

In the junior primary classes the teachers had made number charts with old calendars, and

had stuck pictures onto brown butchers' paper for visual aids. Teaching in the children's mother tongue, the interaction, questioning and personal involvement with the children was much better than in the higher classes. Here the most noticeable characteristic of teaching and learning was the emphasis on oral repetition of words. The children were constantly drilled in vocabulary and language structures at the expense of understanding and coherence of subject matter. The teacher was always in control - expending huge amounts of energy which appeared completely misdirected. There was very little teacher-pupil interaction in the higher classes. Most questions were directed at the whole class. Questions were such that they only demanded a 'yes' or 'no' for answers. Most answers were given in unison. Mistakes or wrong answers were simply ignored or dismissed - and were never used as a springboard for further explanation or discussion. In terms of the TASC teaching principles and the criteria for more 'progressive' methods (Davidoff and van den Berg, 1990) teaching and learning at this school were 'traditional' in the most negative sense.

4.3.5.1 Analysis

Impressions and interpretation of observations - school E

What was revealed about this educational setting was the sense of isolation : teaching and learning appeared to be happening in a vacuum. There was no community or parental involvement; the teachers had little contact with other schools and few opportunities for professional development. The fact that the observer's presence was of such significance that the visits became 'occasions' (borne out by a teacher's comments that the children were so excited when they saw the car') seemed to suggest that any departure from the routine was a welcome break and that very few outsiders ever visited here.

Teaching appeared to be something that 'was done' to children in a mechanical way. A particular style of teaching was evident : the children were not seen as individuals and were seldom referred to by name. When the staff were attending the meeting, the children sat silently in their classes but with no books out to read or to write in. The principal's role seemed to be that of a 'warden.' Order and obedience prevailed and the quietness was only broken when a class had singing or recitation of poems learnt by heart and said in unison. It was then that the children were most vibrant. The resonance and energy of the voices suggested that these activities were a welcome release from having to cope all day with listening to content subjects taught in what was virtually a foreign language. Good relationships with the principal and staff were established.

4.3.6 Overall summary and conclusions of PHASE ONE

The descriptions of the researcher's contact with each school in the first two months of the project are an important part of this analysis in the sense that they contextualise the situations from which the project teachers came. An understanding of the differences in the physical environment and background of the teachers was gained, as well as insight into the disparities in educational resources, materials, equipment and facilities which exist across the five education Departments. These inevitably affect the motivation, perceptions and attitudes of teachers and are of great importance when trying to understand factors which either promote or militate against school based curriculum development which is the focus of the study.

In terms of the research design Phase One was exploratory. It was equivalent to the

'reconnaissance' or 'fact-finding' part of the Action Research Cycle (Davidoff and van den Berg, 1990: p37). It gave a sense of how the project would proceed once all the schools had been visited and all initial contacts had been made. The researcher at this stage had started implementing the 'general plan' (Kemmis and Elliot models illustrated in Walker, 1985: p184-185). This was to train teachers in Thinking Skills as a means of improving teaching and learning while familiarising herself with the contexts in which these skills were to be transferred. How to structure the next centralised Workshop for Phase Two was largely dictated by these findings.

The researcher had to ask at this stage:

- whether the theoretical understanding gained at the first Workshop and the practical training undergone were sufficient for the Thinking Skills to be successfully implemented
- whether teachers were able to share these skills with colleagues in order to broaden the base of the curriculum innovation
- whether there were significant constraints or difficulties impeding implementation, and if so what these were and how they could be overcome

4.3.6.1 Analysis in terms of practical implementation and SBCD

Implementation of Thinking Skills

School B had gone right ahead with implementation of Thinking Skills and had sought ways of bridging the skills into the curriculum. They saw TASC as adding to curriculum change already under way. School C teachers, though lacking in confidence, had made a

tentative start and were supporting each other. They were very keen for more input. School A was still to be convinced of the value of the TASC approach and had made no attempt to implement any of the skills. School E was enthusiastic about the contact with other teachers and saw the TASC project as a means of 'updating' their skills and developing professional knowledge. They had not tried out the skills in practice. School D appeared to be complacent about the project and saw it as an optional extra. These teachers were confident about their teaching ability and happy with the curriculum as it is. The Thinking Skills were assimilated as part of what was already being done.

A new curriculum initiative was easily implemented where the staff involved were highly motivated and had leadership qualities, with a certain amount of autonomy within school structures. Where the need for change in methodology was not perceived as a priority - and where there were other profound difficulties in schools - such an initiation would not be taken up with any determination on a school-based level.

Sharing of new skills with colleagues

School B teachers discussed TASC at subject committee level. They also gave a talk to their junior primary teachers and included the librarian. None of the teachers from the other schools had shared TASC with their colleagues by the end of Phase One. School C teachers would have liked to, but were not actively encouraged by the principal.

Constraints and difficulties

The main difficulties with implementing the skills at this stage were as follows :

School B found that 'the syllabus' and the 'time factor' were constraints. 'We must satisfy the requirements for exams and tests'. The subject specialist teachers (health and science) could not easily fit in Thinking Skills when taking classes only two periods a week each.

School D also thought that the preparation of Thinking Skills lessons would be time-consuming.

School C felt they needed 'more input and practice first.' They felt that the principal did not actively support them.

Schools A and E seemed to be without the power of action: they lacked understanding and confidence and appeared dependent on more direction from outside sources.

Pupil responses

In terms of teaching and learning, where lessons had been tried, the factor to emerge most strongly was the response of the pupils. The participatory mode of organisation embodied in TASC methodology seemed to encourage children to contribute more to lessons. Significantly, lessons were not tried in the schools where the transmission mode of teaching was most strongly entrenched.

Preparation for Phase Two

The 'general plan' could now, in terms of the action-research design, be revised. There was a need for the Workshops to be conducted on more participatory lines. Less confident teachers needed more opportunity to contribute and to communicate within small groups.

They needed to be acknowledged for every small effort, to learn from their more competent peers and to receive more input. They needed to experience and practise Thinking Skills in relevant and meaningful contexts (TASC teaching principles, Wallace and Adams, 1993; means of assisting performance: Tharp and Gallimore, 1988).

End of Phase One

(See overleaf for forward planner for Phase Two)

FORWARD PLANNER: PHASE 2

SCHOOL	16 MARCH SECOND WORKSHOP	State President's Inauguration Election Period Early April: Easter Vacation	FOLLOW-UP SCHOOLS VISITS	Implementation of Thinking Skills Analysis of Observations	HOW IS IT GOING?
A	12:30 Tea and sandwiches 12:30 – 15:30 Group discussion/ Reflect on implementation of skills Questionnaire		<p><i>26 May</i> Unstructured interview with principal 08:45 Observation: Std 4D Maths; Std 3 English – Comparison Interviews 1 and 2</p> <p><i>27 May</i> Std 5 English – Litter; Comparison; Std 4 Religious Studies (in mother tongue) Interviews 3 and 4</p>	Summary of observations and actions School A	Overall summary of impressions: Observations/Interviews and <i>Implementation</i> of thinking skills
B	Report-back on school visits Revision of first workshop: Skills learnt and examples of how they were applied; Shared examples of children's work.		<p><i>2 June</i> Observation: Comparison Std 5 Geography Points of View Std 5 Science Comparison Std 5 Health/English Classification Second staff workshop Interview Teachers 2 and 3</p>	Summary of observations and actions School B	Third Action Research Step * Gathering information from group discussion and observation * Actively understanding what is happening * Monitoring progress
C	Introduction of new thinking skills: 1. Why teach comparison? Some group activities involving comparison and bridging into the curriculum.		<p><i>6 June</i> Visit cancelled Teachers involved with other courses</p>	-	Fourth Action Research Step * Reflecting and critically evaluating * Adapting and planning for third workshop in order to improve
D	2. "Points of View" Role-play and bridging into school subjects		No follow-up here Teachers went ahead with implementing skills Telephone contact with Teacher 2	-	
E	(3 hours)	<p><i>20 April</i> Visit cancelled (Election/tension) <i>25 May</i> Visit cancelled (Pay-day for teachers) <i>3 June</i> Visit cancelled (Stock-taking; end-of-term examination)</p>	-	Completion of First Action Research Cycle	

4.4 PHASE TWO

Second Centralised Workshop held at Natal College of Education on 16 March 1994.

Introduction

This three-hour Workshop consisted of group discussions in which the teachers shared their attempts at implementing the Thinking Skills and reported on the children's reactions and any difficulties experienced. They filled in a questionnaire on the meaning of 'curriculum' and whether they, as teachers, thought they could influence it in any way. The researcher reported back on the school visits and reminded delegates of the skills practised in the first workshop. Two new skills were introduced which were then contextualised and put into practice in real-life situations. Ways of bridging these skills into the curriculum were demonstrated.

4.4.1 WORKSHOP 2

Session one

Group discussion / reflection

The first session of this workshop provided an opportunity for the teachers to reflect on their practice. This is an important aspect of action research (Carr and Kemmis, 1986; Davidoff and van den Berg, 1990). It took the form of small group discussions where teachers shared with one another the lessons attempted since they had last met. They were to describe (1) what skills were taught in what subjects, (2) the children's reactions, and (3) any problems encountered with implementation.

The following are examples of Thinking Skills lessons attempted and reported on by the teachers:

In English

- Use of key words and brainstorming to generate ideas for paragraph writing.
- Antonyms/Synonyms - recorded in mindmap style and elicited from the children.
- English oral - report-backs from group brainstorming, after idea generation: 'Your house is on fire. What can you do'?
- Paragraph planning - 'Dumping' of ideas and then organising them. Topic: 'Saturday morning'

In Geography

- Why do people live in certain areas?
- Orientation/Knowing Directions - Children described positions of objects in relation to themselves.
- Treasure hunt - following and giving directions.

In Guidance

- 'Manners' - brainstormed ideas:
 - on the sports-field
 - at home
 - at school.

In Health

- brainstormed and wrote key words on 'The Body' - Flash cards up for spelling and vocabulary.

In Science

- key words relating to the parts of a plant (in diagram form / labelling)

At this stage all attempts were acknowledged and teachers congratulated on their efforts. Those who had not tried were encouraged by seeing that it did not mean any drastic change in content, but rather adaptation of regular content to accommodate the new approach.

Comments on children's reactions to these lessons were as follows:

- 'The ideas came from the children'.
- 'They brought about the concept. It was deductive'.
- '... increase in vocabulary ...'
- 'Meaningful learning took place'.
- 'Children found out, instead of the teacher just telling them'.
- 'Homework was better because the children enjoyed the lesson'.
- '... more participation ...'
- 'It encouraged children to express themselves'.
- 'Children gave many ideas that I didn't expect them to have'.
- 'More risk-taking - they were interested in giving their ideas'.
- 'They enjoyed these thinking skills words. They see the words up and it helps'.
- 'They ask for more topics to brainstorm'.
- 'The atmosphere was pleasant because they were free to talk'.

Comments from the teachers on 'Problems associated with the Thinking Skills' were as follows:

- 'There are many passive learners and poor spellers; their pronunciation is poor. They are poor at expressing themselves in English'.
- 'Some children have misconceptions and can't focus on the topic'.
- '... big classes - very difficult to reach each child'.
- 'We're working against the time-table'.
- 'Some would hide and not speak'.
- 'it's time-consuming'.
- 'What would the parents see in the books'?
- 'We have set objectives, so there is a restraint here' (covering the syllabus).

This exercise was valuable as it demonstrated a number of shifts in perceptions on the part of the participants, as **teachers** and as **learners**.

Sharing ideas in small groups was a way of encouraging active learning. In a Vygotskian sense the teachers who had not attempted to implement the Thinking Skills could learn from their more capable peers. They acquired ideas for bridging the skills into the different subjects by listening to one another's reports.

The reflection on the children's responses (quoted above) indicated increased motivation and enjoyment and more pupil-centred learning and active participation. The teachers seemed to have allowed more to come from the children, although the problems of passivity and shyness were also mentioned under 'difficulties'.

On the whole, the main 'problems' with the Thinking Skills as far as the teachers were concerned were the children's difficulties in understanding English and of expressing themselves in English where this is a second language. Time constraints were a problem. The Thinking Skills impinged upon teaching time for subject teachers, and on preparation time where there were no photo-copying facilities. A concern was expressed as to what would be reflected in the children's books.

The researcher noted increased confidence on the part of participants when giving their report-backs.

This 'gathering of information' from the group discussions served as a means of monitoring what had happened since the implementation of the plan to teach Thinking Skills. This step, together with the reflection, could be said to coincide with the third and fourth stages of the action research cycle as described by Davidoff and van den Berg (1990: p40-46).

4.4.1.1 Administering a questionnaire

After the group discussion, the teachers were asked to fill in a questionnaire on what 'the curriculum' means to them. They were asked if they felt able to 'influence' the curriculum in any way, and, if so, how they could do this. They were asked to say how they would like to see the curriculum change. These questions aimed at probing teachers' perceptions of themselves as change-agents - an important aspect to the researcher - in school-based curriculum development. If a curriculum innovation such as the TASC project was to be effective, the self-concept and professional confidence of the teachers would play a vital

role. What was revealed by the questionnaire, however, was not taken any further (for example in follow-up interviews) but simply gave the researcher a clearer understanding of teachers' views on the curriculum in general, and how they perceived themselves in relation to it.

The administering of the questionnaire was a departure from the planned approach for the workshops, and did not fit in with the atmosphere of cooperative learning that was taking place. It was sensed that the teachers felt threatened - as though they were being tested - and that the questionnaire would somehow 'show them up'. The researcher regretted having used this research technique as the feelings of trust that had developed between her and the teachers were threatened. The teachers could not see the relevance of the questions to the teaching of Thinking Skills and this activity was not on the agenda for the Workshop.

4.4.2 Session 2

Two new Thinking Skills introduced

Comparing and Other Points of View were the two new skills to be introduced at this Workshop.

4.4.2.1 Comparison

A number of comparison activities were introduced. The first was a 'matching game' where each person was given a card with a coloured symbol on it. Participants moved

round, looking at one another's cards until they found a partner whose symbols matched their own in colour, shape and size.

In this way, criteria by which comparisons are made were discussed. Worksheets from the Somerset Thinking Skills Programme (Blagg et al, 1988) were completed, which further illustrated the comparison of objects along a number of different dimensions. Comparing two seemingly identical pictures was another activity. Candidates learnt that to compare involves looking for similarities and differences, and noticing what things have in common.

The rationale for teaching comparison as a Basic Thinking Skill was explained. In life one compares every time one makes a choice or makes a decision. The difference between description and comparison was illustrated.

Teachers then worked in groups on different topics:

- Group 1 Deciding which of two cars to buy (criteria for comparison were cost / comfort / speed / re-sale value / boot-space, etc.)
- Group 2 Deciding which of two holiday venues to choose. Criteria decided upon here were cost / distance / weather / activities offered etc.
- Group 3 Comparing two career options. In order to decide on a career the various options would have to be compared.

In each case the group decided on criteria. Once the teachers had practised the skills themselves in real-life situations, examples of children's work were shown on the overhead projector. These illustrated how comparison activities had been done in exercises relevant

to young children and how they could be built into regular school subjects. The Venn diagram was used for simple comparisons and a 'grid' for comparing across a number of dimensions.

4.4.2.2. Other People's Views

This skill was illustrated in a role-play where volunteers 'acted' the parts of various family members in a discussion of television viewing in their home. The viewpoints on preferred programmes and viewing times were given by grandmother, grandfather, mother, father, ten-year-old daughter and six-year-old son. By acting out this scenario, a recognition of different viewpoints was illustrated.

According to Williams & Sternberg (1993), the ability to see another's point of view is one of the seven essential lessons one can teach a person in order for them to reach their full potential - and is therefore one of the essential thinking skills to be included in any Thinking Skills programme. Feuerstein's Instrumental Enrichment programme includes this skill in the 'Orientation-in-Space' Instrument, while De Bono (Cort programme) and Wallace and Adams (TASC) consider this an essential thinking 'tool' called, respectively, 'OPV' and 'Other People's Views'.

Other suggested scenarios were to consider 'rain' from the points of view of children at a party, mother on washday and a farmer during the drought; or to consider 'party noise' to a party-goer, on the one hand, and a neighbour trying to sleep, on the other.

Teachers were then asked to think of ways to 'bridge' this particular skill into the curriculum. Some suggestions were:

In English

- Considering viewpoints of different characters in a novel;
- Taking a well-known folk tale and telling it from a different point of view;
- Taking poems on 'war' written from the points of view of a soldier, a victim, the enemy, etc.

In Current Affairs

- Controversial issues seen from opposing viewpoints.

In History

- Historical events/battles described from different points of view.

4.4.3. Overall summary of WORKSHOP 2 and arrangements for next school visit

The workshop ended with the researcher encouraging teachers to devise lessons for their classes, incorporating the Thinking Skills learnt so far. Participants were requested to prepare one Thinking Skills lesson each, specifically for observation by the researcher. This would give teachers an opportunity to try out new skills formally and to have feedback on their efforts. The researcher would arrange times to suit individuals without disrupting normal teaching time. The principals would be contacted for permission to do this, and, if possible, to arrange another meeting with the staff to share more Thinking Skills with them.

These arrangements constituted the 'revised general plan' for the next action research cycle. The observation of prepared lessons would provide the structure and impetus for teachers to incorporate the Thinking Skills into their teaching, and would provide an opportunity for 'feedback' and 'reflection'.

4.5 PHASE TWO: Follow-up school visits and observation of Thinking Skills lessons

As can be seen on the 'forward planner' for Phase Two, no contact was made with schools during the month of April. This was the month of the country's first democratic elections, and there was a large amount of uncertainty, disruption and tension in schools during the time leading up to the election date and until after the new State President's inauguration on 10 May. Contact with schools was resumed again towards the end of May.

4.5.1 School A: Implementation of Thinking Skills, observation and teacher interviews

26 May 1994

The following lessons were prepared by the project teachers and observed:

Std 4

English lesson - Thinking Skill : Comparison.

The children were involved in a number of activities involving comparison. The language structures and vocabulary of comparative thinking were practised. Charts and visual aids

were made.

- what is the same?
- what is similar?
- what is different?
- what do these two things have in common?

When comparing two children, the class spoke about their height, their clothes and their interests. This led into a lesson in the textbook on 'opposites' such as tall/short, fat/thin, happy/sad, etc.

Std 4

Maths lesson: Multiplication of fractions

The steps for addition and subtraction of fractions were revised, and then the new concept was introduced. No particular Thinking Skill was made explicit here.

27 May

Std 5

English lesson: Comprehension from textbook

The desks were arranged in groups, with each group given the name of a soccer team. The group names were written on cardboard and suspended from the ceiling above each cluster of desks. The children were asked to look at a sequence of pictures describing a story, and to say 'who was doing what'. No particular Thinking Skill was made explicit.

Std 4

Religious Studies (double period)

This lesson was given in the mother tongue (Zulu) and involved the Thinking Skill of Comparison. Pictures of two Old Testament characters were hand-drawn on posters and put up on the board. The children were given five or six questions (written out by hand - no photo-copying facility) about the two characters to answer in their groups. A spokesperson from each group reported back. Thereafter, a comparison grid was drawn on the board and the similarities and differences in character were elicited. The teacher then discussed when, in life, one uses the Thinking Skill of Comparison.

At the end of the lesson the children were asked to discuss, in their groups and in their own language, the following question posed by the researcher: 'What is the difference for you when you work in groups'? It was treated as a brainstorming exercise. The spokespersons reported back the views of their groups.

Some of the comments were as follows:

- 'it gives a chance to see if we are able to agree'.
- 'we like to discuss things'.
- 'it makes it easy to learn'.
- 'we get a chance to correct one another'.

4.5.1.2 Analysis

School A: Comments on the implementation of the Thinking Skills in terms of the TASC teaching principles

Two out of the four teachers **made the Thinking Skill explicit** and the aim of the lesson clear to the pupils. Two out of the four teachers used **group-work effectively**. Only one of the teachers **reflected** on the thinking process and explicitly taught for **transfer**. Three of the teachers adapted the **vocabulary** and the language level to **suit the learners**.

For all these teachers, the experience of having to prepare a lesson for critical observation could have been threatening. However, the spirit of cooperation and the willingness to have critical feedback was genuinely felt by the researcher. The teachers had consciously tried to apply the TASC principles in their lessons, but without this disrupting their normal teaching schedules. As no duplicating facilities exist for the teachers, activities for group-work were hand-written six times to enable each of the groups to have a copy.

Perceptions of the TASC project gained from teacher interviews

(See Appendix 6 for questions asked in semi-structured interviews)

Benefit to teachers

The teachers interviewed all felt that they had gained much from **working collaboratively** at the workshops with other racial groups. They enjoyed sharing how TASC could be applied to their different subjects. They gained from **having had the Thinking Skills made**

explicit:

We were using the skills but we didn't know what they were'.

Difficulties

It was difficult to implement Thinking Skills and to do group work when there were no photo-copying facilities. Writing things out by hand was time-consuming. Without worksheets it was difficult to do some of the lessons.

Children's response

The children were reported to be 'showing more interest' and 'asking more questions'. 'Grouping may be the solution to better understanding of the pupils'.

Co-operative planning

Very little co-operative planning was done between teachers at this school, but teachers were sharing TASC ideas with spouses and teachers on other courses. (Interview with Teacher 4 on 27 May)

Support of principal

The principal was perceived as very supportive and encouraging.

4.5.2 School B: Implementation of Thinking Skills

2 June 1994

The following lessons were prepared and observed by the researcher (double period

lessons):

Std 5

Science: Comparison of vertebrates

Problem-solving exercise: Classification and organisation

The children worked co-operatively in small groups in all three activities. (See Appendix 7 for sample worksheet given out by teacher)

Std 5

Geography: Comparison and Points of View

The children were asked to compare the criteria by which different roads are named. Thereafter they worked in groups on a problem-solving exercise involving the position of a new road to be built to alleviate traffic problems in a sea-side town. Each group represented a different view-point on the matter.

Std 5

Health/English: Thinking Tool - Brainstorming

The teacher used this technique to share her aims for the next module with her class. The class were involved in a group brainstorming session on the topic of drugs. The teacher recorded the ideas on the board. Thereafter, each group was given one aspect of drug abuse to discuss. Each group had a spokesperson to report back.

4.5.2.1 Analysis

School B: Comments on the implementation of the Thinking Skills in terms of the TASC teaching principles

In each case the teacher started the lessons with an exercise to ensure **motivation**, creating the expectation that some specific type of thinking would be addressed. The Thinking Skills were named (**made explicit**) and the lessons engaged the pupils in activities which provided experience in them. All work was **co-operative**, and the pupils who reported back did so confidently. The teachers were involved in the sense of being 'guide' or 'manager', moving between groups and encouraging autonomous **thinking**. (**TASC teaching principle No.6**) One of the teachers made specific reference to the recording styles of the groups and how they went about their thinking (**metacognition**), but none of the teachers mentioned the relevance of the **type of thinking** in everyday life (**transfer**).

The researcher, as participant observer, acknowledged the classes for their '**thinking efforts**', their cooperation in the groups, and for the clarity of their report-backs. In addressing the children about their thinking she modelled for the class teachers the kind of language used in **teaching for transfer**:

- 'In what situation do you think you could use this kind of thinking? Think of a time at home when it would have been useful to see things from another's point of view'.
- 'When would it help us to 'categorise'? etc.

Thus the teachers received an indirect form of feedback in the modelling of the transfer aspect, as well as in discussion afterwards. The preparation in all three cases was extremely thorough and each lesson could be considered a 'model Thinking Skills lesson' in terms of content and methodology.

4.5.3 Inability to gain access

The researcher was not always able to gain access for follow-up visits in each school. Keeping up the contacts and momentum was difficult : sensitivity to the everyday pressures of schooling had to be balanced with the desire to keep up the relationships with teachers and their interest in the project. For the researcher, the project was all-important, while to many teachers it may have been perceived as an added pressure, if too many demands were made on their time.

4.5.3.1 School C

This school was not visited during Phase Two. Contact was maintained by telephone. The TASC delegates were unable to commit themselves to a date for the teaching of a Thinking Skills lesson as they were both involved 'in other courses'.

4.5.3.2 School D

There was no follow-up here in Phase Two. A consultant was working with the Std 4 and 5 classes on a series of 'study skills' during the second term. This was seen as

complementary to the TASC project as the teachers and pupils were being taught 'mindmapping' techniques and how to apply these to research, data-gathering and project work. The TASC teachers were involved in this and were reluctant to give any more of their time for TASC follow-up.

4.5.3.3 School E

Attempts to make appointments to visit School E were unsuccessful. Visits scheduled for 20 April, 25 May and 3 June were all cancelled. (See Phase Two forward planner). The researcher wondered whether the request to observe a Thinking Skills lesson was not premature in this case or too threatening. The teachers had had little or no opportunity to attend in-service courses, and the little exposure they had had to the TASC project may not have empowered them sufficiently for autonomous action which demanded changes in methodology. Given the sense of isolation and lack of confidence in their own teaching abilities as expressed during the first school visits it may have been more appropriate to model Thinking Skills lessons for them in various classes. They had been very enthusiastic at the idea of 'help with their skills', but may well have been reluctant to be observed at this stage.

4.5.4 Analysis

Overall summary of Phase Two

4.5.4.1. Summary in terms of observations and interviews

Where the observer was able to observe lessons in action, the evaluation of the teachers' ability to apply TASC principles to their normal subject matter was very positive. The difficulties of developing metacognition and teaching for transfer were the major problems. Co-operative learning in small groups was difficult where the teachers had no facilities for duplicating worksheets. (Compare the prepared lessons typed and duplicated from School B - Appendix 7 - with the hand-written questions for group discussion as described for School A). However, the theoretical aspect of teaching for thinking seemed to have been grasped by five out of the seven teachers observed. In the case of Schools C, D and E, observation of Thinking Skills lessons would take place in the next phase.

4.5.4.2 Summary in terms of the action research design

This phase completed the first action research **spiral** (see figures 1 and 2 at the end of this Chapter). Davidoff and van den Berg (1990: p46) describe a spiral as consisting of four stages:

- the general plan
- implementation
- observation
- reflection

In this study each of the above four stages was loosely followed **within a Phase** which could be said to constitute a micro-cycle. But in terms of a broader view (macro-cycle or full spiral) Phase One only covered 'the general plan' and 'implementation' stages. As each school progressed at different paces with the implementation, Phase Two was necessary for meaningful 'observation' and 'reflection'. Thus it was felt that **two Phases** more accurately describe **one complete spiral**. During Phase Two the researcher aimed at actively understanding what had happened since the plan to introduce Thinking Skills into the curriculum had first been put to the teachers. She was able to 'monitor' and assess how things were going. By the end of Phase Two the researcher had gathered much more data and was in a better position to **reflect critically** and to 'critically evaluate' the progress of each school and her own progress in conducting the research.

Where Phase One constituted the fact-finding, planning and implementation stages of the action research cycle, Phase Two completed it by observing, monitoring, evaluating and reflecting on its success. Phases One and Two therefore formed the first full action research **spiral** before the process would begin again.

Planning for the second action research spiral

Significant factors that emerged from the data-analysis of Phases One and Two were kept in mind when the new, revised 'general plan' was devised.

The researcher would give more input at the next centralised Workshop on TASC **theory**. Special instruction on metacognition and **teaching for transfer** would be given as these were the weakest aspects of lessons observed. The modelling of these aspects would be

important when introducing the new Thinking Skills. The ten TASC teaching principles (methodology) would be revised, with feedback on observations. The participants would be required to plan 'bridging' lessons co-operatively - i.e. they would devise ways to integrate the new Thinking Skills into their subject matter collaboratively. The teachers would be made aware of their own learning processes and given time to reflect on them. Teachers would be shown how to use the TASC Problem-Solving Model in practical activities, drawing on the Tools for Effective Thinking and the Basic Thinking Skills learnt.

End of Phase Two

(See forward planner overleaf for Phase Three)

FORWARD PLANNER: PHASE 3

SCHOOL	8 JUNE THIRD CENTRAL WORKSHOP	Mid-year vacation: June/July	FOLLOW-UP SCHOOL VISITS	Implementation of new skills Monitoring Analysis of Observations and Interviews	HOW CAN WE IMPROVE?
A	12:00 – 12:30 Tea and sandwiches 12:30 – 15:30 Report-back on school visits		18 August 13:00 – 14:30 Staff workshop Group Thinking Skills exercises and problem-solving	Summary for School A	Overall summary of <i>Implementation</i> Observation and Interviews
B	Enviro-picture Building game: Problem-solving in the environment		No follow-up	Summary for School B	
C	Group activities: How to prioritise Using the problem-solving model Theory, followed by practical group activity		28 July 10:00 – 12:30 Observation: Teacher 1, Teacher 2 Taped interviews with both teachers Unstructured interview with principal	Summary for School C	First Action Research Step * Look at the new situation * Give more input on the <i>new idea</i> (thinking skills) * Back practice with theory
D	Report-back The importance of metacognition Revision of the 10 TASC teaching principles		4 August Interview with principal 9 August 09:00 – 12:20 Taped interviews with Teachers 2 and 3 Observation of Thinking Skills lessons and classes	Summary for School D	
E	Trial materials handed out Thinking skills lesson notes (3 hours)		26 July 11:30 – 13:00 Unstructured interview with principal Observation: 2 lessons Teacher 1, Teacher 3 – taped lessons 2 August 12:30 – 13:30 Staff group workshop Teachers 2 and 4 – Interviews and observation	Summary for School E	Assessing responses – Change –

4.6. PHASE THREE

Introduction

This phase consisted of the third centralised Workshop at which new elements of 'the general plan' were introduced. These were the use of the whole Problem-Solving Wheel (Wallace and Adams, 1993: TASC, p92) and the handing out of draft TASC materials for trialling (Evans and Wallace, 1994: in press). Four out of five schools were visited in this Phase. School A advanced further in that another 'on site' staff workshop was arranged, while observation of Thinking Skills lessons and interviews in Schools C, D and E which were not done in Phase Two were completed. There was no follow-up in School B in this phase.

4.6.1 WORKSHOP 3

Teachers were welcomed by the chairman of the Inter-Departmental Network Committee.

4.6.1.1 Report-back on school visits

This started with a report-back on school visits. The researcher shared with the delegates the very successful Thinking Skills lessons observed. Charts and children's work were displayed, showing how the skills had been integrated into regular subject matter. Other teachers reported back on successful lessons. A summary of the skills of Comparison and Other People's Views covered at the last workshop were given out.

4.6.1.2 Enviro-picture building game

This was played in teams and was led by a member of the Environmental Education Initiative, using their materials. Players had to look at a picture, identify an environmental problem, and then find a picture which contained an appropriate solution. The skill of **problem-identification** was emphasised as an important stage of the TASC **Problem-Solving Model**.

4.6.1.3 Prioritization: A Tool for Effective Thinking

Groups were presented with an exercise that would be relevant to the majority of school children. They had to **prioritize** in order to decide how best to spend money that had been saved. Each group reported back, ranking ideas according to the importance of the person considered or the item to be bought.

The **process** of each group's thinking was described. Creativity was acknowledged where good or unusual ideas saved money. Other groups went about the process very logically. 'Thinking about the thinking' was highlighted as important in its own right. The issue of 'no right or wrong answers' was also discussed. In modelling how to teach for **transfer**, the researcher asked for other situations where it would be important to 'prioritize'. The suggestions were given as follows:

- when a person has a whole list of things to get at the shops;
- maintenance in the home : what does one tackle first?
- family time : how and with whom to spend it.

4.6.1.4 The TASC Problem-Solving Wheel and how to apply it in a problem situation (see figures 5 and 6)

Groups were given different problem situations and used the eight stages of the Problem-Solving Wheel to guide discussion. The problems were:

Group 1: Planning Open Day for parents;

Group 2: How can we make our playground more interesting?

The researcher and a colleague facilitated discussion by guiding the participants through the stages of the problem-solving model and by identifying the thinking skills being used:

Stage 1. Gather and Organise the information given: record in key words; explore; consult; question

Stage 2. Identify the problems: state obstacles and goals

Stage 3. Generate ideas and possible solutions: brainstorm; consider options and alternatives

Stage 4. Decide on action to be taken: consider consequences; predict; plan your starting point

Stage 5. Implement: monitor; check

Stage 6. Evaluate: assess effectiveness; revise

Stage 7. Communicate to others: justify the process

Stage 8. Learn from experience: analyze; improve; revise

Groups 'communicated' their solutions to the audience and described the process of their thinking.

DETAIL OF THE SELECTED TOOLS FOR EFFECTIVE THINKING AND THE PHASES OF THE PROBLEM-SOLVING MODEL

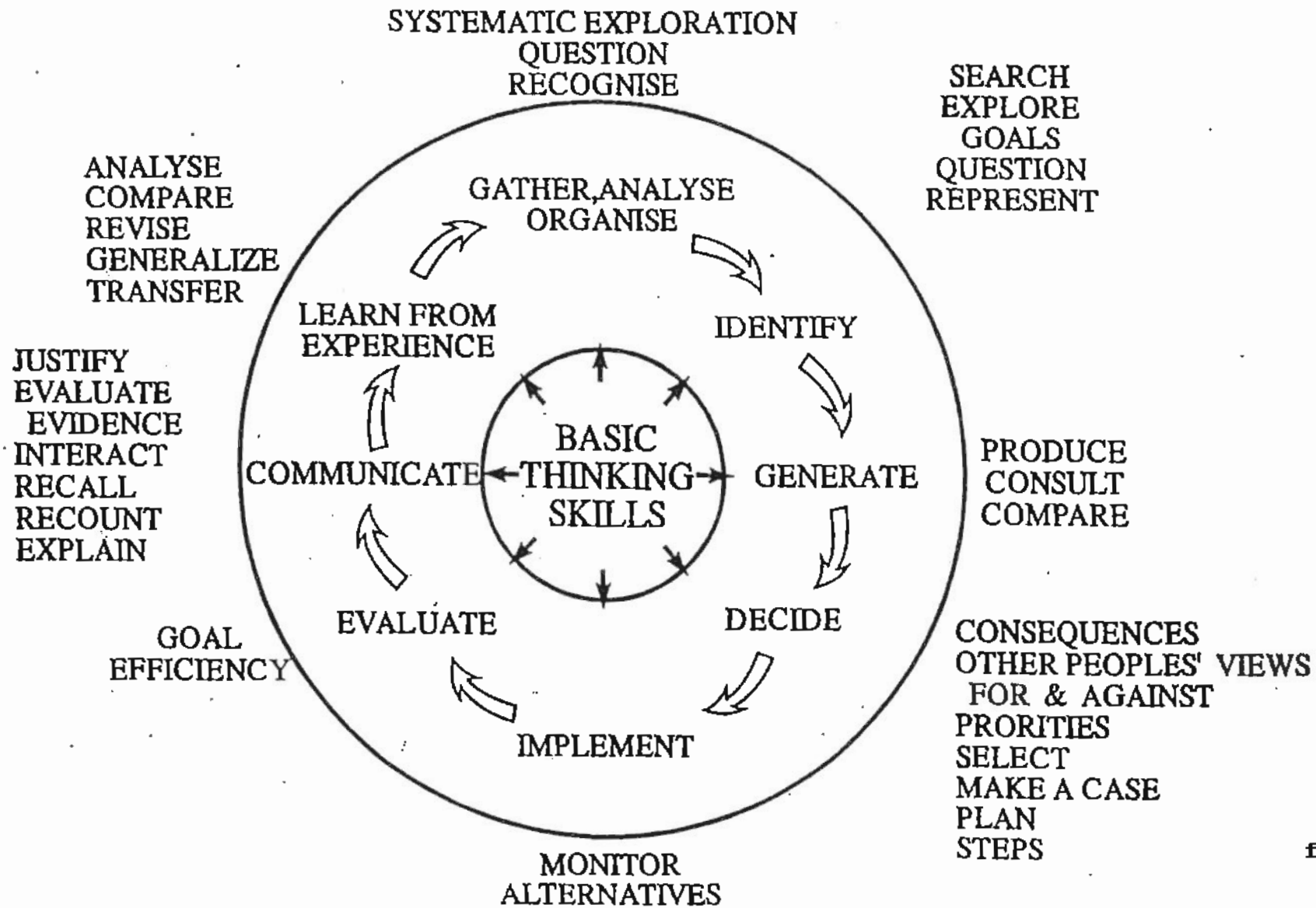


figure 6

4.6.1.5 The importance of metacognition and transfer

After each exercise the groups were given questions to monitor their thinking:

- How have we worked?
- What have we learned about ourselves?
- How could we use this skill in everyday life?

The ten TASC teaching principles (Wallace & Adams, 1993) were revised, discussed and clarified in the light of the Thinking Skills lessons observed and the exercises done. Adopting a model of the problem-solving process (TASC principle no. 1) now became more meaningful. A summary of the principles was given out as well as a note on the importance of metacognition. (See Appendix 8)

4.6.1.6 TASC materials for trialling

Thinking Skills lessons using the TASC framework were handed out for trialling in the schools. The lessons were on brainstorming, and seeing other points of view, using the environment as a theme. They were devised by the researcher and based on ideas discussed at the Workshops. Each lesson had a teacher's page and a pupil's page. It was hoped that, given sample lesson outlines, the teachers who had not yet attempted any Thinking Skills lessons with their classes, would now be encouraged to do so.

4.7 PHASE THREE; Follow-up visits to schools, staff workshops, observation and interviews

4.7.1 School A: Third school visit, 18 August

A staff workshop was held after school for an hour and a half. Eleven senior primary teachers, including the principal, were present.

In order to assess the general understanding of TASC among these teachers and the impact (if any) it had had on them, groups were asked to say what they perceived the project to be about. The four TASC delegates were able to give their input and so share their understanding with their colleagues (co-operative learning and building self-confidence). An analysis of their perceptions revealed a good balance between cognitive, social and affective ideals for teaching and learning (see Appendix 9).

Group problem-solving activities were given out. (See Appendix 10 for 'the canoe problem' and 'a maths problem' taken from Fisher, 1987: p87-88). There was a buzz of interaction between the teachers as they worked. Metacognitive aspects of the exercise and the value of co-operative learning were discussed. Copies of the **Problem-Solving Wheel** were given out and strategies for tackling problems when 'stuck' were discussed.

4.7.1.1 Analysis

Summary of responses and signs of change - School A

This second staff workshop gave the teachers another opportunity to experience interactive learning and group work. If they were to have the confidence to try new methods in their teaching, it was important that they participate as 'learners' in a similar way. Their comments about TASC showed an understanding not only of the Thinking Skills but also of the need for more active learning and involvement on the part of the children. In terms of a more 'enabling curriculum' (Chapter Two: 2.8), this showed a small but positive shift away from the traditional view where the teacher possesses the knowledge and power while the children passively receive and obey.

Having the principal participate with his staff in all TASC activities was a positive factor in terms of school based curriculum development (Brady, 1987) and had a significant effect on the enthusiasm and attitudes of teachers in this school to the TASC project.

4.7.2 PHASE THREE: School B

There was no school visit in this case.

4.7.3 PHASE THREE: School C

Second school visit, 28 July, 1994

Observation of Thinking Skills lessons and interviews

The following lessons were prepared by the project teachers and observed:

4.7.3.1 Thinking Skills lesson - Prioritization

Std 5 Geography: Population Settlement

(This lesson also involved **brainstorming** and **points of view**)

The children were put into four groups representing the following:

- farmers
- teenagers
- factory owners
- shop owners

They were to imagine that they were re-locating and had to consider all the factors involved in choosing a new area. What would they look for? What were the six most important reasons why people move and settle in a particular place? The children brainstormed for about five minutes, with the teacher walking between groups. A spokesperson from each group reported back, displaying their recorded notes and giving reasons for the way they had prioritized. In this way a section of the Geography syllabus was addressed but 'it came from the children; they deduced the principles' (Quote from the teacher when reflecting on the lesson). There was a very comfortable feeling in the class. The teacher's manner was facilitative and democratic. He inspired confidence and acceptance. He gave time at the end for reflection on the thinking process and taught for transfer.

4.7.3.2 Thinking Skills lesson - Mind-mapping and classification

Std 5: General Science

The teacher started by establishing what was known by the class about animals. He carefully linked what they knew with what they had recently covered in Science ('scaffolding' - Wallace & Adams, 1993: p18). Eight groups of four pupils were given lists of animals to classify. They were required to put animals together in groups according to certain characteristics which were elicited from the pupils. They worked on large sheets of newsprint with coloured pens. Each group had a turn to report on their method of grouping and gave reasons for it. The teacher constantly **mediated meaning** where words were not understood, or encouraged children to learn from one another. (Many of the children were Zulu-speaking and had difficulty with words like 'crustacean', 'shrimp', etc., which were outside their life experiences). The groups' mind-maps and classification charts were displayed and discussed. There was dynamic interaction between the pupils and the teacher. He told them that the lesson was also preparation for a trip to the museum (relevance).

4.7.3.3 Analysis and comment

The interviews with the teachers here revealed a great enthusiasm for the teaching of Thinking Skills and for the TASC methodology. They both commented on improved confidence in the children:

They seem to be coming out of their shells.

It's also a confidence-builder (group work) without a shadow of doubt.

It was not easy for these teachers to share their enthusiasm with other staff members because of

- lack of leadership from the top (the principal and senior staff did not attend the workshops);
- indifference / lack of motivation on the part of the staff; and
- not enough time at the staff meeting (for the facilitator to have impact).

These factors would therefore militate against school-based curriculum development being promoted in this school. What the teachers shared in their interview as limiting, was corroborated in the researcher's own unstructured interview with the principal. The researcher was unable to arrange another staff workshop as it was 'athletic season', the staff were 'very busy', etc. (Quote : school principal)

4.7.4 School D - second school visit / observation of Thinking Skills lessons and interviews

4.7.4.1 Thinking Skills lesson - Organisation

Class Two: 'Planning our sports day'

The teacher started the lesson by reading a newspaper report to the class, who were all seated on the mat at her feet. From this report on an athletics meeting, she led to the purpose of her lesson: the decision to allow the children to plan their own sports day. The children worked in groups, discussing their plans. Contrary, however, to encouraging autonomous thinking on the part of the pupils, this teacher rigidly structured and controlled

all the thinking. She stuck 'clues' or sub-headings on the board, indicating the questions which had to be asked, and expected the pupils to think in that order.

Creativity was stifled by the teacher's natural desire to be in control. She did acknowledge good, divergent ideas, but quickly brought the children back to her preconceived list of things to discuss:

e.g. Child : 'We can sell super-cools'.

Teacher: 'We'll get to that later; now what are we going to wear'?

or

Child : 'We can have an apple and icing-sugar race'.

Teacher: 'Put that down, but we'll go through the list of races later'.

In the interview, this teacher reiterated the need to 'give clues along the way just to structure the activity'. She admitted 'not arriving at what I intended for them to arrive at' and said she learnt what was important to them. She acknowledged that the children generally are 'not encouraged to think':

They tend to be told everything, and that's what they're accustomed to. They're told to do something, and if it's not done they're reminded and told again, and then eventually it's done for them - so they don't ever have to think anything through ...

It was suggested here, in the feedback on the lesson, that brainstorming ideas could have been totally unstructured. Groups could then have arrived at their own category headings -

such as:

- 'When to have it'
- 'Whom to invite'
- 'What races to have', etc.

It was felt that this teacher, while recognising the fact that children are not encouraged to think for themselves, found it difficult to 'let go'. This was a class of seven and eight year olds whom she regarded as 'very young for Thinking Skills'. She was used to rigid structuring in her teaching and would have to change in order to teach for thinking in the TASC way, as this requires a shift from an authoritarian manner to one which facilitates discussion and debate:

A teacher's role must be one of modelling approaches to learning through which questioning styles and problem-solving approaches convey the necessity for personal enquiry and questioning. (Wallace and Adams, 1993: p10)

The lesson in terms of preparation, planning and structure was extremely thorough. However, the rigid control of the children's thinking served to perpetuate the kind of linear, logical, sequential demands of the traditional classroom at the expense of real creativity, discussion, intellectual risk-taking and co-operative learning.

4.7.4.2 Thinking Skills lesson - Prioritization

Std. 3: English

The teacher planned that the children and researcher would be seated so that she could enter the room 'acting out' the role of a flustered, over-worked teacher, carrying a pile of

books with a file on the top marked 'URGENT'. She shared with the children her difficulties:

- trying to be a good mother
- trying to be a good daughter to her elderly mum
- trying to fit in important things in her private life while the demands of teaching, marking, taking sport, attending meetings, etc., were constant.

The children were to help her **prioritize** and to rank all the things she had to do in order of importance, time taken, etc. They were given her 'list' of 'things to do'. They were to read them, look at the deadlines and decide what to do first, second,...last etc., and give reasons. The children worked in their groups for five minutes. The teacher constantly mediated the importance of **working co-operatively** to help one another ('respect one another's ideas' / 'decide together' - 'you don't have to agree'). While they had all been very enthusiastic when they were told what the lesson was about there was resistance to group work ('Ah no!'; 'Group work is boring!'). When asked if the group had reached consensus one child irately commented 'No, he decided..' It appeared that these children were unused to any form of collaborative learning. Like the children observed in this school in Phase One, they seemed motivated by individualistic achievements. This could be because of the system of competing for marks, making any other kind of activity intrinsically unrewarding or unmeaningful.

In terms of the TASC teaching principles, this teacher:

- identified the Thinking Tool being taught and embedded it in a problem-solving situation;

- used a relevant example (vocabulary suited to the learner and motivational);
- taught it with transfer in mind (When interviewed she said that she was going to get them to discuss priorities for different farmers in Geography);
- paid attention to self-monitoring and metacognitive aspects; and
- encouraged a co-operative learning climate despite the resistance described above.

The pupils' reaction (according to the teacher when interviewed) was:

amazing. They came to life. They were wonderful.

In the interview which followed she said that she was prepared to risk the noisiness of the discussion for the sake of the thinking. The fact that she acknowledged their liveliness suggested that not much time is given for interactive learning of this nature in the normal course of events. The reaction to group work as described above and as observed by the researcher and corroborated by the teacher in the interview, seems to suggest that these children are used to an individualistic, competitive working environment. Wallace suggests that this is quite common in schools and advocates a shift to more co-operative leaning experiences:

Most school-based learning has a powerful message which says "learning is for your personal benefit alone". Learners are expected to work in silence on their own; they are not encouraged to work co-operatively; the strong are not expected to help the weak. Yet education for democracy can only be developed through pupils interacting with one another, through group work, through co-operative assignments. Even a few minutes spent with pupils explaining to one another or teaching one another gets the message across that "we are learning together for our mutual benefit". (1993: p15).

4.7.4.3 Analysis

Summary of observation and impressions at School D

The teachers here appeared to be extremely self-confident. Their lesson preparation was thorough, and they were attempting something new with great enthusiasm and determination. There was a feeling that they were autonomous in their actions, with no constraints other than the pressure of time. The Thinking Skills merely increased their awareness of their own teaching styles. The day was thoroughly organised : teachers were at classroom doors after breaks to see the children in promptly, etc. There was generally an air of efficiency and busyness amongst pupils and staff. The responses of the children to the Thinking Skills lessons and the insight gained by the teachers into how and what they learned would be reflected on at a later stage.

4.7.5 School E - second school visit, 26 July 1994

Thinking Skills lesson - Observations

I arrived at this school at 10:30. This was to be a full day of observing and interviewing the TASC project teachers, followed by a meeting with the staff. However, in stark contrast to the atmosphere of School D described above, this did not happen. The day was bitterly cold and rainy, with a searing wind. All the children in the junior primary section had been sent home because they had arrived at school wet and cold. (All children here walk to school). The principal had promised the staff and the rest of the school an early closing day (12:30) because of the weather. The arrangements for the afternoon staff meeting were thus postponed, and only one lesson was observed before closing time.

4.7.5.1 Thinking Skills lesson - Comparison

Std 3: English (Second language) lesson

There were only 23 children present out of 45 because of the weather. The teacher was clearly nervous and worried about the lack of language competence in the children. Two children were called up to the front and the class were asked to describe them. 'What can you tell me about these girls'? A grid was drawn on the board:

	<u>Patricia</u>	<u>Zandile</u>
height	tall	taller
complexion	lighter	light
dress	skirt	gym
shoes	black/shoe	sandals
socks	black	white

The children had great difficulty with the language. The comparison was laboured and went on far too long. The girls at the front were tired and the rest bored. Each question was repeated by the teacher three times.

e.g 'Are the shoes the same?' (Only 'Yes' or 'No' answers were offered).

'What else is the same'?

The teacher constantly shouted, 'Speak up!' 'Hands up now!' 'Say something! Say something!' Each sentence attempted by a child was corrected for grammar and then drilled and repeated by the class three or four times.

e.g. 'Patricia's complexion is lighter than Zandile's'. 'Say that'.

The words 'complexion' and 'light' were not explained. Only three children were called on to speak - the three most competent - while few others had a chance to try. No attempt was made to let the children work in groups or to explain the point of the lesson in the mother tongue.

This lesson demonstrated the difficulty these children experience learning in English. It confirmed the observations made in Phase One at the school, and also confirmed the rote-learning aspects and passivity of a 'disabling curriculum' (Chapter Two). The teacher had not changed her methodology and the Thinking Skill became just another irrelevant, meaningless lesson in the lives of these children. There was no positive input at either the cognitive or the affective level.

The researcher made arrangements to come the following week to complete the observations and interviews.

4.7.5.2 Thinking Skills lesson - Comparison

Std 4: General Science - Reproduction in animals and birds

This was a brave attempt from a very enthusiastic teacher. The problems of English as the medium of instruction in content subjects in a school where the children hear no English in their homes were evident. This teacher encouraged each child to say something - acknowledging all attempts, even though some could give only one-word answers. She modelled a thinking atmosphere in the classroom. She used a comparison grid as a graphic/visual organiser. However, it was often apparent that the children did not understand the questions asked : e.g. 'Who looks after the young'? 'Who does the parenting'? They did not understand the word 'who'. However, the children worked in groups, discussing and marking in different colours the similarities and differences. In some cases they were helped in the mother tongue. Their report-backs were severely hampered by lack of language competence. It would seem that the only way these children would cope with the content of the science syllabus in English would be by learning the words and facts by rote from the textbook (Ausubel, 1985).

4.7.5.3 Thinking Skills lesson

Std 5: General Science - Magnetism

This lesson also demonstrated the difficulties of interactive group work when children have little command over the language. The concepts were well understood, but could not be described. This led to boredom with the content and frustration at not being able to express what was known. The teacher was demotivated by having to try to extract answers from

pupils reluctant to talk. No particular Thinking Skill was made explicit in this lesson.

4.7.5.4 Analysis

Summary of observation and impressions from interviews

The researcher was struck by the debilitating effects of teaching and learning in a language that is not one's own. Cognitive development must be impeded when meaning, understanding and thinking are secondary to being able to say and write the correct words. Both teachers and pupils were trying to work in a second language. The content had to be put across and the language for this had to be taught at the same time. Children who made errors in language were dismissed, and only children who could express themselves better were called on. In two out of the three lessons observed there was no building of self-concept in the majority of children, little cognitive structuring, no questioning that leads to understanding and no feedback or use of errors to enhance meaning.

All three teachers interviewed stressed that the main difficulty with implementing Thinking Skills was that of the language. One teacher described his attempts as 'failures'. He intimated that the whole effort of this curriculum innovation was futile if it was to be done in English. When asked what would happen if the same lessons were given in Zulu he replied:

Well, then I think it would be successful - because they understand..

The difficulties in training metacognitive aspects or teaching for transfer are self evident when struggling with the language for the purpose of teaching content. Perhaps not enough

attention was given to these aspects as fundamental educational ideals.. (See limitations of the study: Chapter Five). The other teachers re-iterated the problem but were more optimistic. On the issue of collaborative learning it was felt that the children here were not used to any kind of interactive learning, let alone group work requiring discussion in English:

The problem is the language. Some of them just fear to utter a word. Some are shy to speak, even in Zulu. To stand up and say something is very difficult. Some, even us... [teachers]... we are not used to it... but it will get better with time... we'll get used to it.

However, teachers did report enthusiasm on the part of the pupils when encouraged to work together:

They like it...though not so good at talking... they do understand that they can get information from others.

The difference between this school and School A, where the children were also working in their second language, was that these rural children very seldom hear English spoken. They have no outside stimulation such as television, and in fact there was very little up on the walls to add visual clues to what was being taught. The teachers' own use of English was limited in two out of the three cases observed.

4.7.6 Overall summary of PHASE THREE and Analysis of findings

By the end of Phase Three teachers in all schools had been observed giving Thinking Skills lessons. The researcher focused on providing opportunities for her subjects to develop their professional knowledge and to improve practice by implementing some of the theoretical

ideas and practical activities presented at the Workshops.

The question of whether the teachers were able to transfer skills learnt at the Workshops to their classes is the main focus of this study. From the observation and the interviews, it was apparent that most of the teachers were attempting to integrate the Thinking Skills with their subject content. Their ability to bring in appropriate skills and to structure the lessons for maximum student participation was pleasing. There seemed to have been a positive shift on the part of most teachers from the transmission mode of imparting knowledge, to encouraging the children to discuss and learn co-operatively. It was only in School E where there was a real problem in the lack of communicative language competence which constrained the teacher's attempts to introduce Thinking Skills and the TASC methodology. But in terms of small incremental changes, which is what TASC aims for, these were positive both for the teachers and for the pupils.

This phase could be likened to the 'programme-building' stage of Skilheck's SBCD model. The teachers had been given TASC materials for trialling. These consisted of Thinking Skills lessons with a Teacher's Page suggesting the structure and the method to be used, with emphasis on time for reflection on the thinking process. The Pupils' Pages provided simple activities which emphasised the process of the thinking, rather than an end product. These materials, (the TASC Starter Kit - Evans and Wallace, 1994 in press) provided teachers with something tangible, reflecting closely the activities and methodology to which they had been exposed during the project. They would serve as examples of the kinds of lessons that teachers could prepare when devising or building their own Thinking Skills programmes.

The researcher's interaction with the teachers, both at the Workshops and then in their classrooms, aimed at encouraging and assisting them to introduce small but appropriate changes in their teaching, in the way they treated syllabus content and in the way they viewed the curriculum as a whole. It provided the opportunity for them to reflect on their practice and to consider whether their learning experiences during the course of the project were intrinsically worthwhile. There was a definite commitment to the project on the part of the researcher and the teachers, and the relationship between them in Phase Three continued to be positive, dynamic and interactive.

The introduction of Problem-Solving as an approach that could be applied across the curriculum, provided the thrust for the new action plan in terms of the second action research spiral. It was crucial during this Phase to keep up the momentum, the interest and the challenge of the curriculum innovation on a school based level.

End of Phase Three

(See overleaf for forward planner for Phase Four)

FORWARD PLANNER: PHASE 4

SCHOOL	24 AUGUST FOURTH CENTRAL WORKSHOP		SUMMARIES Professional Development and Growth of Teachers	HOW HAVE WE DEVELOPED?
A	12:00 – 12:30 Tea and sandwiches 12:30 15:30 TASC theory revised Three-tier model BST / T/E/T and P-S W Report-back on visits	Opportunity to reflect	Summary for School A	Overall summary of professional development, growth and change
B	Feed-back on lessons observed Examples of skills tried given by teachers (volunteered) Transfer	Feed-back on "Reflections" received from all three teachers	Summary for School B	Third Action Research Step * Gather information on progress * Actively understanding what has changed
C	A group activity 6 Thinking hats Points of view Different kinds of thinking for different purposes Prediction: What if ... ? Why teach problem-solving? Example of bridging into everyday life:	Opportunity to reflect	Summary for School C	Fourth Action Research Step * Reflecting on the process (Researcher) * Reflecting on our practice (Teachers)
D	Maths Science Poster and mottos (group) Certificates Materials H/O	<i>16 September</i> Staff lecture Report on the project and networking TASC theory / Some thinking skills and examples / Problem-solving	Summary for School D	Making recommendations for future planning
E	(3 hours)	Opportunity to reflect	Summary for School E	

4.8 PHASE FOUR

4.8.1. Introduction

Phase Four was the last stage of the project and provided the last opportunity to gather information on the progress of participants. The researcher was concerned with actively understanding what had changed in her subjects' perceptions of themselves and of their practice. This would be done through feedback from the teachers at the final Workshop. While some new Thinking Skills were introduced, the main purpose was to reflect as a group on TASC theory now that teachers had spent time trying to put it into practice. The researcher aimed to synthesize for participants the seemingly disparate skills learnt during the course into a meaningful whole i.e. the repertoire of skills acquired separately could now be drawn on in everyday problem-solving situations. Adopting a Problem-Solving approach in different subject areas was suggested as a means of unifying the primary curriculum (Fisher, 1987), where activities requiring higher order thinking could be incorporated alongside regular 'knowledge-giving' instruction.

There were to be no more school visits except to School D, at which a staff workshop (not held earlier in the year) was arranged. The final contact with participants was a letter thanking them for their co-operation during the year. A form was enclosed, inviting an open-ended response to the project. It was headed 'Reflections on the TASC project and on my own teaching practice'.

4.8.2 WORKSHOP 4: 24 August, 1994

As this was to be the last Workshop of the TASC Project, the intention was to recapitulate on the **theory** of the model and to demonstrate to the teachers how they had put it into **practice**.

4.8.2.1 Session 1

The slides of the **three tiers** of the TASC working model were shown on the overhead projector:

- First tier - The Basic Thinking Skills
- Second tier - The Tools for Effective Thinking
- Third tier - The Problem-Solving Wheel

The **methodology** of TASC, summed up in the **Ten TASC Teaching Principles** was revised and commented on in the light of lessons taught and observed.

Teachers were reminded that TASC is a framework which can be used by school advisors, administrators, principals or themselves for developing the curriculum and improving teaching and learning. It provides a way of extending the learners' **Basic Thinking Skills** into a repertoire of **Tools for Effective Thinking** which can be drawn upon when confronted with problems in real-life or in academic subjects.

The previous Workshop had seen the teachers 'prioritizing' in real-life scenarios and

solving problems by working through the eight stages of the **Problem-Solving Wheel**. Report-backs on lessons taught since the last meeting illustrated that teachers had tried the following skills with their classes :

- ranking in order of importance
- planning and organising
- categorising and classifying
- seeing other points of view

The skills of 'prediction' or 'hypothesizing' were then introduced and practised in a number of 'What if.....?' questions. Examples of children's 'What if...?' ideas were illustrated on the overhead. The creativity, logic and independence of children's thoughts were discussed.

'Considering consequences' was another **Tool for Effective Thinking** that could easily be made relevant to young children, as illustrated in the TASC Starter Kit.

Active Participation

Teachers were then introduced to de Bono's 'Six Thinking Hats.' This exercise was used to show how different **kinds** of thinking can be called for in problem situations. The topic was 'The Truck Drivers' Blockade of the Motorway'. Each group was nominated a 'coloured hat' to represent a different viewpoint on the matter. This exercise also served to illustrate the Thinking Tool 'Other People's Views'.

4.8.2.2 Session 2

The second half of the Workshop was given to a presentation on 'Adopting a Problem-Solving Approach in the Primary Classroom.' Examples from Robert Fisher's book on the subject were used (Fisher, 1987) for group activities. A problem in Maths, one in Science, and a problem-solving approach to a language theme were demonstrated.

The importance of specifically teaching for **transfer** was emphasised: teachers were shown how to create opportunities for practising the Thinking Skills in as wide a variety of contexts as possible. The importance of a whole-school approach to the introduction of Thinking Skills was discussed. If many teachers on the staff are briefed on the Thinking Skills content and methodology and adopt a problem-solving approach, then there would be more chance of transfer : the pupils would be challenged in varied contexts across the curriculum.

The Workshop ended with each group presenting a skit, motto or poster reflecting what TASC meant to them. These were both amusing and insightful, demonstrating that the aims and ideals of TASC had in essence, been grasped.

Certificates acknowledging participation and co-operation in the project were presented. Each teacher received a draft copy of the Starter Kit (TASC materials for trialling).

4.8.3 Visit to School D: 16 September 1994

This was to have been a staff workshop involving the teachers in group Thinking Skills activities but the time allocated was reduced at the last minute to 45 minutes. The researcher, therefore, used the time to describe the TASC project in terms of the 'networking' opportunity it had provided over the course of the year. The teachers who had attended the Workshops were invited to share their perceptions of the project with the staff.

The following aspects were significant:

- It had been enriching working with teachers in other education Departments
- They had found that having the Thinking Skills identified for them was useful; making them explicit had given new direction to their teaching
- The practical exercises they were exposed to were of more value than the theory.

4.8.4 Responses to opinionnaire

To conclude Phase Four and to 'take leave' finally, of the project, a letter inviting a personal response from participants was sent out (Appendix 12). Some teachers responded by phone and others returned the opinionnaires. These are included in Appendix 13.

Common themes emerging from the responses were considered in terms of changes for the teacher, changes for the pupils and changes for the curriculum.

Teachers felt that they:

- had learnt 'new methods' which were enriching
- knew how to shift the emphasis from content to skills
- could improve their teaching and were personally motivated
- were sharing new ideas with colleagues
- enjoyed networking
- could make content more relevant for the pupils

All commented on increased **pupil participation**: ('enthusiastic', 'active', 'hive of activity', 'learn by doing', 'gained in self confidence' etc). Although direct reference was not made to the curriculum, the fact that teachers felt they could give a cognitive/skills-based emphasis to the content and make content more relevant are significant pointers to the way teachers feel they can interpret, or influence, the curriculum.

4.8.5 Summary of PHASE FOUR

During this Phase the researcher was able to assess how the teachers had developed professionally and in terms of personal growth. Particular interest was taken in how they expressed themselves in report-backs at the Workshop and in their 'response forms'.

Definite **changes** were noted:

- participants who appeared 'disempowered' by the dominance of seemingly more capable peers and who were very reticent (see 4.2.4 - First Workshop) were forthcoming and contributed during the problem-solving exercises and the skit / poster report-back

- the sharing was more genuine during the activities
- relationships had been formed beyond the confines of the Workshops (e.g. 'new friends of different skin' - and 'our pupils met one another' [at sports that had been arranged] 'improving our kids' way of communication'
- for some 'there was no turning back' in terms of methodology : group interaction was a valuable way of improving self-confidence and language ability in pupils - 'new insights' were gained 'in the entire teaching process'

4.8.6 Conclusion

The findings from the concurrent analysis of data collected during the project as described in Chapter Four will be summarised in the concluding chapter of this dissertation. The implications for curriculum development in the local context will be considered and recommendations made. The limitations of the research study will also be discussed.

The analyses of various aspects of the project are shown graphically below and conclude this chapter. They consist of the action-research spirals shown visually from the researcher's point of view (figure 7) and from the points of view of the participants (figure 8). Figures 9 & 10 show the overall research design for the four phases of the TASC project and can be superimposed on one another as transparencies. These are also in the form of cycles of spirals. The four phases of the project are alternatively analyzed in block form to show how they coincide with the Action Research Stages (figure 11). These graphic organisers serve as a visual summary of the data described in Chapter Four.

(a)

**ACTION RESEARCH SPIRAL:
TASC WORKSHOPS AND SCHOOL VISITS**
An interactive-participatory model for SBCD
From Researcher/Facilitator's point of view

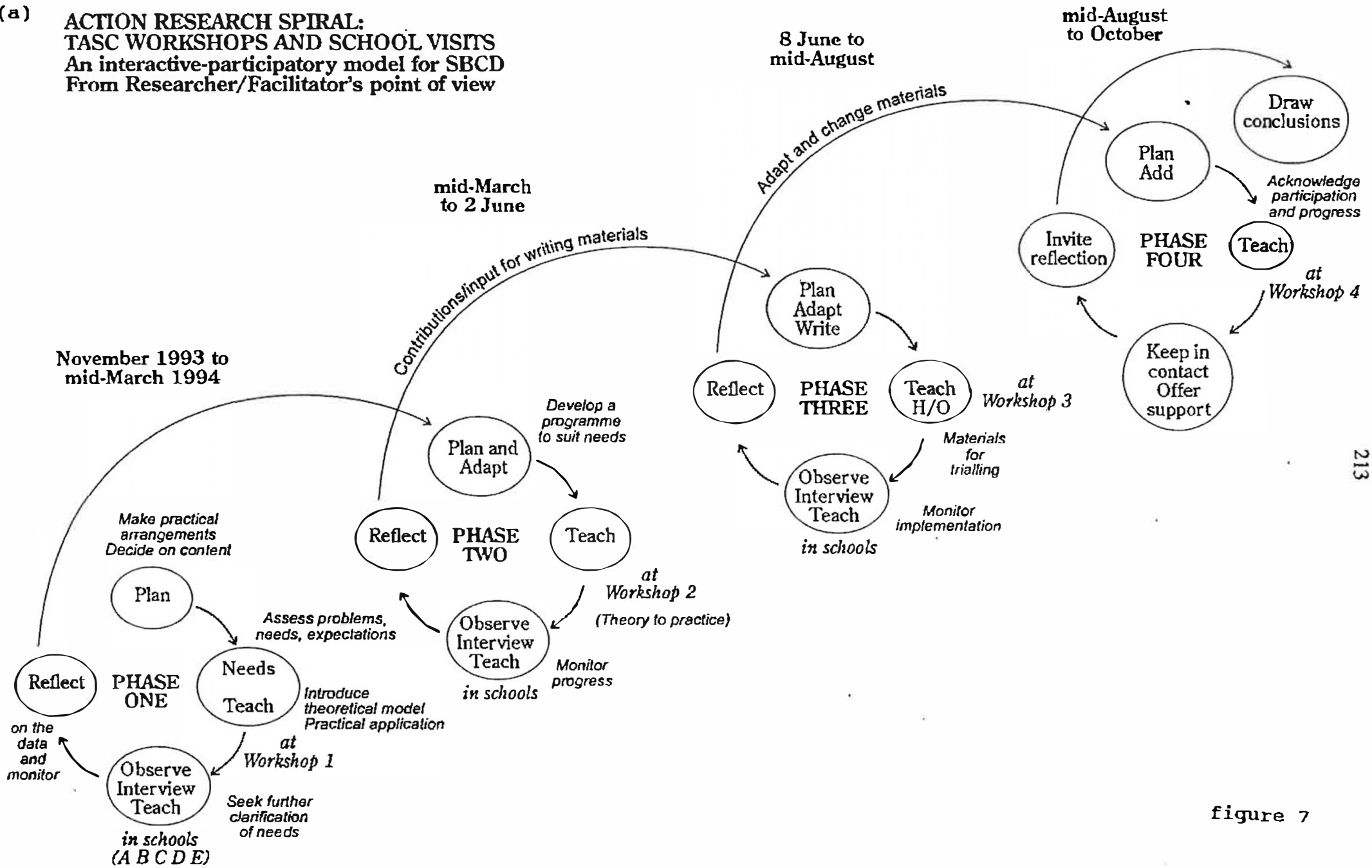


figure 7

(b) **ACTION RESEARCH SPIRAL:**
TASC WORKSHOPS AND SCHOOL VISITS
 From point of view of participants

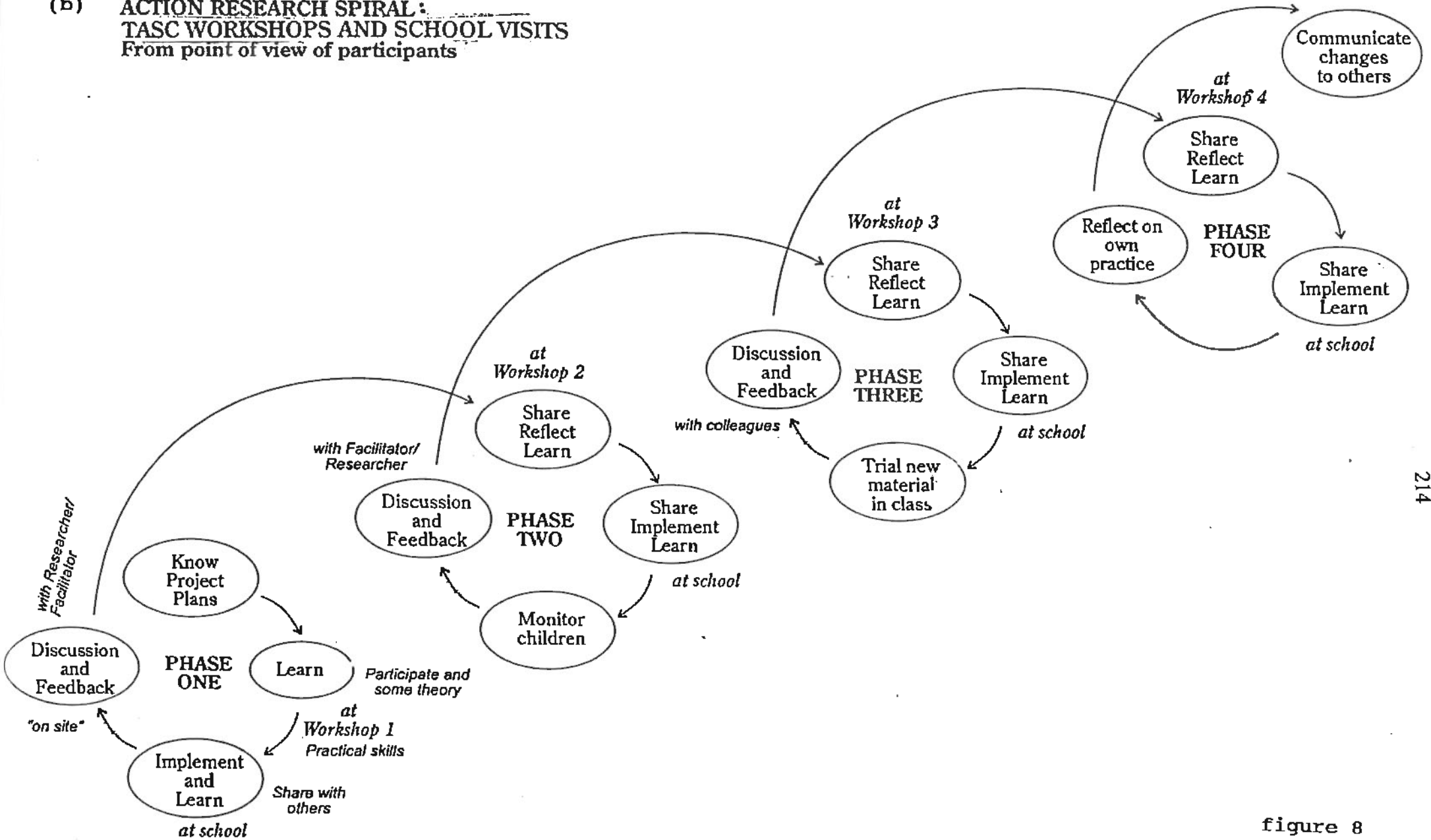


figure 8

RESEARCH DESIGN FOR THE FOUR PHASES OF THE TASC PROJECT

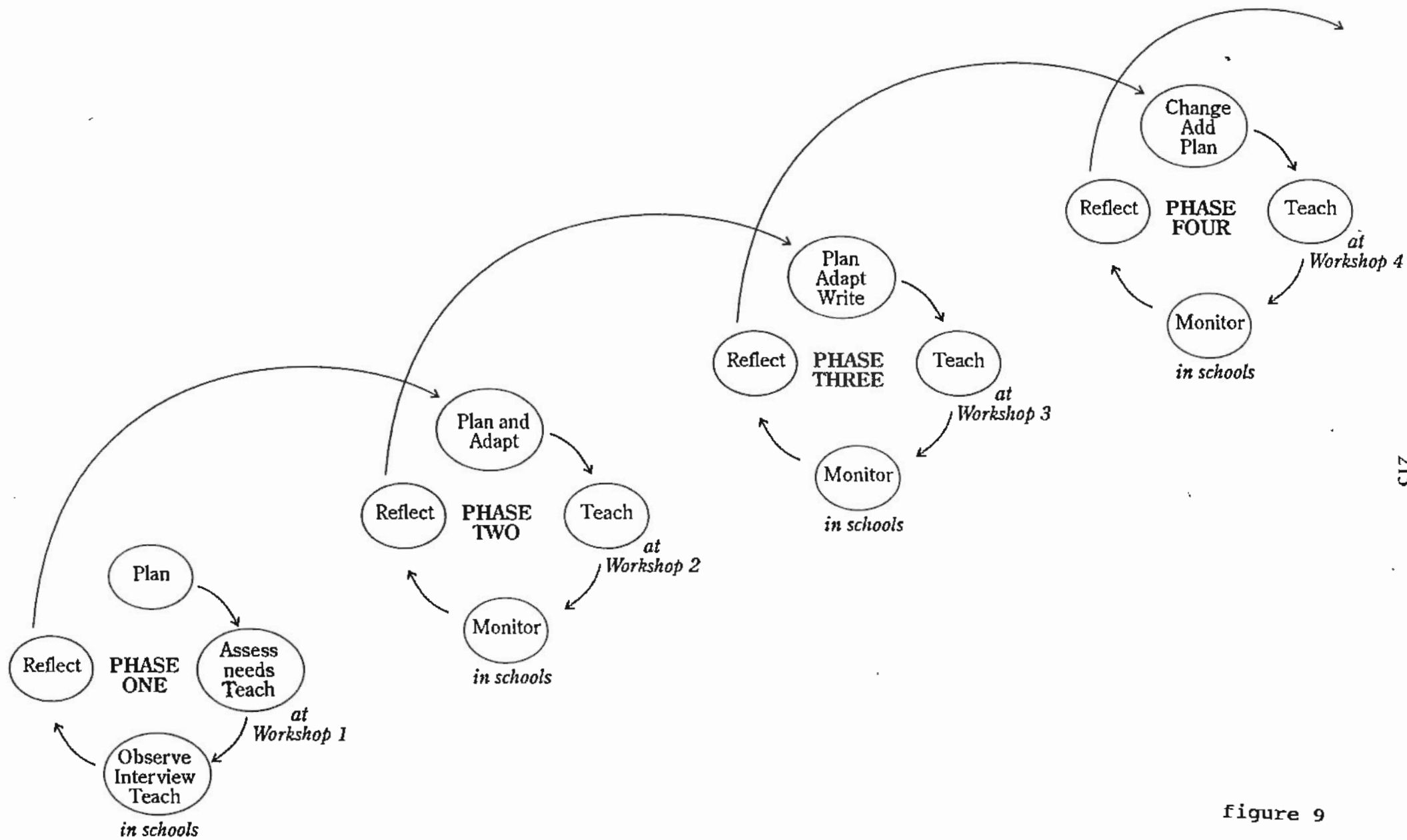


figure 9

THE FOUR PHASES OF THE TASC PROJECT SHOWN AS CYCLES OF SPIRALS:
 DIAGRAM SHOWS TWO SPIRALS FORMING ONE ACTION RESEARCH CYCLE

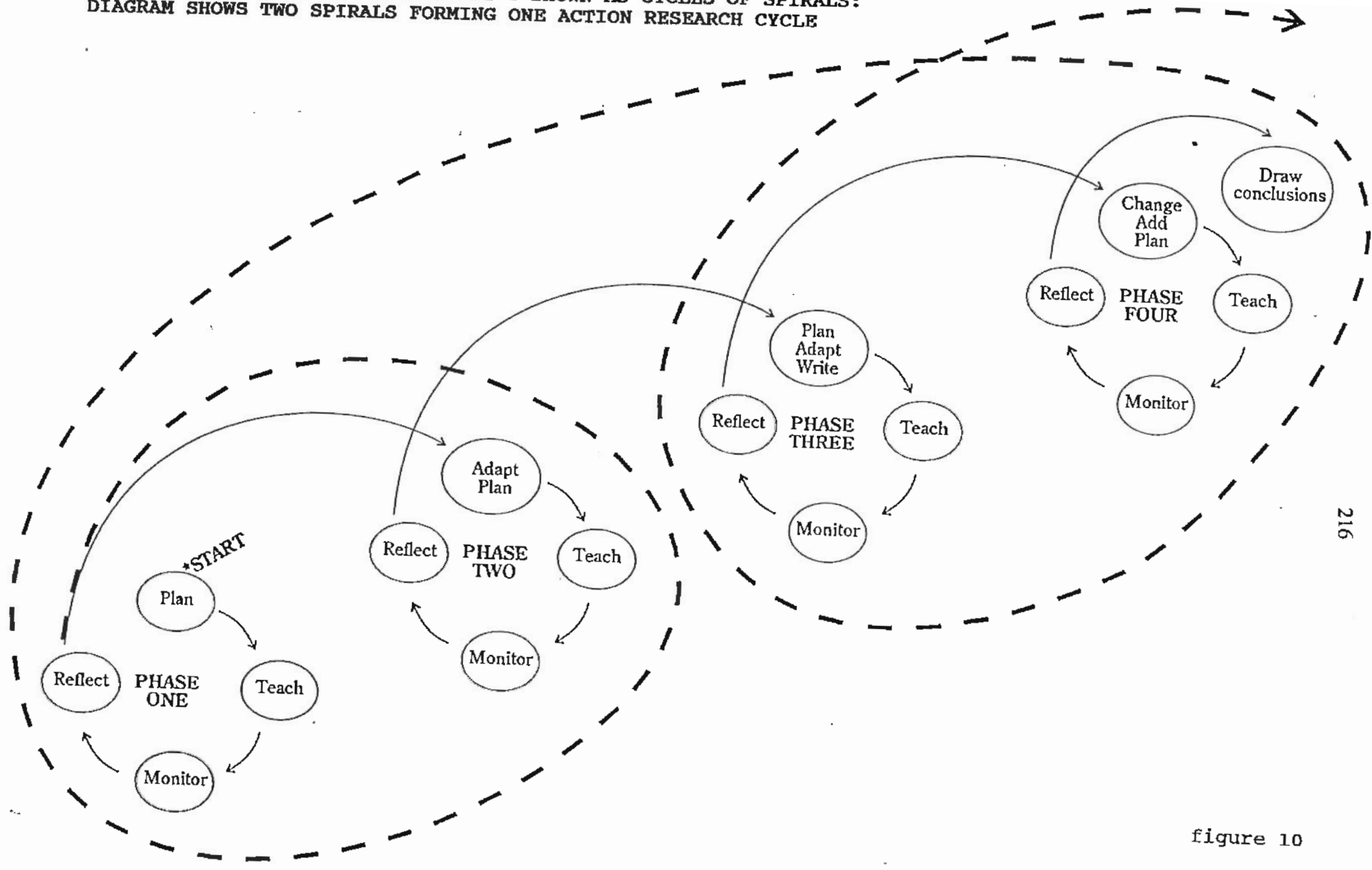


figure 10

**ANALYSIS OF THE FOUR PHASES OF THE TASC PROJECT
IN TERMS OF THE ACTION RESEARCH STAGES**

PHASE 1	PHASE 2	PHASE 3	PHASE 4
WHERE ARE WE GOING?	HOW IS IT GOING?	HOW CAN WE IMPROVE?	HOW HAVE WE DEVELOPED?
<p align="center">Situational Analysis and plans for the project</p> <p>Overall summary of emerging themes and Comparison Grid of "problems", "help required" and "expectations "</p> <p><i>First Action Research Step</i></p> <ul style="list-style-type: none"> * Formulating the general idea * Fact-finding exercise – understanding the contexts * Planning how we are going to work – establishing time-order frames * Negotiating access <p><i>Second Action Research Step</i></p> <ul style="list-style-type: none"> * Introducing the Thinking Skills * Meet other members of staff at the schools 	<p>Overall summary of impressions: Observations/Interviews and <i>Implementation</i> of thinking skills</p> <p><i>Third Action Research Step</i></p> <ul style="list-style-type: none"> * Gathering information from group discussion and observation * Actively understanding what is happening * Monitoring progress <p><i>Fourth Action Research Step</i></p> <ul style="list-style-type: none"> * Reflecting and critically evaluating * Adapting and planning for third workshop in order to improve <p align="center">Completion of First Action Research Cycle</p>	<p>Overall summary of <i>Implementation</i> Observation and Interviews</p> <p><i>First Action Research Step</i></p> <ul style="list-style-type: none"> * Look at the new situation * Give more input on the new idea (Thinking Skills) * Back practice with theory <p><i>Second Action Research Step</i></p> <ul style="list-style-type: none"> * Introduce problem-solving * Build programmes * Keep up momentum <p align="center">Assessing responses – Change –</p>	<p>Overall summary of professional development, growth and change</p> <p><i>Third Action Research Step</i></p> <ul style="list-style-type: none"> * Gather information on progress * Actively understanding what has changed <p><i>Fourth Action Research Step</i></p> <ul style="list-style-type: none"> * Reflecting on the process (Researcher) * Reflecting on our practice (Teachers) <p align="center">Making recommendations for future planning</p>

figure 11

CHAPTER 5

SUMMARY OF RESEARCH PROCEEDINGS : FINDINGS, LIMITATIONS
AND RECOMMENDATIONS5.1 Introduction

In concluding this research-report the findings will be summarised in terms of the aims of TASC (Thinking Actively in a Social Context) as a means of promoting school based curriculum development. The process of the TASC project is recapitulated and relevant aspects highlighted. Conclusions were drawn at the end of each phase of the project described in Chapter Four, based on a mode of analysis and reflection done concurrently with data collection while in the field (Bogden and Biklen, 1992: p153). This chapter summarises these conclusions.

The limitations and weaknesses of the research design and methods will be discussed in so far as these pertain to the TASC project as a school based curriculum initiative.

Recommendations for the introduction of Thinking Skills programmes in primary schools as a means of effecting change on a wider scale will be made, based on the findings of the study. These recommendations take into account some of the problems identified by teachers using a skills-based approach (Mathfield, 1992), and will consider the extent to which the adoption of the TASC framework addresses these problems. Tentative suggestions for the training of teachers in Thinking Skills using the TASC model are made in response to the problems in education outlined in Chapter Two. They are based on the

findings of this study which point to the viability of TASC as a vehicle for change at the school based level. The findings are evaluated against criteria for wide-scale change as suggested by Perkins (1992), and the pros of SBCD (Chapter Three). The justification for teaching Thinking Skills in the curriculum (literature review : Chapter Two) and the extent to which TASC fulfils many of the aims of the 'teaching for thinking' movement were taken into account when making the recommendations.

5.2 Summary of the process

The training of teachers in Thinking Skills across the primary curriculum was undertaken over a period of nine months as a networking exercise between the five former Education Departments in KwaZulu-Natal. It was an intervention which aimed at developing teachers' professional knowledge by introducing them to the teaching of cognitive skills in the curriculum. Through the identification at Workshops of certain Basic Thinking Skills and Tools for Effective Thinking and the presentation of a problem-solving approach as outlined in the TASC model, teachers were made aware of the theoretical underpinnings of the skills-based/Thinking Skills approach. The experiential activities, collaborative learning, planning and application of the skills at the Workshops, followed by practical implementation in the classroom using TASC methodology, gave teachers the opportunity to put theory into practice : they could try out new lessons, monitor their pupils' responses and reflect on the process.

The study focused on the teachers' perceptions of the intervention as elicited through interviews, group discussions at Workshops and opinionnaires. The reflection of the

participants and the observations of the researcher revealed changes in practice that could have significant implications for teaching and learning. It was evidence of this that was sought during the data-collecting and analysis phases. The action-research design allowed data to be collected over a long period, while enabling subjects to assimilate and understand new concepts, implement new ideas and to reflect on the process in an on-going way. A series of Workshops and 'on site' interactions with the researcher and school colleagues were the chosen 'activity settings' (Gallimore and Tharp, 1991). The researcher took care to base the Workshop format on the ten TASC teaching principles, modelling for the participants as learners the kinds of experiences they could provide for their pupils. (Wallace & Adams, 1993).

It was important at the beginning of the project to let teachers articulate their problems and to talk about factors frustrating their goals (Skilbeck and Taba in Marsh, 1988). The Workshops provided a means of working in a participatory, collaborative way, and the school visits provided the researcher with the opportunity to understand the context of her subjects. Teachers could improve their knowledge by working within an action research framework with the researcher as facilitator (Walker, in Davidoff et al (eds) 1993; Robinson in da Costa et al (eds) 1994). The process was interactive and allowed for both researcher and teachers to reflect critically on progress at each stage (Chapter Four).

5.3 Limitations and weaknesses of the project

It is particularly important to acknowledge the limitations of the research study and of the curriculum innovation itself.

5.3.1 Subjectivity and bias

In choosing an action research design and qualitative research methods, the problem of bias on the part of the researcher was taken seriously. The researcher took care to build and nurture relationships of trust and caring with her subjects. She was not only participant observer in classrooms but also presenter of the curriculum innovation and responsible for the training of the teachers. It was particularly important to establish the transparency of her role. She was teaching, observing, interviewing and reflecting with her subjects in order to ensure transfer of training which in itself would make 'objectivity' and 'neutrality' difficult. It was for these reasons that a positivist approach was rejected. The participants in the project were both colleagues in a participatory education venture and 'subjects' who were also the 'objects' of the study. The problems of subjectivity and possible bias were dealt with when discussing research design and methods in Chapter 3 (3.3.6). Measures taken to guard against these problems were as follows:

- The workshops were observed and reported on by senior subject advisers from the Natal Education College and/or members of the Network Committee (See Appendix 11 - G. Prinsloo). Thus proceedings were open to the scrutiny of a wide audience as the progress reports were published in educational newsletters and magazines. This was a form of triangulation described in paragraph 3.3.10.
- The participants were informed of their trainer's research role.
- Interviews, except at school A, were all tape recorded and transcribed. Recordings were listened to and the transcripts matched for accuracy by a University colleague. *100%*
- Data collected in the information gathering stage (Phase One) from classroom observations were corroborated by a multi-racial team of writers at the University's

Curriculum Development Unit who also had the opportunity to be observers for their own research purposes in the same schools. These data confirmed 'the problem situation' which prompted the research (Chapter Two).

Although the investigation was subjective in that the researcher was interested in the values, interests, perceptions and problems of teachers on her training course, it is possible to claim objectivity as many of the people involved in the action research agreed on many of the findings on the issues investigated .

5.3.2 Choice of subjects

This was a limitation in that teachers were invited to join the project only if they were senior primary teachers with an interest in environmental studies. Thus other subject teachers with possible leadership potential and an interest in Thinking Skills were not included. This might have limited the success of the project as school-based curriculum development often relies on the motivational qualities of the participants. On the other hand the fact that the subjects were not chosen by the researcher herself would help to counter claims of bias.

5.3.3 Metacognition and transfer hampered by language difficulties.

It could be argued that not enough attention was paid to the metacognitive and transfer aspects of the model as general educational ideals. The findings revealed that teaching these aspects of Thinking Skills was problematic where communicative language competence was

limited. This came out strongly in the interviews. Research by Mathfield (1992) identified metacognition and transfer as **generally problematic** regardless of language factors which compounded the difficulties in this study where the majority of participants and pupils were operating in their second language.

5.3.4 Inconsistent approach

It was inevitable that there would be inconsistencies of approach in a study of this nature. It was not easy to gain access to schools at times that would have been most beneficial to participants. There was less intervention in certain cases than others necessitating different strategies. The varying competencies of participants and school contexts also meant adapting the intervention accordingly e.g. in school D, Thinking Skills lessons which modelled desired teaching behaviours (eg. attention to metacognition and transfer) were arranged which did not occur in other sites. While a few teachers at this school may have benefited from the modelled lessons or 'peer coaching' offered, the staff as a whole did not have the input on a whole-school basis of a staff workshop early in the year. Differences in amounts of contacts and types of interactions with each of the five schools (see time-order frame at beginning of Chapter Four), therefore, could be considered a weakness - albeit one that is characteristic of the chosen design.

5.3.5 Participants not involved in the choice of intervention

Much has been written about emancipatory action research (Carr and Kemmis, 1986; McKernan, 1991; Davidoff et al (eds) 1993; da Costa et al (eds) 1994). The participants

in this action - research study did not themselves choose a Thinking Skills intervention as the means by which they would be reflecting on and trying to improve practice. They themselves were not involved in the planning of the workshops or the staff interactions. While the participants may have found the process empowering in that more 'rational, just and democratic forms of education' (McKernan, 1991) were sought, they did not have a direct say in the planning, which may be considered a limitation.

5.3.6 Co-operative planning - failure to transfer to school situation

Though participants were involved in collaborative group planning sessions (Workshop 1, session 3: paragraph 4.2.3 of Chapter 4) this was an aspect of the intervention that many of the participants were unable to implement with their colleagues. One of the aims for the teacher in the TASC framework is that teachers share their aims and goals with each other and with their pupils. There was little evidence that this was achieved by the majority of participants and only happened in the case of School B.

5.3.7 Action-research and the skills of the enquirer

McNiff (1988) suggests that much of the success of action research depends on the skills of the enquirer. Because action research is participatory and collaborative it requires a high degree of interpersonal skill and also the ability to ask the right questions. As a novice researcher, inexperience in this field would be considered a limitation.

5.3.8 Failure to address the problem of lack of parental involvement

A lack of parental involvement was a problem common to all of the five schools as documented by teachers at Workshop 1 (Chapter Four). This was closely linked to their perceptions of the children as 'ignorant', 'lacking in home stimulation', and 'poverty of the children's backgrounds' where parents were unable to give any support to the educational efforts of the teachers. These difficulties had a demoralising effect on the teachers. The fact that these problems, so closely related to teaching and learning, were not addressed at all was a limitation. Aspects of these problems could have been used in one of the problem-solving sessions to demonstrate how thinking techniques and strategies can be employed to deal with relevant, real-life difficulties in the school context within the TASC framework. This point will be taken up under recommendations (5.6 below).

5.4 Summary of Findings in terms of TASC's aims for the teachers, the learners and the curriculum (4.1.1).

5.4.1 Teachers and pupils as learners

In this summary the learners are both the participants in the project and their pupils. Significant changes were recorded on both levels in terms of more active involvement, participation and increased self-confidence.

5.4.1.1 Self concept and increased participation

Pupils' responses to the Thinking Lessons and TASC methodology as related by the teachers were positive in terms of improved self concept and self confidence. Group work gave more opportunity for participation on the part of pupils in that there were more opportunities to speak. It was reported that many children who were shy or lacking in confidence would feel safe within the group and were thus more willing to speak out loud. There was more enjoyment and enthusiasm as children realised that learning could be collaborative.

The same applied within the workshop groups amongst the teachers. Similar responses to those recorded by the teachers of their pupils were recorded by the researcher in her observations of the teachers in the Workshops. Those who felt threatened at first gradually gained confidence and contributed in discussions quite confidently by the end of the course (see 4.8.5 below).

5.4.1.2 Learning how to learn

Whether the pupils were better able to make decisions and solve problems drawing on a repertoire of basic Thinking Skills and Tools by the end of the project, was outside the scope of this study. Two of the teachers interviewed commented that they themselves had benefitted as learners (in their own studies and in their personal lives) from having the skills identified and by practising their use in the Workshops.

5.4.2 The teachers

5.4.2.1 Change of role

A strong theme emerging from the data collected was the understanding on the part of the participants that their roles as teachers could shift from that of 'knowledge-giver' to facilitator to guide or 'manager' in the classroom (interview with Teacher 1 - School B) Many commented on 'better questioning techniques' and a move to encourage more 'questions from the pupils'.

All but three of the seventeen teachers observed giving Thinking Skills lessons were able to model 'thinking' behaviour and emphasise a particular skill or **thinking tool** within a 'normal' content lesson.

Teachers from Schools B and D (significantly those who were better trained, where the language of instruction was their first language and the first language of their pupils, and who had more material resources in the classroom due to the historically unequal provision of the State) were those who felt more capable of introducing curriculum changes and had gone ahead with introducing these.

On the negative side, very few teachers engaged in co-operative planning (see limitation - 5.3.6 above). Many also felt that rigid time-tabling and test/exam constraints would impede the continued emphasis on Thinking Skills if these were not directly related to content.

5.4.3 The curriculum

Many of the group discussions and interviews revealed an attempt on the part of teachers to adapt their subject content to make it more relevant to the learners (see examples of 'bridged' lessons reported in 4.4.1). Thus the research findings show that the problem of curriculum relevance (highlighted as common to most teachers on the Comparison Grid - Appendix 2) can be dealt with by individual teachers who have undergone the kind of critical reflection demonstrated in this study.

It was also found that the shift from an authoritarian to more democratic teaching mode in the classroom is possible where teachers have been exposed to recent theories of teaching and learning that reflect a more progressive, person-centred approach as contrasted with the traditional school (Davidoff and Van den Berg, 1990 and 4.1.1 above). All teachers in Schools B and C (and all but a few in the other schools) demonstrated empathy with their pupils and encouraged a more democratic and participatory atmosphere in their classes. The positive changes revealed by teachers' responses in this study indicate exciting possibilities for change towards a more enabling curriculum in our schools.

5.5 The research findings in terms of criteria for more wide-scale change

Perkins (1992) in Chapter 9 of *Smart Schools : from Training Memories to Educating Minds* suggests that small scale changes and innovations are relatively easy where teachers are highly motivated, autonomous in their action and have a supportive climate in which

to operate. It is argued, however, that in order for wide-scale change to take place a number of criteria deemed necessary to facilitate change should be kept in mind.

The first is that the workload of teachers should not be unduly escalated by a curriculum innovation. The participants in the TASC project did mention time and the increased preparation necessary for Thinking Skills lessons as 'difficulties' especially where there were no photocopying facilities. This would militate against the success of the innovation.

The second criterion is that teachers should be allowed a creative role in any new initiative. This was indicated in the literature survey of Chapter Two (Raubenheimer, 1992/93) where top-down models of curriculum development, such as that of the Natal Primary Science Project, are shown to be less effective than those in which teachers have participated creatively and where they consequently have experienced a sense of 'ownership' over a new programme. In the case of TASC, co-operative planning of lessons was encouraged, where teachers worked together in subject groups to discuss aspects of the syllabus that lent themselves to treatment using a Thinking Skills or problem-solving approach (4.2.3 above). Many of the ideas generated collaboratively in the Workshops were subsequently put into practice in the classroom (researchers' field notes and recordings in 4.7.3 for example). Lessons similar to those practised in group activities were written up in the form of a 'Starter Kit' of materials for trialling in schools. Participants tried the lessons and gave feedback on successes and difficulties. The style of the TASC materials, therefore, was familiar to the teachers when printed, and because teachers played a creative role in their development, were very positive in their response (Phase Four 'Reflections' - see Appendix 13). These materials were thus strongly supportive of participants in the curriculum innovation - a third criterion for facilitating acceptable change.

A fourth criterion for wide-scale change according to Perkins (1992) is that extreme demands on teachers' skills and talents should be avoided.

One of the main drawbacks of the implementation of the Thinking Skills in the TASC project was the fact that the majority of learners were disempowered by the fact that the medium of instruction after Std 3 is not that of the mother-tongue. Curriculum innovations should therefore pay attention to the levels of language competence of the teachers and children. There is strong advocacy for programmes that combine the teaching of Thinking Skills and a second language especially in South Africa (Puhl, 1991; Botha and Cilliers, 1992). A Thinking-L2 combination approach would address the problems of both the teachers, who all expressed the need for 'better communication', 'help with language, ' etc (see 4.2.1.1. above) and of the children who 'fail to understand' (teacher-interview School E). 'The Keys to Thinking' programme (Chapter Two) arose out of this theoretical rationale and is an example of a programme that can benefit teaching skills, address national needs and be implemented without placing extreme demands on teachers' skills and talents (Puhl, 1991) where these are hampered by the constraints of teaching and learning in a second language.

Other suggested criteria for curriculum innovations to be able to effect change towards better schools and more enabling learning environments (Perkins, 1992) are as follows:

- the innovation would require a degree of challenge
- there would have to be a clear need within each participating school (4.2.1.1)
- it would need to have the support of the principal and motivated teachers to lead it (see also Campbell, 1985; Brady, 1987)

- it must be feasible, with available talents and resources (both internal and external)
- it would require on-going support and advice
- internal expertise should be developed ie. teachers should have the scope to devise and develop their own unique programmes to suit their own schools
- it would be important that teachers understand and develop new processes through action and reflection - i.e. not to simply comply with the technical requirements of the innovation
- teams of teachers should be formed to plan co-operatively and solve problems as they arise.

The TASC framework and the method of implementing it as described in this study has the potential to fulfil many of the above criteria. It would be an alternative form of teacher development and INSET to that offered in the past. On-going action research projects within the Thinking Skills paradigm could involve teachers in 'the democratisation of their own education situations' with the hope 'that such efforts might promote changes in society in general' (van den Berg and Meerkotter, 1994).

5.6 Recommendations

Often individuals feel concerned when theoretical, articulated or tacit educational goals do not appear to be achieved in practice.

For any administrators, school principals, department heads, or groups of teachers who feel the need to improve existing curriculum structures or teaching and learning situations, the

TASC framework applied along the lines described in this study provides a feasible approach for staff development, professional growth and curriculum innovation. Not only does it have a justifiable theoretical base, but it is flexible, provides training in Thinking Skills and problem-solving, and has clearly democratic aims and educational goals (Wallace and Adams, 1993).

TASC used in conjunction with an action research approach, can effect changes in the individual perceptions of educationists related to their profession, renew enthusiasm and lead to more autonomous thinking, action and decision-making. The use of Workshops at centralised venues for bringing teachers together from different schools and then following these up with 'in house' workshops at individual schools was found to be manageable and feasible, given strong commitment and co-ordinating ability on the part of the initiators. Thus the strengths of action research (Davidoff and Van der Berg, 1990) as a participatory, collaborative, democratic process in which teachers are involved at a grassroots level - can be combined within a Thinking Skills framework which could contribute towards meaningful curriculum change and better teaching and learning in the new educational dispensation of a democratic South Africa.

In order for this theoretical rationale to be practical and of direct benefit to teachers the following recommendations are offered for consideration:

- Schools could form links with outside experts, researchers or curriculum-developers to facilitate change. Such people should have a strong background in the theory underpinning the information-processing or cognitive skills movement and be able to facilitate or co-ordinate on-going programmes. Teachers themselves, however,

should be involved in the initiation and planning of projects, without this impinging unduly on their time.

If SBCD were to graft itself onto the life of the school in a permanent and authentic way the forms of its encouragement have to embody real respect for specialist expertise and an acknowledgement of teachers' potential for shaping and adapting programmes by reference to their professional judgement. (Campbell, 1985: p109).

- Teams of concerned and committed teachers could be identified to play a leadership role within their schools, working closely with their principals to motivate for the desired change:

Somehow the staff and principal have to work together to build a congenial, productive, working climate for their school. (Marsh, 1988: p110).

With an action research approach, guidance from an outside researcher or facilitator and training in the TASC paradigm, these 'leaders' could become 'trainers of trainers' (Joyce and Showers, 1981). This approach, with a strong net-working thrust, could form a self-generating movement towards change in schools, which would rely on the autonomous action of motivated teachers. An important responsibility of the principal would be to create the time for teachers to discuss educational issues and to develop professional expertise. They may also need to be flexible in addressing the thorny issue of allocating time-table time to the new curriculum innovation.

- TASC Workshops for administrators, teacher trainers and principals could be offered on an ongoing basis. These could be viewed as 'activity settings' that could provide and aim for each level in the hierarchical structure of education to be assisted constructively in their 'zones of proximal development' (Gallimore and Tharp, 1991; Adams, 1994 in press).

- TASC Workshops for parents in school communities could be initiated. In this way parents could be provided with a forum through which they could articulate their educational goals for their children. They could thus work collaboratively with teachers in promoting and improving their own and their children's Thinking Skills or problem-solving behaviour. Such Workshops, sensitively handled and based on the TASC teaching principles (see Appendix 8) and on the premise that all thinking can be improved and that education is a life-long process, could be personally empowering for parents, regardless of educational background.

Where the majority of parents in this country have been denied access to education and have been denied participation in educational decision-making (Nepi Curriculum Report, 1992), such initiatives could provide valuable structures for democratic interaction between schools and communities. This in turn would help teachers in dealing with children from disadvantaged backgrounds and whose cognitive development may have been affected by lack of parental involvement and mediated learning experiences (Feuerstein, 1980).

5.7 Addressing the problems of metacognition and durability of Thinking Skills programmes

The three most significant problems associated with the introduction of Thinking Skills programmes according to research in this field, are those of transfer, metacognition and durability (Mathfield, 1992).

5.7.1 Metacognition

The TASC model places great emphasis on metacognition and the modelling of reflective thinking by the teacher. Teachers trained within this framework, therefore, are encouraged to 'think about thinking' and to discuss the processes involved in problem-solving activities. By becoming metacognitively aware themselves, they learn to model these attitudes for their pupils. Teachers using the TASC framework would be trained to emphasise this aspect in the classroom and regard it as important as the introduction and explicit teaching of the Thinking Skills and Tools.

5.7.2 Transfer

The importance of this issue was discussed in paragraph 2.3.2.5 of the literature survey (Chapter Two). Effecting transfer via 'low road and high road' mechanisms are proposed by Salomon and Perkins (1989). Teachers involved in teaching Thinking Skills need to be

aware of both the difficulties of achieving transfer and the utmost importance of striving for it. Wallace and Adams emphasise that:

Development of **thinking** must be transferred through constant practice into the context of the learner. (1992: p18).

The responses of teachers in this study indicate that training in TASC theory and methodology enables teachers to adapt and change their normal teaching by giving a **thinking skills** slant to a variety of subjects across the curriculum.

5.7.3 Durability

If both metacognition and transfer are consciously integrated with the process of teaching **Thinking Skills** the durability of the skills and processes should logically follow. As one of the most important aims of teaching **thinking** is to train people to be independent, active and autonomous problem-solvers, it is essential that these two aspects are emphasised in order to achieve lasting competencies in the learners. This will only happen if the programmes are adapted to different contexts and made relevant to the lived experiences of the children. Teachers trained in this project demonstrated their ability to do this, with positive responses from their pupils. Further follow-up and research would be necessary, however, to establish the durability of such an initiative.

5.8 Conclusion

This chapter has attempted to synthesise the implications of introducing teachers to a **Thinking Skills** approach across the primary curriculum. The aims of the TASC project and

the process of the research study and its findings were summarised. Limitations and weaknesses were discussed and recommendations for future educational initiatives were made. By bringing teachers together in the co-operative learning environment of the TASC Workshops described in this study, it was possible to investigate how participants responded to a curriculum innovation of this nature. An action research process was recommended to promote personal and professional growth in individuals within a supportive, positive organisational climate. The extent to which the project influenced teachers in their classroom practice has been described and analyzed. The implications of the findings were reported and recommendations made with a view to wide-scale change promoting better teaching and learning in schools through a viable school based curriculum development initiative such as the TASC project.

In conclusion, this researcher agrees with Britt-Mari Barth, cited in Maclure & Davies (1991), that while research in cognitive science continues across disciplines probing the eternal philosophical question of how the mind works, educationists, meanwhile, must:

use the knowledge we possess in order to create the optimum conditions under which teachers and learners can best fulfil their tasks. (p126).

New knowledge about thinking, teaching and learning applied now will help children cope with the demands of a rapidly changing world.

REFERENCES

- ADAMS, H.B. (1986). Teaching General Problem-Solving Strategies in the Classroom. *Gifted Education International*. Vol 4(2) p84-89.
- ADAMS, H.B. and WALLACE, B. (1990). *TASC*. University of Natal, Pietermaritzburg.
- ADAMS, H.B. (1994). *Teaching as Assisting Performance in the Zone of Proximal Development : Implications for Teacher Education*. In press. University of Natal, Pietermaritzburg.
- ADAMS, M.J. (1989). Thinking-Skills Curricular : Their Promise and Progress. *Educational Psychologist*. Vol 24(1) p25-77.
- ADEY, P. (1991). *Cognitive Acceleration through Science Education*. In Maclure S & Davies P (eds). *Learning to Think, Thinking to Learn*. Oxford: Pergamon.
- ADEY, P.S., SHAYER, M. and YATES, C. (1989). *Thinking Science : The Curriculum materials of the CASE project*. London : MacMillan. Education.
- ALENCAR, E.M.L.S. (1993). Thinking in the Future : the need to Promote Creativity in the Educational Context. *Gifted Education International* (1993). Vol 9 p93-96. AB Academic Publishers.
- ASHMAN, A. and CONWAY, R. (1993). *Using Cognitive Methods in the Classroom*. London and New York : Routledge.
- AUSUBEL, D. (1985). Learning as Construction of Meaning. In Entwistle N. *New Directions in Educational Psychology : 1. Learning and Teaching*. London : Falmer.
- BANDURA, A. (1977). *Social Learning Theory*. New Jersey : Prentice Hall.

- BARNES, D. and TODD, F. (1977). *Communication and Learning in Small Groups*. London : Routledge and Kegan Paul.
- BARON, J.B. and STERNBERG, R.J. (1987). *Teaching Thinking Skills : Theory and Practice*. New York : Freeman.
- BARTH, B. 1991. From Practice to Theory : Improving the Thinking Process : In Maclure, S. and Davis, P. *Learning to Think : Thinking to Learn*. Oxford : Pergamon Press.
- BELL-GREDLER, M.E. (1986). *Learning and Instruction : Theory into Practice*. New York : MacMillan.
- BLAGG, N. BALLINGER, M. and GARDNER, R. (1988). *Somerset Thinking Skills Programme*. Oxford : Basil Blackwell.
- BLAGG, N. (1991). *Can We Teach Intelligence?* Hillside, NJ: Lawrence Erlbaum Associates.
- BOGDAN, R.C. and BIKLEN, S.K. (1992). *Qualitative Research for Education : An Introduction to Theory and Methods*. Allyn and Bacon.
- BONDY, E. (1977). Thinking about Thinking. *Journal for Technical & Vocational Education in South Africa*. Vol 113 p7-10.
- BORKOWSKI, J.E. (1985). Signs of Intelligence : Strategy Generalisation and Metacognition. In Yussen, R.S.(ed). *The Growth of Reflective Thought in Children*. New York : Academic Press.
- BOTHA, H.L. and CILLIERS, C.D. (1993). Programme for Educationally Disadvantaged Pupils in S.A. : a multi-disciplinary approach. *South African Journal of Education*. Vol 13(2).

BRADY, L. (1987). Explaining School-based Curriculum Satisfaction : a Case-Study. *Journal of Curriculum Studies*. Vol 19(4) p375-378.

BRANSFORD, J.D. and STEIN, B.S. (1984). *The IDEAL Problem Solver*. New York: Freeman.

BRUNER, J. (1985) Vygotsky : A Historical and Conceptual Perspective. In Wertsch J V. *Culture, Communication and Cognition : Vygotskian Perspectives*. New York: Cambridge University Press.

✓ BRYMAN, A. (1988). *Quantity and Quality in Social Research*. London: Unwin Hyman.

BURGESS, R.G. (1984). *Field Methods in the Study of Education*. London: Falmer.

BUSCAGLIA, J. (1987). The Development of Thinking Skills within the Cultural Identify of Latin America. In Perkins, D., Lochhead, J.,

CAMPBELL, R.J. (1985). *Developing the Primary School Curriculum*. London: Holt, Rinehart & Winston.

CARR, W. and KEMMIS, S. (1986). *Becoming Critical : Education, Knowledge and Action Research*. London: The Falmer Press.

CHRISTIE, P. (1990). Reforming the Racial Curriculum : Curriculum Change in Desegragated Schools in South Africa. *British Journal of Sociology of Education*, Vol 11(1).

CHRISTIE, P. (1993). Equality and Curriculum Policy in Post-Apartheid South Africa. *Journal of Education*. Vol 18(1).

CILLIERS, C.D. *et al* (1994). *Keys to Thinking*. Johannesburg: Upttrail.

- COHEN, L. and MANION, L. (1989). *Research Methods in Education*. London: Routledge.
- COLES, M.J. (1993). Teaching Thinking : Principles, Problems and Programmes. *Educational Psychology*. Vol 13(3,4).
- COSTA, A.L. ed. (1985). *Developing Minds : A Resource Book for Teaching Thinking*. Association for Supervision and Curriculum Development (ASCD).
- COSTA, A.L. and MARZARNO, R. (1987). Teaching the Language of Thinking. *Education Leadership* Vol 45(2) p29-34.
- DA COSTA, Y., JULIE, C. and MEERKOTTER, D. (eds). (1994). *Let the Voices be Heard*. Cape Town: Wyvern Publications.
- DAVIDOFF, S. and VAN DEN BERG, O. (1990). *Changing your Teaching : the Challenge of the Classroom*. Pietermaritzburg: Centaur.
- DAVIDOFF, S., JULIE, C., MEERKOTTER, D. and ROBINSON, M. (1993). *Emancipatory Education and Action Research*. Pretoria: HSRC.
- DE BONO, E. (1976) : *Teaching Thinking*. London: Temple Smith.
- DE BONO, E. (1973). *CoRT 1 : Teachers' Handbook*. Oxford: Pergamon.
- DE BONO, E. (1991). The Direct Teaching of Thinking in Education and the Cort Method. In Maclure, S. and Davies, P. (eds). *Learning to Think : Thinking to Learn*. Oxford: Pergamon for OECD.
- DRINAN, J. (1991). *Problem-based Learning*. In Bond, D. and Feletti, G. (eds). St. Ives: Clays Ltd.
- ELLIOTT, J. (1978 a). What is Action Research in Schools? *Journal of Curriculum Studies*. 10(4) p355-357.

- ELLIOTT, J. (1990). Teachers as Researchers : Implications for Supervision and for Teacher Education. *Teaching and Teacher Education*. Vol 6(1).
- ENNIS, R. (1985). Goals for a Critical Thinking Curriculum. In Costa A (ed). *Developing Minds : A Resource Book for Teaching Thinking*. ASCD.
- ENNIS, R. (1987). A Taxonomy of Critical Thinking Dispositions. In Baron, J. and Sternberg, R. *Teaching Thinking Skills : Theory and Practice*. New York: Freeman.
- ENSLIN, P. (1994). Should Nation Building be an Aim of Education? *Journal of Education (Natal)* 1994. Vol 19(1). Faculty of Education, University of Natal, Pietermaritzburg.
- EVANS, D. and WALLACE, B. (1994). *TASC : A Starter Kit*. In press. Curriculum Development Unit, University of Natal, Pietermaritzburg.
- FEUERSTEIN, R., JENSEN, M., HOFFMAN, M.B. and RAND, Y. (1985). *Instrumental Enrichment, an Intervention Programme for Structural Cognitive Modifiability : Theory and Practice*. In J.W. Segal, S.F. Chipman, and R. Glaser (eds). *Thinking and Learning Skills*, Vol 1 p43-82 Hillsdale, N.J.: Lawrence Erlbaum.
- FEUERSTEIN, R., RAND, Y., HOFFMAN, M.B. and MILLER, R. (1980). *Instrumental Enrichment : An Intervention Programme for Cognitive Modifiability*. Baltimore MD: University Park Press.
- FEUERSTEIN, R. and HOFFMAN, M.B. (1988). Experimental Version of Manual for New Edition. Hadassah - WIZO. Canada Research Institute.
- FISHER, R. (1987). *Problem-solving in Primary Schools*. Oxford: Basil Blackwell.
- FISHER, R. (1990). *Teaching Children to Think*. Herts.: Simon and Schuster Education.

- FLANAGAN, W. (1992). Reading Programmes : Are they the Best Form of Intervention in our Schools? *Perspectives in Education* Vol 6(1).
- FLAVELL, J.H. (1985). (2nd ed) *Cognitive Development*. New York: Prentice-Hall.
- FLAVELL, J.H. (1979). Metacognition and Cognitive Monitoring : A New Area of Cognitive-Development Enquiry. *American Psychologist*. Vol 34 p906-911.
- FULLAN, M.G. (1991). *The New Meaning of Educational Change*. New York: Teachers College Press.
- GALLIMORE, R. and THARP, R. (1991). Teaching Mind in Society : Teaching, Schooling and Literate Discourse. In Moll L C (ed). *Vygotsky and Education : Instructional Implications and Applications of Socio-historical Psychology*. Cambridge, Mass: Cambridge University Press.
- GARDNER, H. (1983). *Frames of Mind : The Theory of Multiple Intelligences*. New York: Basic Books.
- ✓ GIDDENS, A. (1989). *Sociology*. Cambridge: Polity.
- GLASER, R. (1984). Education and Thinking : The Role of Knowledge. *American Psychologist*. 39 p93-104.
- GLASER, B. and STRAUSS, A.L. (1967). *The Discovery of Grounded Theory : Strategies for qualitative research*. Chicago: Aldine.
- GOODLAD, J. (1984). *A Place Called School : Prospects for the Future*. New York: McGraw Hill.
- ✓ GORDON, P. (ed) (1981). *The Study of the Curriculum*. London: Batsford, Academic & Educational Ltd.

- HERNSTEIN, R.J., NICKERSON, R.S., DE SANCHEZ, M. and SWETS, J.A. (1986). Teaching Thinking Skills. *American Psychologist*. Vol 41 p1279 -1289.
- HOEKTER, J. and AHLBRAND, W. (1969). The Persistence of Recitation. *American Journal of Educational Research* Vol 6 p145-167.
- HOPKINS, C.D. (1980). *Understanding Educational Research : an Inquiry Approach*. Columbus, Ohio: Merrill.
- HOPKINS, D. (1985). *A Teacher's Guide to Classroom Research*. Open University.
- ISAKSEN, S.G. (1987). *Frontiers of Creativity Research. Beyond the Basics*. Buffalo, New York: Bearly.
- HUSTLER, D., CASSIDY, T. and CUFF, T. (1986). *Action Research in Classrooms and Schools*. London: Allen & Unwin.
- JOHNSON, S. (1990). Understanding Curriculum Decision-making through Teacher Images. *Journal of Curriculum Studies* 22(5) p463-471.
- JOHNSON, D.W. and JOHNSON, R.T. (1974). *Joining Together : Group Theory and Group Skills*. New Jersey: Prentice Hall.
- JOYCE, B.R. and SHOWERS, B. (1981). Transfer of Training : The Contribution of 'Coaching'. *Journal of Education*, (2) p163-172.
- KELCHTERMANS, G. and VANDENBERGHE, R. (1994). Teachers' Professional Development : a Biographical Perspective. *Journal of Curriculum Studies*, Vol 26(1) p45-62.
- KEEVES, J.P. (ed). (1988). *Educational Research, Methodology and Measurement : An International Handbook*. London: Pergamon Press.

- KEMMIS, S. (1988). *Action Research*. In Keeves J P (ed). *Educational Research, Methodology and Measurement : An International Handbook*. London 1988, Pergamon Press.
- KING, M. and van den BERG, O. (1991). *The Politics of Curriculum Structures and Processes*. Pietermaritzburg: Centaur.
- KING, M. and van den BERG, O. (1991). *A Curriculum Model for Education in South Africa*. Pretoria: D.N.E.
- KORNHABER, M.L. and GARDNER, H. (1991). Critical Thinking across Multiple Intelligences. In Maclure, S. and Davies, P. (eds). *Learning to Think : Thinking to Learn*. Oxford: Pergamon.
- LINK, F.R. (1991). Instrumental Enrichment: a Strategy for Cognitive and Academic Improvement. In Maclure, S. and Davies, P. (eds). *Learning to Think: Thinking to Learn*. Oxford: Pergamon Press.
- LIPMAN, M. (1991). *Strengthening Reasoning and Judgement through Philosophy*. Upper Montclair, New Jersey: IAPC.
- LIPMAN, M. (1993). Philosophy for Children. *Educational Psychology*. Vol 13(3,4).
- LIPMAN, M., SHARP, A.M. and OSCANYAN, F.S. (1980). *Philosophy in the Classroom*. Philadelphia: Temple University Press.
- MACLURE, S. and DAVIES, P. (eds). (1991). *Learning to Think : Thinking to Learn*. Oxford: Pergamon for OECD.
- MACLURE, S. (1991). Introduction : An Overview. In Maclure, S. and Davies, P. *Learning to Think : Thinking to Learn*. OECD Conference: Pergamon Press.
- MARZANO, R.J. et al (1988). *Dimensions of Thinking : A Framework for Curriculum and Instruction*. Alexandria, VA.: Association for Supervision and Curriculum Development.
- MARSH, C. and STAFFORD, K. (1988). 2nd ed. *Curriculum : Practice and Issues*. Sydney: McGraw Hill.

MATHFIELD, M.J. (1992). *Problems Related to the Teaching of Thinking Skills*. M.Ed Thesis : University of Natal, Pietermaritzburg.

MATHFIELD, J. (1994). *Network Committee Report (Natal-KwaZulu Region)*. Natal Education Department, Pietermaritzburg.

McKERNAN, J. (1991). *Curriculum Action Research: a Handbook of Methods and Resources for the Reflective Practitioner*. London: Kogan Page.

McNAUGHT, C. and RAUBENHEIMER, D. et al (1991). *Critical Reflections on Teachers in Action : an Evaluation Report of the Natal Primary Science Project*. The Natal Primary Science Project. The Urban Foundation. Durban.

McNAUGHT, C. and RAUBENHEIMER, D. (1992). *Workshops, can they work?* Science Curriculum Initiative, M. Keogh and C.D. Raubenheimer, Occasional Paper (1).

McNIFF, J. (1988). *Action Research : Principles and Practice*. London: MacMillan Education.

McTIGHE, J. and SCHOLLENBERGER, J. (1985). *Why Teach Thinking : A Statement of Rationale*. In Costa, A.L. (ed). *Developing Minds : A Resource Book for Teaching Thinking*. Association for Supervision and Curriculum Development.

MENTIS, M. et al : (1993). *Illustrating Instrumental Enrichment*. Working Manual. Vol 3 of Manual Series. Cognitive Research Programme, Division of Specialised Education. University of the Witwatersrand, Johannesburg.

MILLAR, C.J. (1983). *Educational Case Studies : An Introduction to a Research Perspective*. In *Research Methods for Higher Degrees*. Faculty of Education, University of Cape Town.

- MOLL, L.C. (1990) (ed). *Vygotsky and Education : Instructional Implications and Applications of Socio-Historical Psychology*. Cambridge, Mass; Cambridge University Press.
- MONTEIRO-SIEBURTH, M. (1992). Models and Practice of Curriculum Change in Developing Countries. *Comparative Education Review*. May 1992.
- MOSSOM, F.Y. (1989). *Science Teaching by means of the Process Approach in the Primary School*. M.Ed. thesis : University of South Africa.
- MOUTON, J. (1988). The Philosophy of Qualitative Research. In *Introduction to Qualitative Research Methods*. Pretoria: HSRC Press.
- MOUTON, J. and MARAIS, H.C. (1988). *Basic Concepts in Methodology of Social Sciences*. Pretoria: HSRC Press.
- MUTHUKRISHNA, N. and BORKOWSKI, J. (19...). *Constructivism and the Motivated Transfer of Skills*. [s.l.] [s.n.].
- NEPI (National Education Policy Investigation) (1992). *Curriculum*. Cape Town: Oxford University Press Research Group.
- NICKERSON, R.S. (1988). On Improving Thinking through Instruction. *Review of Research in Education*. Vol 15 p3-57.
- NICKERSON, R.S. (1987). Why Teach Thinking? In Baron, J.B. and Stenberg, R.J. *Teaching Thinking Skills : Theory and Practice*. New York: Freeman.
- NICKERSON, R., PERKINS, D. and SMITH, E. (1985). *The Teaching of Thinking*. New York: Lawrence Erlbaum.
- NISBET, J. (1980). Education Research : The State of the Art. In Dockness, W.B. and Hamilton, D. (eds). *Rethinking Educational Research*. London: Hodder and Stoughton.

- NISBET, J. (1993). The *Thinking Curriculum*. *Educational Psychology*. Vol 13(3,4).
- NISBET, J. and SHUCKSMITH, J. (1986). *Learning Strategies*. Boston: Routedledge and Kegan Paul.
- ORPEN, R.C. (1987). Teaching in the Primary School in the Republic of South Africa. D.Ed. Thesis : University of the OFS.
- OXFORDSHIRE SKILLS PROGRAMME. (1987) Wheatley: Oxon County Council Education Unit.
- PALINSCAR, A.S. and BROWN, A.L. (1984). Reciprocal Teaching of Comprehension: Fostering Metacognitive Strategies. *Cognition and Instruction*, 1 p117-175.
- PAPERT, S. (1980). *Mind-storms : Children, Computers and Powerful Ideas*. Harvester: Brighton.
- PATERSON, L., SANTA, C.M., SHORT, K.G. and SMITH, K. (1993) (eds). *Teachers are Researchers : Reflections in Action*. International Reading Association, Inc.
- PAUL, R.W. (1984). Critical Thinking : Fundamental to Education for a Free Society. *Educational Leadership*. Vol 41 p4-14.
- PAUL, R.W. (1987). Dialogical Thinking : Critical Thought Essential to the Acquisition of Rational Knowledge and Passions. In Baron, J. and Sternberg, R. (eds). *Teaching Thinking Skills: Theory and Practice*. p127-149: New York: W H Freeman and Company.
- PENNEFATHER, J. (1991). *An Exploration of Selected Teaching Strategies and Content in a South African School to Create an Awareness of Prejudice*. M.Ed. Thesis. Department of Education, University of Natal, Pietermaritzburg.
- PERKINS, D.N. (1985). What Creative Thinking Is. In Costa, A. (ed). *Developing Minds : A Resource Book for Teaching Thinking* : ASCD.

- PERKINS, D. (1992). *Smart Schools : From Training Memories to Educating Minds*. New York: Free Press.
- PERKINS, D.N. (1994). Rationale for the Architecture of a Thinking Course : the Challenge of Better Thinking and Learning. Johannesburg: Upttrail Trust.
- PERKINS, D.N. and SALOMON, G. (1988). Teaching for Transfer. *Educational Leadership*. Vol 41 p22-32.
- PERKINS, D.N. and SALOMON, G. (1989). Are Cognitive Skills Context-bound? *Educational Researcher*. Vol 18(1) p16-25.
- PERKINS, D.N., LOCHHEAD, J. and BISHOP, J. (1987). (eds). *Thinking : The Second International Conference*. New Jersey: Lawrence Erlbaum.
- POLLARD, A. and TANN, S. (1987). *Reflective Teaching in the Primary School*. London: Cassell.
- POLYA, G. (1957). *How to Solve it : A New Aspect of Mathematical Method*. Princeton NJ: Princeton University Press.
- POPPER, K. (1972). *Objective Knowledge*. Oxford University Press.
- PRESSEISEN, B. (1985). Thinking Skills : Meanings and Models. In Costa, A. (ed). *Developing Minds: A Resource Book for Teaching Thinking*: ASCD.
- PRIDEAUX, D. (1993). School-based Curriculum Development : Partial, Paradoxical and Piecemeal. *Journal of Curriculum Studies*. Vol 25(2) p169-178.
- PUHL, C.A. (1991). Does the Teaching of Thinking Promote Language Acquisition? *Per Linguam*. Vol 7(2) p27-36.

- RAUBENHEIMER, D. (1992/1993). An Emerging Approach to Teacher Development : Who Drives the Bus? *In Perspectives in Education*. Vol 14(1).
- RESNICK, L. (ed) (1984). *Knowing, Learning and Instruction*. Hillsdale, N J: Lawrence Erlbaum.
- RESNICK, L. (1987). *Education and Learning to Think*. Washington DC. : National Academic Press.
- RIDING, R.J. and POWELL, S.D. (1993). Thinking and Education. *Education Psychology*. Vol 13(3,4).
- ROGERS, C. (1985). Freedom to Learn. In Entwistle N. *New Directions in Educational Psychology (1): Teaching and Learning*. London: Falmer Press.
- SABAR, N. (1985). School-based Curriculum Development : Reflections from an International Seminar. *Journal of Curriculum Studies*. Vol 17(4)p452-454.
- SALOMON, G. and PERKINS, D.N. (1989). Rocky Roads to Transfer : Re-thinking Mechanisms of a Neglected Phenomenon. *Educational Psychologist*. Vol 24(2) p113-142.
- SCHMUCK, R.A. and SCHMUCK, P. (1988). *Group Processes in the Classroom*. Iowa: WMC Brown.
- SCHRAG, F. (1987). The Classroom as a Place for Thinking. In Perkins D N, Lochhead J and Bishop J (eds). *Thinking : The Second International Conference*. N.J. Lawrence Erlbaum.
- SEGAL J, CHIPMAN, S. and GLASER, R. (eds). (1985). *Thinking and Learning Skills*. Hillsdale, NJ. Lawrence Erlbaum.
- SHARRON, H. (1984). *Changing Children's Minds : Feuerstein's Revolution in the Teaching of Intelligence*. London: Souvenir Press.

- SHIPMAN, M. (1981). *The Limitations of Social Research*. London: Longman.
- SHOWERS, B. (1983). *Transfer of Training : The Contribution of 'Coaching'*. The University of Oregon Centre for Education Policy and Management.
- SHOWERS, J., JOYCE, B., BENNETT, B. (1987). Synthesis of Research on Staff Development : A Framework for Future Study and a State-of-the-art Analysis. *Educational Leadership*. Vol 45 Nov(77-87).
- SKUY, M., MENTIS, M., NKWE, I., ARNOTT, A. and HICKSON, J. (1990). Combining Instrumental Enrichment and Creativity / Socio-Emotional Development for Disadvantaged Gifted Adolescents in Soweto, Part 1. *International Journal of Cognitive Education and Mediated Learning*. Vol 1(1)25.
- SLAVIN, R. (1980). Co-operative learning. *Review of Educational Research*. Vol 59(2)p315-342.
- STENHOUSE, L. (1975). *An Introduction to Curriculum Research and Development*. London: Heineman.
- STENHOUSE, L. (1983). *Education and Emancipation*. London: Heinemann.
- STERNBERG, R., CONWAY, B.E., KETRON, J.L. and BERNSTEIN, M. (1981). People's Conceptions of Intelligence. *Journal of Personality and Social Psychology*. Vol 41(3) p37-55.
- STERNBERG, R.J. (1983). Criteria for Intellectual Skills Training. *Educational Researcher*. Vol 12 p6-12.
- STERNBERG, R.J. (1985 a). Teaching Critical Thinking Part I : Are We Making Critical Mistakes? *Phi Delta Kappan*. Vol 67 p194-198.

- STERNBERG, R.J. (1987). Questions and Answers about the Nature and Teaching of **Thinking Skills**. In Baron, J.B. and Sternberg, R.J. (eds). *Teaching Thinking Skills : Theory and Practice*.
- STERNBERG, R.J. (1987). Teaching Intelligence : The Application of Cognitive Psychology to the Improvement of Intellectual Skills. In Baron, J.B. and Sternberg, R.J. (eds). *Teaching Thinking Skills : Theory and Practice*. New York: Freeman.
- STERNBERG, R.J. (1990). *Metaphors of Mind : Conceptions of the Nature of Intelligence*. Cambridge: Cambridge University Press.
- SWARTZ, R.J. (1987). Teaching for Thinking : A Developmental Model for the Infusion of **Thinking Skills** into Mainstream Instruction. In Baron, J. and Sternberg, R.J. (eds). *Teaching Thinking Skills : Theory and Practice*. New York: Freeman.
- TAYLOR, S.J. and BOGDAN, R. (1984). *Introduction to Qualitative Research Methods: the Search for Meanings*. New York: John Wiley.
- THARP, R.G. and GALLIMORE, R. (1988). *Rousing Minds to Life : Teaching Learning and Schooling in Social Context* Mass; Cambridge University Press.
- THIESSEN, D. (1992). Classroom-based Teacher Development. In *Understanding Teacher Development* by Hargreaves, A. and Fullan, M.G. New York: Cassell.
- TORRANCE, E. Paul. (1976). *Guiding Creative Talent*. New York: Hurlington.
- VAN DEN BERGH, O. (1994). The Politics of Curriculum Change. In Da Costa et al (eds). *Let the Voices be Heard*. Cape Town: Wyvern Publications.
- VAN DER VYVER, D.H. (1994). *Keys to Thinking in Primary Education*. Johannesburg: Upttrail.

- VAN DER BERGH, C. (1988). The Methodology of Participant Observation. In *Introduction to Qualitative Research Methods*. Module 3. Pretoria: HSRC.
- VON HIRSCHFELD, S. and DOWNS, S. (1992). Change through Understanding. *People Dynamics*. Vol 10(8)p27-28.
- VYGOTSKY, L.S. (1978). *Mind in Society. The Development of Higher Psychological Processes*. Cole M et al (eds). Cambridge: Harvard University Press.
- WALKER, M. (1990). Action Research in South African Schools : Gilding Gutter Education or Transforming Teaching? *Perspectives in Education*. Vol 11(2) p57-64.
- WALKER, R. (1985). *Doing Research*. London: Methuen.
- WALLACE, B. and ADAMS, H.B. (1993). *TASC: Thinking Actively in a Social Context*. Bicester, U.K.: A B Academic Publishers.
- WALLACE, B. (1993). TASC: Thinking Actively in a Social Context, in *Education Alive!* Vol 1 (2) p15: Medu, University of Natal. Pietermaritzburg.
- WASHINGTON, H.N. (1987). *The Effects of a Thinking Skills Staff Development Project on the Reading Achievement of Chapter 1 Students*. M Ed Thesis, Maryland College Park: UMI.
- WERTSCH, J.V. (1985b). Introduction. In Wertsch J V. *Culture, Communication and Cognition: Vygotskian Perspectives*. New York: Cambridge University Press.
- WHIMBEY, A. and LOCHHEAD, J. (1984). *Beyond Problem-solving and comprehension : An Exploration of Quantitative Reasoning*. Hillsdale, New Jersey: Lawrence Erlbaum.

- WHIMBEY, A. (1985). Test Results from Teaching Thinking. In Costa, A. (ed). *Developing Minds : A Resource Book for Teaching Thinking*. ASCD.
- WILLIAMS, W. M. and STERNBERG, R.J. (1993). Seven Lessons for Helping Children Make the Most of their Abilities. *Educational Psychologist*. Vol 13(3,4).
- WINOCUR, S.L. (1985). Project IMPACT. In Costa, A. (ed). *Developing Minds: A Resource Book for Teaching Thinking*, ASCD.
- WINTER, R. (1987). *Action-Research and the Nature of Social Inquiry: Professional Innovation and Educational Work*. Avebury: Gower Publishing Company Ltd.
- WRIGHT, E. (1985). Odyssey : A Curriculum for Thinking. In Costa, A. (ed). *Developing Minds : A Resource Book for Teaching and Thinking*. ASCD.
- ZIMMERMAN, B.J. and SCHUNK, D.H. (1989). *Self-regulated learning and academic achievement. Theory, Research and Practice*. New York: Springer-Verlag.
- ZIMMERMAN, B.J. (1989). Models of Self-Regulated Learning and Academic Achievement. In Zimmerman, B.J. and Schunk, D.H. (eds). *Self-Regulated Learning and Academic Achievement : Theory, Research and Practice*. New York: Springer-Verlag.

PILOT PROJECT'**THINKING ACTIVELY IN A SOCIAL CONTEXT (TASC)
(a *Networking Initiative*)****1. ROLE-PLAYERS**

- 1.1 The University of Natal (Mrs Belle Wallace)
- 1.2 Departmental Officials / teachers
- 1.3 The Environmental Education Initiative (Mr Rob O'Donoghue)
- 1.4 The Joint Interdepartmental Committee on Primary Education (JIC)

2. THE PILOT PROJECT

- 2.1 One primary school from each of the five departments in the vicinity of Pietermaritzburg is to be identified as a pilot school for the application of the TASC model.

2.2 OBJECTIVES

- 2.2.1 To empower teachers and pupils in the vitally-important sphere of thinking.
- 2.2.2 To obtain further evidence of the viability of the model (TASC) in primary education.
- 2.2.3 To facilitate networking among educators from the different departments in an area of common concern.
- 2.2.4 To develop an awareness and appreciation of environmental issues and problems.

4. PROPOSED PROGRAMME

- 4.1 The pilot project is to be applied for the duration of 1994.
- 4.2 An information meeting (afternoon) for participating teachers from the five identified schools in Pietermaritzburg district will be presented by Mrs Belle Wallace on 19 November 1993.

THE PROPOSED NETWORKING / THINKING-SKILLS / ENVIRONMENTAL EDUCATION PILOT PROJECT

(The learning and application of the TASC model in an environmental setting.)

1. ROLE-PLAYERS

1.1 THE JOINT INTERDEPARTMENTAL COMMITTEE ON PRIMARY EDUCATION (JIC)

1.2 THE UNIVERSITY OF NATAL

1.3 REPRESENTATIVES OF THE ENVIRONMENTAL EDUCATION INITIATIVE (EEI)

2. APPLICATION

One school from each of the five education departments within the:

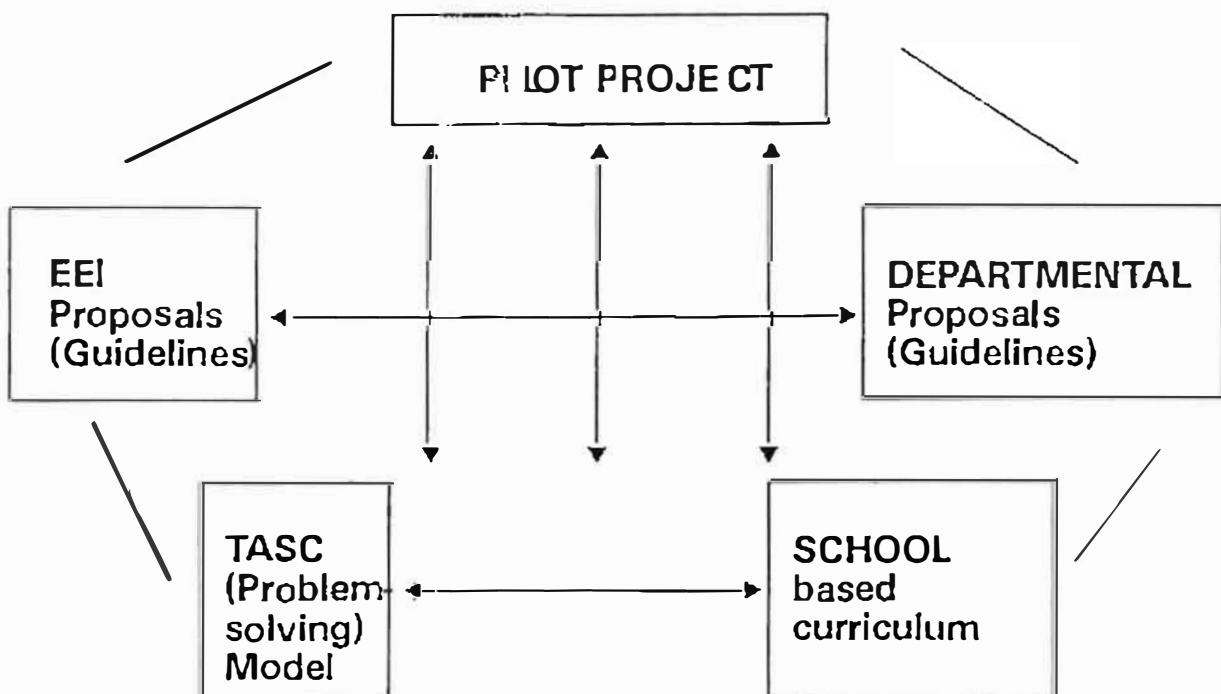
- (i) Pietermaritzburg district; and
- (ii) Durban district. (Possible duplication of the Pmb Project next year)

2.2 POSSIBLE STEERING COMMITTEE

Representatives from:

- JIC
- Natal University
- EEI (Resources)

1.3 INFLUENCES AND IMPLICATIONS (SHAPING THE PROPOSED CURRICULUM)



COMPARISON GRID OF RESPONSES TO FOCUSED GROUP DISCUSSION - WORKSHOP 1 - JANUARY, 1994

School	1) Problems in Teaching	2) Help needed	3) Perception of TASC	4) Expectations for: 1. Selves, 2. Pupils, 3. Curriculum
A	No instruments and apparatus/libraries or labs; poor textbooks; childrens scope of knowledge very limited; medium of instruction; age range in one class; pupil teacher ratio 1:70 (individual attention not possible); content irrelevant; isolation; lack of opportunity to share; involvement of parents lacking; expectations of superiors pressurising; illiterate parents	Inservice training for teachers; more teachers should be appointed; There should be subject specialisation; equipment should be provided by the government; Principals must be informed about the courses; parents to be more involved; there should be libraries; more time for English; it is the medium of instruction	TASC is trying to say: The context should be relevant and pupils should think creatively. It (TASC) can solve problems we encounter; coming together and sharing of ideas is of utmost importance	<ol style="list-style-type: none"> 1. To achieve modern and functional teaching skills 2. Pupils must be actively involved in the learning situation and we expect them to be knowledgeable 3. Curriculum: it should be functional and relevant
B	Lack of resources/apparatus/equipment; large class groups; individual pupil abilities - need for remedial - need for extension - within one class; syllabus - irrelevant/unsuitable; parents sensitive to sections of health and family life - syllabus needs to be flexible; pupils' background experiences; great age range in one class; 30 - min periods restricting; teaching load; prep time; tests; exams too rigid; arrangement of pupils in a class group - too formal; lack of curriculum materials for teaching 'thinking'	Curriculum material; resource material - for Thinking Skills; evaluation techniques for this; space; co-ordination and integration of TASC with present situation at schools; help with application of TASC	TASC develops the child's thinking abilities - to cope with problem situations; teaches what is relevant to the child; child to be active participant in the learning situation; to be an independent learner; to share learning experiences	<ol style="list-style-type: none"> 1. Review our teaching methods - lessons to be pupil-centred; to teach problem-solving activities. 2. Active participants in learning situation <ul style="list-style-type: none"> - communication skills to improve - to be problem-solvers "thinkers" with enquiring minds 3. Curriculum change - emphasis on thinking skills - to be more relevant; specialisation vs generalisation

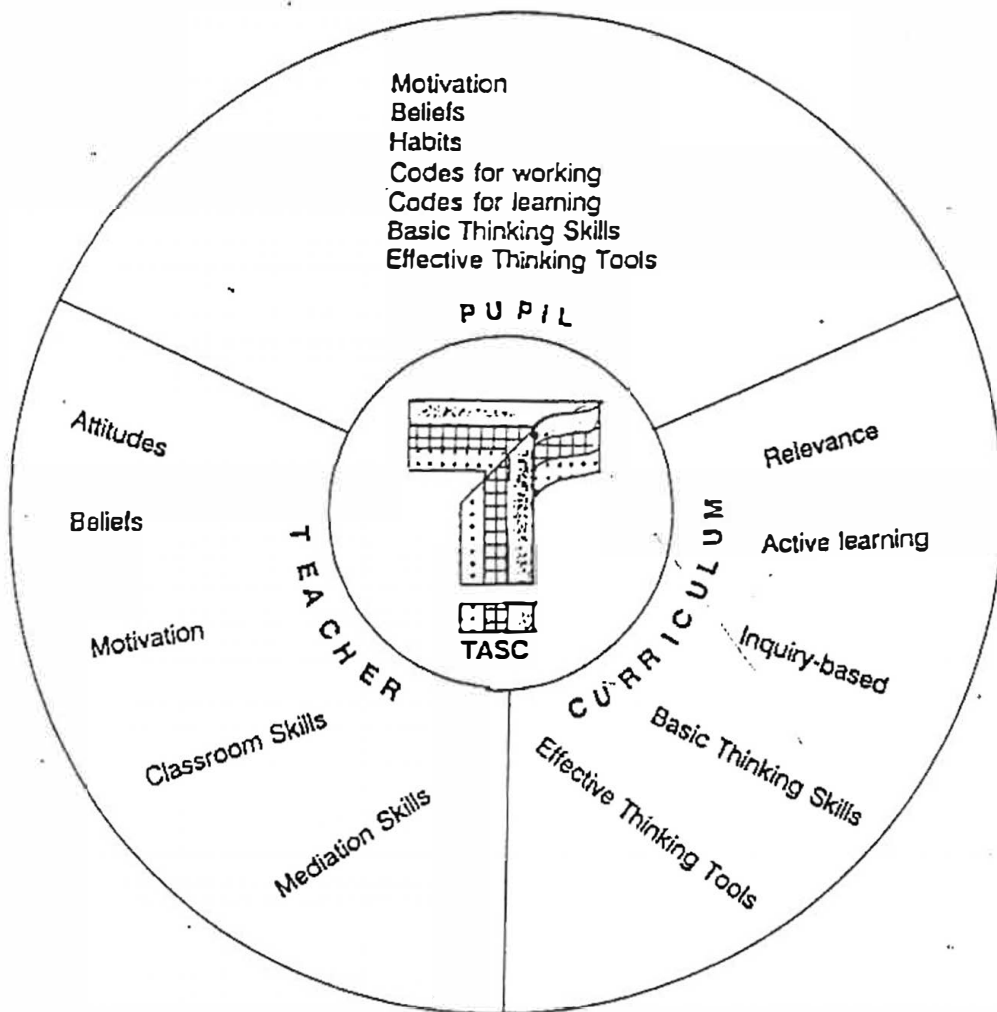
COMPARISON GRID OF RESPONSES TO FOCUSED GROUP DISCUSSION - WORKSHOP 1 - JANUARY 1994 (continued)

School	1) Problems in Teaching	2) Help needed	3) Perception of TASC	4) Expectations for: 1. Selves, 2. Pupils, 3. Curriculum
C	Language - lack of response from many pupils; Teachers can't speak Zulu; instruction different for these children; no audio-visual equipment; no labs; no research centre/shortage of stock eg. litmus and books; furniture; no staff lockers; cupboards; no staff room; number of pupils \pm 36 - discomfort in heat and cold; no transport - for field trips/sport; poor community - some no breakfast; limited finances; uneven distribution of subjects; time-tabling - syllabus constraints: no time	More parent involvement; workshops on language problems; need subject rooms; less departmental cutbacks; upgrading of present library to research centre standards; working knowledge of Zulu networking with other schools/teachers	TASC - "A programme to develop thinking skills"	<ol style="list-style-type: none"> 1. Improvement in teaching methods; a broader involvement interaction amongst teachers; sharing of ideas 2. New methods for learning (thinking skills; study skills); independent; active learners become responsible 3. Curriculum - ?
D	Sizes of classes; teacher assistants for J.P.; individual abilities; language and communication; cultural differences; time - work load; money (eg. for excursions)	Help with resource material for J.P. (lack of this)	TASC is "Child-centred" teacher = facilitator	<ol style="list-style-type: none"> 1. For ourselves - we want something tangible 2. For pupils something practical 3. For curriculum - something applicable to real world
E	Poor understanding due to language; vocabulary difficulties; we do not have teaching aids in our schools; poor quality and very few text books; lack of relevance; class sizes - big; no money; isolation; ignorance of children and community	We need laboratories and apparatus; we need examples of teaching lessons; we need lesson notes; we need help with classroom management; organization of our teaching; we need marking skills; we need help in the school; we need more help with language; more parental involvement	TASC: To develop thinking skills and communication	<ol style="list-style-type: none"> 1. To get new techniques and methods of how to go about your lessons. 2. Thinking skills; communication, study skills; pupils to be involved in learning 3. Small changes for the curriculum to be updated

COMPARISON OF SIMILARITIES AND DIFFERENCES IN RESPONSES: PROBLEMS/HELP/PERCEPTIONS AND EXPECTATIONS

Problems	Help Needed	Perception of TASC	Expectations'
1. Lack of Resources Material resources, teaching aids/ apparatus, equipment - laboratories, libraries in schools A B C and E	1. Equipment/materials A, C, E	1. TASC would teach thinking skills: A B C and E. TASC would improve communication: school E	1. <u>For teachers:</u> to improve teaching skills, methods A B C and E School D wanted something 'tangible'
2. Problems with the language Medium of instruction in schools A C and E. Poor understanding due to this. Not mentioned in school B and only as it affected a very few pupils in school D whose first language was not English	2. Curriculum materials for teaching purposes (eg. lesson notes,) B, D, E	2. TASC would be more child- centred B and D	2. <u>For pupils:</u> a) To be active participants A B C and E b) Independent thinkers B and C c) Better communication skills B and E
3. Background experiences of the children This was mentioned by schools A B C and E - implying that they come to school with limited knowledge or are affected by their backgrounds. School D did not mention this	3. More parental involvement A, C, E	3. TASC would aim for relevance A and B	3. <u>For the curriculum.</u> <u>Relevance</u> A B and D
4. Large classes Mentioned by all Teaching loads and time pressures - Schools B and D	4. More INSET and networking A, C and E in general, School B - more specifically for thinking skills	4. TASC would promote sharing of learning experiences A and B	
5. Individual differences and abilities Schools A B and D	5. Help with language A, C and E	5. TASC would help with problem-solving A and B	
6. Lack of relevance of the curriculum Schools A B and E	6. More help with teaching skills E	6. Teacher as facilitator D	

THE AIMS OF TASC



Appendix 4

Observation Checklist

Is there any interaction between teacher and pupils ?

Did the teacher build on prior knowledge - provide scaffolding?

Could the teacher relate bits of the syllabus to real-life issues i.e. make the content relevant ?

How did they model 'thinking' behaviour ?

Did they give time for reflection?

Did they address the pupils' self-concept ?

How did they manage the group work?

Did they give feedback on errors ?

Did they teach for transfer?

Did they pay attention to metacognitive aspects?

Was the teacher a good questioner ?

Was the teacher a good listener ?

Appendix 5

Workshop 1 - January, 1994 (Participants grouped in their schools)

Questions for Focused Group Discussion

1. In school, what are your problems in teaching your particular subjects ?
2. What help do you think you need ?
Specify areas
3. What are your perceptions of TASC at this point ?
What is it all about ?
4. What are your expectations of TASC
 - for yourselves, as teachers
 - for your pupils
 - for the curriculum






The responses from Schools A, B, C, D and E were analysed and entered on a Comparison Grid (Appendix 2) for the purposes of identifying needs and understanding the situations of each school context.

Semi-structured Interview

(This basic structure was used throughout the year. It was modified or extended according to the extent to which each individual teacher had attempted to implement the Thinking Skills at the time of the interview. This allowed for personal growth and understanding of the curriculum innovation to develop with time, according to individual capabilities. In this way the probing of perceptions was on-going - in keeping with the action research approach.)

1. What have you gained from the Tasc Workshops so far?
2. Have you had any opportunity to share with colleagues and staff what you learned at the Workshop?
3. Have you tried any of the Thinking Skills with your class?
4. Were there any changes in the way the pupils responded?
5. Can you identify any difficulties with the implementation of the Thinking Skills right now?
6. What do you look forward to at the next joint Workshop?

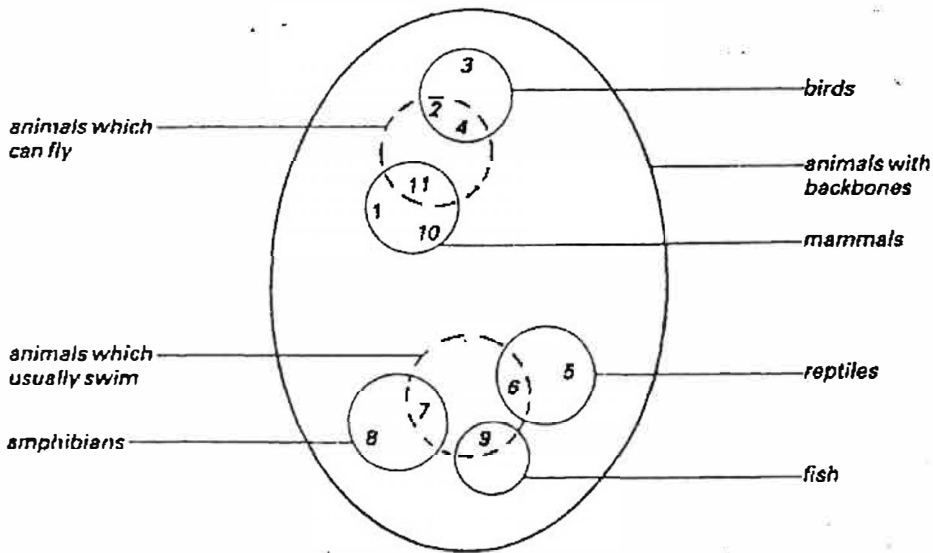
COMPARISON OF VERTEBRATES

	BACKBONE present/ absent	BODY COVERING	NO.OF BODY DIVISIONS	LOCOMOTORY ORGANS	BREATHING ORGANS	FERTILISATION external/ internal	PARENTAL CARE present/ absent
1. <u>FISH</u> 							
2. <u>AMPHIBIANS</u> 							
3. <u>REPTILES</u> 							
4. <u>BIRDS</u> 							
5. <u>MAMMALS</u> 							

ACTIVITY ONE

Here is a list of animals that live in the Kruger National Park. Elephant, lion, fruit bat, crocodile, python, ostrich, eagle owl, secretary bird, carp, platanna toad, tree frog.

In the Venn diagram, the subsets contain all the animals in that group. Each number from 1 to 11 represents a different animal. For example, No.1 represents the elephant, a mammal that does not fly. Match each number to one of the animals in the list.



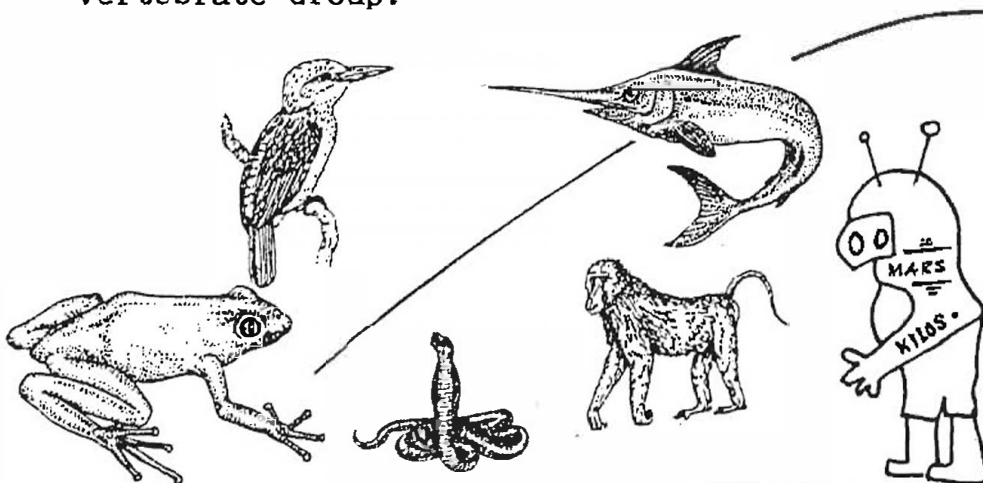
- Elephant - 1
- Lion -
- Fruit Bat -
- Crocodile -
- Python -
- Ostrich -
- Eagle Owl -
- Secretary Bird -
- Carp -
- Platanna Toad -
- Tree Frog -

ACTIVITY TWO

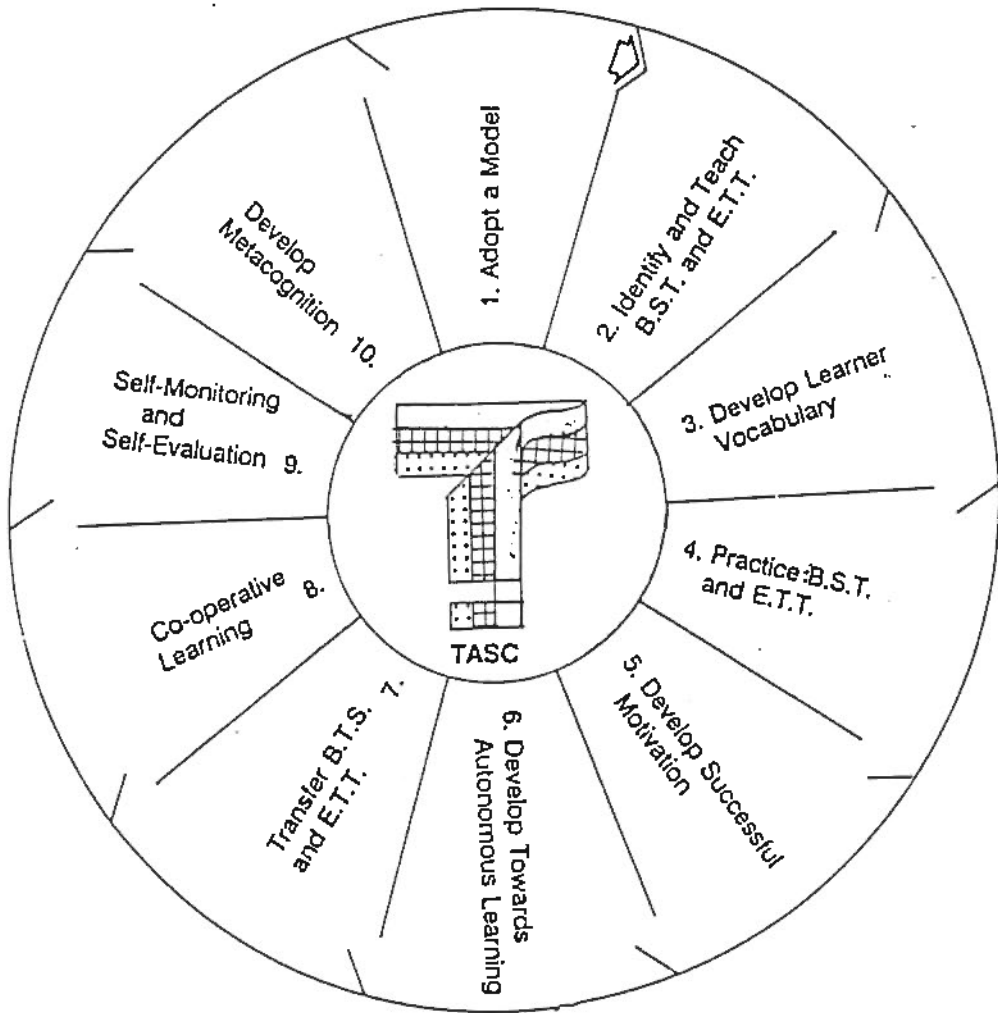
"PLANETARY PUZZLE"

After months of space travel and adventures, Captain Kilos and his crew from Planet Mars decided to take a holiday. They beamed down to our beautiful planet for a short break. Our planet is home to 5 groups of VERTEBRATE ANIMALS.

Help Captain Kilos and his crew to identify the 5 vertebrate groups. Make a key to help the explorers. Choose a name for each Vertebrate Group.



TASC TEACHING PRINCIPLES



The Ten Tasc Teaching Principles

1. **Adopt a model of the Problem-Solving Process and explicitly teach this.**
2. **Identify a set of Basic Skills and Thinking Tools and give training in these.**
3. **Develop a Vocabulary to suit the Learner.**
4. **Give ample practice in both the Basic Skills and the Thinking Tools.**
5. **Give attention to the Motivational aspects of Problem-solving.**
6. **The progression of teaching is from Modelling by the teacher to guided activity by the Learner, and eventually autonomous action by the Learner.**
7. **Teach for Transfer! Every effort must be made to enable the learner to transfer Thinking Skills and Tools to new contexts.**
8. **The emphasis is on co-operative learning in small groups.**
9. **Encourage pupils' self-monitoring and self-evaluation.**
10. **Students should be encouraged to develop their Metacognitive knowledge.**

METACOGNITION

This involves encouraging introspection about personal thinking strategies, their strengths and weaknesses. This does not mean that all learners use the same thinking strategies. Each learner develops a personal repertoire that is useful and suitable for the individual. The teaching methodology asks:

- What strategies did you use?
- How useful were they?
- Could you have used any others?
- Are you satisfied that the strategies you used were efficient?
- Are you satisfied with the whole problem-solving process you used?

Talk about the way the children went about their tasks. They learn from hearing about the successful strategies of their friends.

Appendix 9

Staff Workshop held at School A on 18 August, 1994

Points arising from group discussion on TASC and what teachers had learnt from it. They were asked to consider the aims of TASC.

GROUP A

1. Teach thinking
2. Free expression
3. Communication
4. Associate, see similarities
5. Thinking skills
6. Socialising of groups
7. Sharing ideas
8. Have fun of involvement
9. State and support
10. Argument
11. Creativity
12. Orderliness
13. Brain utilized to the maximum
14. The way of involving every child in classwork

GROUP B

1. To think for themselves
2. Develop individual thinking
3. To update children
4. Thinking actively in a social context
5. It helps pupils to compare

EXAMPLES OF PROBLEM SOLVING ACTIVITIES

Examples of Problem-Solving Activities
used at Staff Workshops
to give experience in co-operative group work,
to discuss the differences in thinking styles
and to demonstrate metacognition

(adapted from *Problem-solving in Primary Schools*
by Robert Fisher)

A MATHS PROBLEM

A CRATE OF COKES HOLDS 24 BOTTLES IN A RECTANGULAR
ARRAY, FOUR ROWS AND SIX COLUMNS.

CAN YOU PUT 18 COKES IN THE CRATE SO THAT EACH ROW AND
EACH COLUMN OF THE CRATE HAS AN EVEN NUMBER OF
BOTTLES IN IT ?

THE CANOE PROBLEM

Two men and two boys want to cross a river.
Their canoe will take one man or two boys.
How do they all get across ?

TASC WORKSHOP

VENUE : Natal Education College

DATE : 8 June 1994

1. Mr J. Mathfield welcomed teachers to the workshop and expressed his gratitude to TASC for its more formal initiative taken in the networking process. Barriers had been broken down in an informal way in other network committees, but TASC had set definite parameters and guidelines were filtering through to teachers. A report indicating the type of work being done since networking started last year, would be given to each teacher at the end of the workshop. TASC's work was also mentioned in this document.
2. Mr R. O'Donaghue then introduced an Enviro-Picture building activity to the teachers. It was played as a game by the teachers to demonstrate its use as a starter activity for environmental education lessons. The game pack was available at R15. Children could be asked to identify a problem they observe in the picture of the rural scene, and then see if they could come up with a solution to this problem. This would then lead to a practical application. e.g. Indumiso students identified soil erosion taking place along paths to the soccer fields. They then set about using rocks, plants, wire netting etc. to improve the situation.

The cards provided ideas for the development of cross curriculum theme packs.

Children must be encouraged to see and think for themselves, not just guess what the teacher would like them to see.

3. Debbie Evans gave teachers exercises to do in groups in order to teach them how to "prioritise," an important skill to teach children.

ACTIVITY : You are a child.
 You have R5-00.
 You want to buy sweets, a teacher has told the child to buy a pencil and rubber for school, a present for Mum, visit a friend in hospital and buy chips.

Discuss in the group and prioritise your list.

This teaches children to ask relevant questions e.g. who is the most important person? > teacher; > child; > Mum.

Which is the most important object needed?

Aim to please everyone eventually.

Teachers could also use the following words in this lesson:

ARRANGING in order

RANKING

ORDERING

PRIORITISING

4. Handouts on Brainstorming and a trial lesson on "points of view" were received by all teachers.
5. Last skills taught were COMPARING and POINTS OF VIEW. Teachers reported on successful lessons given utilising these skills.

Teachers were asked to give the lesson materials and outlines of these successful lessons to Debbie Evans who would make them available to all TASC teachers.



G. PRINSLOO
SUBJECT ADVISER : SOCIAL STUDIES
/11
10gprin6p1

REPORT BACK ON TASC WORKSHOPS

PRESENTER : MRS D. EVANS

Being an "observer" at the TASC workshops has indeed been a great privilege for me. In the 18 months that I have been a Subject Adviser in the Higher Primary Phase of D.E.T. schools, I have identified the great problem of rote learning and "textbook syndrome" teachers. Perhaps this outdated and meaningless methodology used by the teachers is a result of the disadvantaged backgrounds that most of the teachers are a product of. Notwithstanding, they are now being called upon to deliver quality education to the pupils and needless to say, they find this a daunting task.

At the first TASC meeting, I think that the D.E.T. teachers felt like fish out of water, completely out of their depth, confused but nevertheless interested. The methods discussed were completely foreign to them. However, through Mrs Evan's carefully planned courses, simple yet eloquent instruction and gentle encouragement, the D.E.T. teachers soon felt part and parcel of the group. Involvement in meaningful discussion groups and intriguing games eased the initial misgivings and helped to develop their self confidence. Shared ideas and reports of successful lesson ideas have certainly motivated the teachers to test their ability and imagination in their own classrooms.

An awareness has gradually been developed of the importance of thinking skills and this has motivated the teachers to plan and prepare lessons of a far more meaningful standard. On a recent school visit to ~~School A.~~ (the D.E.T. school participating in this project) it was most encouraging to note the improvement in the lesson material, presentation and methodology being used.

Follow up with the Black teachers is critical. Constant support in the initial stages is essential to boost their morale and I feel confident that a wonderful movement has begun, which can only snowball and overflow to their colleagues.

Debbie's presentation has been projected to reach all the different categories represented at the course. I feel that the discussion groups have been the most worthwhile experience, especially for the Black teachers, who have found these times a very useful experience. Handouts have been clear and easily implemented in the teachers personal lesson preparation.

I have even been able to implement a few of the ideas gleaned at the workshop, into some of my methodology courses run for the teachers!

May TASC go from strength to strength and may many more teachers be introduced to this essential method of educating our children.

G.N. Prinsloo
c/10/7/44

G.N. PRINSLOO
/elr

Curriculum Development Unit
Education Faculty
University of Natal

29.09.1994

Dear

Although the TASC Pilot Project is over I would very much like to keep in contact with you.

I am enclosing a summary of De Bono's Six Thinking Hats as promised. It is a useful way of teaching people how to think in different ways and for different purposes. It is useful for a 'points -of- view' lesson which could be on any subject/problem of interest to the children. It could also be used with colleagues when discussing issues in education!

At this stage I would just like to thank you again for your co-operation during the year. Thankyou for giving me time to observe in your classrooms and to discuss thinking skills with you.

I am enclosing a list of school names and numbers in case you want to keep in contact with each other or if you want to take the networking idea further. I am always willing to facilitate.

As a last request I wonder if you would mind letting me have your final views on the TASC Project. I am enclosing a self-addressed envelope and ask that you would jot down very brief comments reflecting on the workshops you attended. What was the most valuable aspect for you? Have you tried any lessons from the Starter Kit? Now that the course is over will you be able to continue teaching thinking skills? Any comments along these lines will help me in assessing the usefulness of the project and in developing further thinking skills workshops for teachers.

If it would be easier to speak to me rather than write, my number at home is 423403 and at work 2605977. This would be just as useful and probably quicker!

I look forward to hearing from you and hope to keep in contact in the future.

Yours sincerely,

Reflections on the Tasc Workshops and on my own Teaching Practice

DEBBY

I would like to thank you and all others responsible for allowing us the opportunity to participate in the project and thus enriching our teaching skills.

I have found that the pupils and I have become very motivated to implement the lessons from the starter kit. I adapt most lessons to suit my Right Living lessons. The pupils are enthusiastic and respond very well.

I have also given lessons from the starter kit to other teachers both in my school and other schools. I have found that the "English" teachers are more keen once they find it easier to adapt these lessons to their subject.

The technique of group discussion, recording and report back is very exciting. Weaker pupils and shy pupils become confident and learn to express themselves. This helps me to determine where the child has gone wrong or which aspect he/she does not understand.

Thank you

ASU

Reflections on the Tasc Workshops and on my own Teaching Practice

- ① TASC Workshops - primarily helped me to reflect on my teaching and re-define the direction that I was leading my pupils.
- ② The emphasis in my lessons shifted from one of content based to skills.
- ③ The degree of pupil participation increased - scope for reserved pupil - to make his/her contribution - helped to improve his/her self concept - positive impact on his/her personality.
- ④ Teaching became more relevant - pupils learning skills that were preparing them for the future.
- ⑤ Pupil Response - during lessons - very enthusiastic - were very stimulating to me as a teacher. Classroom = "hive of activity". Pupils look forward to lessons - on thinking skills.
- ⑥ As an educator - very enriched after attending the TASC workshops.

Siva?

(You do not need to sign your name. Thank you for responding to this.)

Reflections on the Tasc Workshops and on my own Teaching Practice

This is to acknowledge receipt of your letter of recent date where I was requested to comment on the Tasc Project as a whole.

a) I enjoyed the project very much, and moreover it has helped me to improve my teaching methods.

b) It has given me motivation to study further so as to get more information as far as thinking skills are concerned.

c) It has taught me to teach through playing and my pupils learning by doing.

d) Tasc has introduced me to new friends of different skin of which I'm delighted. We have gone through matches (netball & soccer) with them. Our pupils have met one another, that also improves our kids love of communication.

e) My colleagues were also interested to the project especially when they saw our rewards and the Starter Kit. We would love to have more lessons on the Starter Kit. It is so worthfull.

(You do not need to sign your name. Thank you for responding to this.)

Reflections on the Tasc Workshops and on my own Teaching Practice

I thoroughly enjoyed the injection of new ideas. The need for all these skills to be included in all our teaching is essential.

I have found the mind mapping to be particularly good in S10 4. We are using it in Science, Geography + History (with colour) for learning. We also use it to plan an essay in an exam.

Enclosed is a booklet with some of the skills used in Science - air pollution.

Thank you also for those few lessons done at the beginning of the year. It opened a gateway of new ideas for me and I have enjoyed getting my pupils to learn to "think" this year - even if it's the only thing I've done!

Thank you too for the super book of Tasc ideas supplied. Am sharing it with my colleagues - bit by bit.

(You do not need to sign your name. Thank you for responding to this.)

Enjoyed networking with the teachers from other Departments.

Thank you Debbie.
Marie

Interview with Teacher 3, School E 26/7/94

(O.C. = Observer's/ Interviewer's Comments: Bogdan and Biklen, 1992)

Did you have any opportunity to share with the staff and your colleagues anything about the last TASC workshop?

Yes we did - on the first day - reported back. They were so excited by the skills that we brought - like prioritizing. We just demonstrated what you did to us (OC Modelling). Also the first game with the environment - they are going to write up their own question and answer cards and use it in their classes.

Have you tried any more of the skills in the classroom?

No, not yet. The children were all very late starting (the new term) started on the 5th - but they all came on the 12th (we gave them the 12th - poor attendance. Then busy with stock-taking. But the other skills - like comparison - we did that.

Right from the beginning of the year - what skills have you done with the children?

Brainstorming -

I start with this

I use it nearly every day - I use it to see first what the children know and add on top of that (OC establishing prior knowledge -

scaffolding) and to relate the real situation and the classroom situation (OC relevance).

And comparison - especially in gen. science - we use it very much, classification of vegetables. We compared them.

And how did the children react when you did these skills?

They were very excited - you'll see them just now (Researcher was to observe a T/skills lesson).

How is the group-work approach going?

Eh! They like it, too. Though not so much buck-up in talking. [O.C. limited by language] They do understand that they can get information from others. Some of them play

Can you identify any difficulties with implementing the T/Skills?
Any more problems?

The large number - 5 groups of 9 pupils. But to-day they are not all in - absent because of the weather and the other problem is the language problem. Some of them just fear to utter a word - some are just shy of speaking (even in Zulu) to stand up and say something is very difficult. But some - even us- we are not used to the skills (Teacher's own experiences of schooling). But it will get better with time - we'll get used to it.

Have there been any changes in the children? Have they changed in any way?

Yes - they've changed a lot - now they're trying to speak - there's that risk-taking. They're only used to writing. The teacher does a lot of speaking and they do a lot of writing. Now it has changed - they're trying to speak.

Any signs of transfer? (expanded on this)

With me leading them. But alone I don't think they can do it. We did it in English - and then Zulu. Eg. I gave them 2 groups - nurses/teachers. They could give the reasons - "Why did you choose/prefer this - to become a nurse or teacher?" They could tell me the important points - Why they chose to be a nurse or a teacher.

Have you worked with any other staff for planning?

No - we have never had an official meeting - but we do talk about it when we meet.

How supportive is your Principal?

He is so supportive - He wants us to go (to the workshops) - even if he can't go himself - he wants us to go (to the workshop). He even didn't release children to-day because you were coming. He

gave us your number to get in touch. Even the children told me they saw the car ... they were waiting for you. They'd be disappointed if you didn't come. They were so excited ... etc. (O.C. excited by a change in routine - outside contact ?)