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<td>Helen Breen</td>
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Science Education In Primary Schools
In A
State Of Change

Coral Campbell
B.App.Sc., B.Ed.

Submitted in total fulfilment of the requirements for the degree of
Doctor of Philosophy

Faculty of Education
Deakin University
Geelong, Victoria

February, 2000
I certify that the thesis entitled:

Science Education In Primary Schools In A State Of Change

submitted for the degree of:

Doctor of Philosophy

is the result of my own research, except where otherwise acknowledged, and that this thesis in whole or in part has not been submitted for an award, including a higher degree, to any other university or institution.

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Coral Joyce Luck CAMPBELL

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25/7/2013
# TABLE OF CONTENTS

**Science Education in Primary Schools in a State of Change**  
Candidate's certificate  
Contents  
Abbreviations  
Acknowledgements  
Preamble  
Summary  

Chapter One - Education in a State of Change  

1.1 Introduction - A Glance at the International scene  
1.2 Macro Visions of International Education  
1.3 National Education  
1.4 The Self-managing School  
1.5 Changing the 'state' of State education  

Chapter Two - A State of Policy and Structural Change  

2.1 Introduction  
2.2 Schools of the Future (SOF)  
  2.2.1 The Quality Provision Framework  
  2.2.2 School Charters  
  2.2.3 School Global Budgets  
  2.2.4 District Structure  
  2.2.5 School-based Personnel Responsibilities  
  2.2.6 Broad Policy Framework  
  2.2.7 School Councils  
  2.2.8 Report on the Schools of the Future Program  
2.3 Schools of the Third Millennium (SOTM)
2.4 Curriculum and Standards Frameworks (CSF) . . . 37
   2.4.1 Reaction to the CSF . . . 38
   2.4.2 Accountability . . . 40
2.5 Learning Assessment Project (LAP) . . . 42
   2.5.1 Reactions to the Introduction of the LAP . . . 43
   2.5.2 LAP Implementation . . . 44
2.6 Staffing - post 1992 . . . 46
2.7 Professional Recognition Program . . . 50
2.8 The Change to Teaching Practice . . . 54
   2.8.1 The Crowded Curriculum . . . 54
   2.8.2 Assessment & Reporting . . . 56
   2.8.3 Classroom Numbers . . . 57
   2.8.4 Teachers' Practical Response to Changes . . . 58
2.9 Issues and Research Questions Arising . . . 59

Chapter Three - Science Education in a State of Change . . . 61

3.1 Recent History . . . 61
   3.1.1 Process Science Theories . . . 61
3.2 Primary School Science . . . 63
   3.2.1 Course Content . . . 63
   3.2.2 Teacher Training . . . 67
3.3 Constructivism . . . 68
   3.3.1 Personal Constructs . . . 68
   3.3.2 Children's Science . . . 70
   3.3.3 Social and Linguistic Factors . . . 70
   3.3.4 Constructivism - the practical application . . . 72
3.4 Refining the Research Questions . . . 74
Chapter Four - Methodology for a Science Education in a State of Change

4.1 Introduction ................................................................. 75
4.2 Changing My Views ....................................................... 76
4.3 Selection of the Methodologies of this Study .......................... 78
  4.3.1 Beginning of Researcher’s Story ................................ 78
  4.3.2 Case Study ............................................................. 80
  4.3.3 Action Research as Critical Self-reflection ....................... 82
4.4 Methods ......................................................................... 84
  4.4.1 Observation .............................................................. 85
  4.4.2 Interviews ............................................................... 85
  4.4.3 Questionnaires ........................................................ 86
  4.4.4 Diary Writing and Journal Writing ................................. 87
  4.4.5 Triangulation ........................................................... 88
4.5 Conclusion ....................................................................... 89

Chapter Five - A Primary School in a State of Change ................. 90

5.1 Historical context of Maxwell Primary School ....................... 90
5.2 Staffing and staffing changes ............................................. 92
5.3 A cross-check; effects of changes at another school ................. 95
5.4 Stories from the Field - Amidst the Changes ......................... 96
  5.4.1 Roxanne’s Story ....................................................... 96
  5.4.2 Marlon’s Story ........................................................ 99
  5.4.3 Leanne’s Story ........................................................ 101

Chapter Six - A Science Classroom in a State of Change: Action research study of my science teaching practice ................. 106

6.1 The Researcher’s story .................................................... 106
  6.1.1 The Initial Years ....................................................... 107
6.1.2 Reality Strikes. 109
6.1.3 My Need for Self-Improvement 110

6.2 The Start of Change 111
   6.2.1 New Principal, New Start? 113
   6.2.2 Classroom Teaching 115
   6.2.3 Support versus Lack of Support 116
   6.2.4 The Constraints of Personal Life 119
   6.2.5 Another New Start 121
   6.2.6 The Impact of School Change. 122
   6.2.7 The Action Research Project - 'Buddy' Science 124

6.3 Getting Started 126
   6.3.1 The Buddy Science Program 127
   6.3.2 Constructivism Revisited 128
   6.3.3 Supporting Teachers 129

6.4 Science Practical Sessions 131
   Example 1 - Buddy Science Practical - Collections 132
   Example 2 - Buddy Science Practical Noting changes to
       Natural Things 6/03/98 134
   6.4.1 Buddy Science Practical - Materials -How things
       Change 1/04/98 137
   6.4.2 Buddy Science Practical - Electricity 30/04/98
       & 7/05/98 139
   6.4.3 Buddy Science Practical - Planting Pansies 14/05/98 141
   6.4.4 Buddy Science Practical - Battery Power 4/06/98 144
   6.4.5 Buddy Science Practical - Magnets & Magnetism
       11/06/98 145
   6.4.6 Buddy Science Practical - Light 16/07/98 147
   6.4.7 Buddy Science Practical - Sound 23/07/98 149
   6.4.8 Buddy Science Practical - The Weather 6/08/98 151
   6.4.9 Buddy Science Practical - Day & Night 3/09/98 153
   6.4.10 Buddy Science Practical - Colour 16/10/98 155
   6.4.11 Buddy Science Practical - Snails 5/11/98 156
6.4.12 Buddy Science Practical - Senses 19/11/98 . . . . 157
6.4.13 Buddy Science Practical - Fossils 15/11/98 . . . . 159
6.5 Issues arising during the Action Research . . . . . 161

Chapter Seven - Effects and Impacts of Structural and Policy Changes . . . . . 163

7.1 Preamble: Recapitulation of Structural and Policy Changes . . . . . 163
7.2 Increased Workload in the Professional Context . . . . . 170
  7.2.1 Fewer teachers and larger classes . . . . . 176
  7.2.2 Lack of Preparation Time . . . . . 181
  7.2.3 Accountability Demands . . . . . 183
  7.2.4 Professional Development . . . . . 188
7.3 Changed Power Relations in the Professional Context . . . . . 192
  7.3.1 Changed Relationships among Schools . . . . . 194
  7.3.2 Central Bureaucracy: Principal: Schools . . . . . 197
  7.3.3 Changes in the Culture of Schools . . . . . 200
7.4 Changes in Curriculum and Teaching Role in the Professional Context . . . . . 206
  7.4.1 Changes in Curriculum . . . . . 206
  7.4.2 Changes in Teachers' Role . . . . . 210
7.5 Changed Security/Morale in the Professional Context . . . . . 215
  7.5.1 Impact of CSF and other Workload Factors . . . . . 216
  7.5.2 Teachers' Career Structure - Professional Recognition Program . . . . . 220
  7.5.3 Increased Casuvalisation of the Workplace . . . . . 223
7.6 Coping with the 'Big Picture' Rolling Changes . . . . . 226

Chapter Eight - Specific Issues for Science Teaching . . . . . 229

8.1 Role of Contemporary Education Theory in Victorian Science Classrooms . . . . . 229
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.2</td>
<td>Effect of Contextual Changes on Science Teaching Practice</td>
<td>231</td>
</tr>
<tr>
<td>8.2.1</td>
<td>Importance of Science Education</td>
<td>232</td>
</tr>
<tr>
<td>8.2.2</td>
<td>Workload</td>
<td>234</td>
</tr>
<tr>
<td>8.3</td>
<td>Professional Development and Workload</td>
<td>235</td>
</tr>
<tr>
<td>8.4</td>
<td>Changes in Role: specialist versus classroom teacher</td>
<td>237</td>
</tr>
<tr>
<td>8.5</td>
<td>Rate of Change: Morale/Workload Issues</td>
<td>241</td>
</tr>
<tr>
<td>8.6</td>
<td>Budgetary Constraints</td>
<td>243</td>
</tr>
<tr>
<td>8.7</td>
<td>Effect of Contextual Changes on Reflective Teaching Practice</td>
<td>248</td>
</tr>
<tr>
<td>8.8</td>
<td>Concluding Comments</td>
<td>257</td>
</tr>
</tbody>
</table>

**Chapter Nine - Outcomes of the Research and Their Contemporary Significance**

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.1</td>
<td>Reviewing the Researcher's Story</td>
<td>260</td>
</tr>
<tr>
<td>9.2</td>
<td>Outcomes of the Research</td>
<td>262</td>
</tr>
<tr>
<td>9.2.1</td>
<td>The Thesis Outlined</td>
<td>262</td>
</tr>
<tr>
<td>9.2.2</td>
<td>Critical Self Reflection</td>
<td>264</td>
</tr>
<tr>
<td>9.2.3</td>
<td>The Kennett Era</td>
<td>266</td>
</tr>
<tr>
<td>9.2.4</td>
<td>Limitations of this Research</td>
<td>267</td>
</tr>
<tr>
<td>9.3</td>
<td>Contemporary Significance of these Outcomes</td>
<td>267</td>
</tr>
<tr>
<td>9.3.1</td>
<td>What is the Contemporary Significance of these Outcomes?</td>
<td>267</td>
</tr>
<tr>
<td>9.3.2</td>
<td>Proposed Recommendations</td>
<td>269</td>
</tr>
<tr>
<td>9.3.3</td>
<td>Future Areas of Investigation</td>
<td>270</td>
</tr>
<tr>
<td>9.3.4</td>
<td>Concluding Comments</td>
<td>271</td>
</tr>
</tbody>
</table>

**Appendix: Collection of Science Experiments undertaken as part of the Action Research Project**

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bibliography</td>
<td></td>
<td>284</td>
</tr>
</tbody>
</table>
### ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
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</tr>
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<tbody>
<tr>
<td>ACTU</td>
<td>Australian Council of Trade Unions</td>
</tr>
<tr>
<td>AIRC</td>
<td>Australian Industrial Relations Commission</td>
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<tr>
<td>AST</td>
<td>Advanced Skills Teacher</td>
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<tr>
<td>BoS</td>
<td>Board of Studies</td>
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<tr>
<td>CASES</td>
<td>Computerised Administrative Systems Environment for Schools</td>
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<tr>
<td>CSF</td>
<td>Curriculum and Standards Framework</td>
</tr>
<tr>
<td>DEET</td>
<td>Department of Education, Employment and Training</td>
</tr>
<tr>
<td>DoE</td>
<td>Department of Education</td>
</tr>
<tr>
<td>DSE</td>
<td>Directorate of School Education</td>
</tr>
<tr>
<td>DLP</td>
<td>District Liaison Principal</td>
</tr>
<tr>
<td>ERASP</td>
<td>Effective Resource Allocation in Schools Project</td>
</tr>
<tr>
<td>FTUV</td>
<td>Federated Teachers Union of Victoria</td>
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<tr>
<td>KLA</td>
<td>Key Learning Area</td>
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<td>LAP</td>
<td>Learning Assessment Project</td>
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<td>LEA</td>
<td>Local Education Authorities (Britain)</td>
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<tr>
<td>LOTE</td>
<td>Languages Other Than English</td>
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<tr>
<td>MAVRIC</td>
<td>Mathematics Association of Victoria</td>
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<tr>
<td>PD</td>
<td>Professional Development</td>
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<tr>
<td>PEEL</td>
<td>Project to Enhance Effective Learning</td>
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<td>PRP</td>
<td>Professional Recognition Program</td>
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<td>SIU</td>
<td>Social Integration Unit</td>
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<td>SRP</td>
<td>Senior Responsibility Position</td>
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<td>SOF</td>
<td>Schools of the Future</td>
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<td>Schools of the Third Millennium</td>
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<td>VASSP</td>
<td>Victorian Association of State Secondary Principals</td>
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<tr>
<td>VCE</td>
<td>Victorian Certificate of Education</td>
</tr>
<tr>
<td>VPPA</td>
<td>Victorian Primary Principals Association</td>
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<tr>
<td>VSTA</td>
<td>Victorian Secondary Teachers Association</td>
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ACKNOWLEDGEMENTS

Many people have contributed to the information interwoven into this thesis. I would like to acknowledge all those who contributed. Firstly, I would like to thank the research participants, who for reasons of confidentiality, cannot be named. Each person willingly participated and gave freely of their time. Without their support, this story would never have been written and a period of change in the educational field would have remained undocumented.

Next, I would like to thank my primary supervisor, Associate Professor Ian Robottom. Ian has been extremely supportive of all my efforts. Even from the very start, he upheld my application to join the Masters program and was instrumental in me gaining a place. From the times when I have been least productive, through to the more verbose applications of my thoughts, Ian has been a source of support and understanding. I am extremely grateful for his advice and, in particular, his unflagging conviction that one day I would be finished.

My associate supervisors, Dr. Peter Ferguson and Dr. Beverley Jane, have also given of their time, offering advice and support. In particular, it was reassuring that others could see the direction I was taking with my studies and could continue to support me. Part way through my thesis, Dr. Ferguson left the university and I am grateful that Dr. Jane agreed to take his place.

Finally, I would like to thank my family for putting up with my continual study for the last seven years. School holidays tended to see me buried in the study and not always available to their needs. However, my husband Bill is the person I am most indebted to. From the very start, he encouraged me to take up the challenge of extra study and has been an unwavering source of comfort and strength when I have felt less than adequate to the task. Even through his illness, Bill never allowed me to weaken and it is through his love and support that I was finally able to complete this thesis. Thank you, Bill.
PREAMBLE

I have heard many people describe their thesis as a journey. For me it has been an incredible voyage of development across a six year time span. My understandings of research, of education and indeed of myself, have shaped, and have been shaped by, the events of the last six years.

When I commenced this research, I had some understandings of naturalistic research but wanted to follow the ingrained ways of my empiricist background. Keeping in my comfort zone, I wanted to undertake statistical studies in an ethnographic situation. Fortunately, my supervisor guided me through the literature in an effort to expand my understandings of different research methodologies and approaches. Chapter Four explains this part of my voyage.

As part of the background to my research project into science education, I needed to document some of the structural and policy changes that were occurring in schools. This documentation turned out to be an immense, ongoing task, but one which was necessary to set the context of my research. The main changes being implemented in education throughout the world, and specifically in Victorian education, are explained in the first two chapters of this thesis. In studying these changes more closely, certain issues continue to emerge which are related to the impact of these changes on the everyday life of a primary classroom teacher. These issues have been drawn out and highlighted throughout the second chapter of the thesis, and then have then been taken up again in Chapter Seven.

I found that I needed to develop a better understanding of where science education had come from in order to fully explicate how, and why, I wanted to make changes in my science teaching practice. This required looking at the recent history of science education and some of the philosophies behind certain approaches. This historical account is presented in Chapter Three.
To set the scene within my school, Chapter Five is a description of the school, the staff and the interplay between myself and certain groups within the school environment. Using a case study approach, I have documented how other schools have dealt with change, and also how other teachers have reacted to the situation of change in their own teaching practice. This description focussed down in Chapter Six, to include a study of my own science teaching practice. Initially in this chapter, I have discussed the lead up to the action research project that I attempted in 1998. Further into this chapter, the actual action research project has been described in detail, with lesson plans being included in the Appendices. Again, issues arose from the conduct of the action research project and Chapter Eight contains a detailed discussion of these issues.

Chapter Seven picks up on the issues that were raised earlier in the thesis in Chapter Two. These issues have assumed greater importance because of the effect they have on the daily lives of all teachers. These issues which directly impacted on my ability to be critically self-reflective are discussed with reference to supporting literature and the ‘lived experiences’ of teachers from around Victoria.

Chapter Eight has followed the thread of these changes and includes a study of the situation with reference to science education and specifically my science teaching practice. The negative impacts of the changes have been explored and indicate why the action research project did not succeed as planned, despite all good intentions. This lack of success in turn has raised further dilemmas and questions about the feasibility of teachers undertaking reflective practice in the climate of change currently existing in schools.

Chapter Nine further examines these questions and the whole purpose of the thesis is revisited. No longer is the thesis limited to an individual’s action research project set in the context of an individual school. Rather, the thesis has become a record of the changes that occurred in the wider school environment (case study) and the action research has become a reflection on the ability of a teacher to undertake critical self-reflection - in a sense a kind of meta action research. This chapter indicates the
possibilities available to individual teachers who want to improve their teaching practice and offers some recommendations for a way forward.

Snapshots from experience.

Below are some excerpts from my journal. No additional comments are made as I believe that they are self-explanatory and illustrate some of the points to be discussed throughout the thesis.

It is interesting to note the pattern that has emerged at this school over the last five years. In 1992, I was a full-time science/PE specialist. In 1993, although I was still the science/PE specialist, I was required to act as a CRT (casual replacement teacher) in classrooms if other staff were absent. Note: the other OE (over-establishment) teacher, art/library was not required to do this. After the first absence, replacement staff were hired. Basically this is to ensure that staff receive some preparation time, but it also indicates which specialist area is held as most important. Comment: Jill (the art/library teacher) refuses to be flexible about this, so I must be or create ill-feeling. When a staff member went on long service leave, I was required to take on part-time classroom duties for a term. In 1995, by dint of numbers, staffing restrictions and lack of funds, I was required to teach in a grade. I managed to take science in four grades each week by swapping in/out with class teachers. This was difficult without any preparation time. In 1996, after an appeal to school council for funds, I was awarded sufficient funds for a CRT to release me from class one day per week. Despite this allowance, the principal decided to only allow release time of 2 1/2 hours per week. The funds were spent elsewhere.

Journal entry, 21 March 1997

At a meeting with Mal Bost (school financial advisor), we had to severely cut our budgets once again. Science is now running at about $450 (reduced from $1500), and the CRT component has been cut totally. Part of the reason for this is that our numbers have not increased to 210 for 1998 and remain at 195....JM has approached me several times about taking science in her grade, but I'm less than enthusiastic with the idea of trying to take science outside my grade with
little or no support. I am tired of trying to push science onto other teachers. I am tired of the demands made on my time of all the peripheral things. At the moment, I don’t feel like taking on anything but basic teaching duties next year.

Journal entry, 1 December 1997.

Tonight was a school council meeting. When presenting the minutes from the Curriculum Subcommittee, it was noticed by me that the area of science had been overlooked. No mention made of the 1995 policy, or if they believed it didn’t exist, to the fact that it needed writing up. I was amazed that a whole KLA area should have been overlooked. Perhaps I shouldn’t be surprised, its fairly obvious that science is a low priority for most staff.

Journal entry, 19 May 1998

Tristan (an ex pupil) dropped into school today and was complaining about his science teacher. He commented that she wouldn’t allow any of the students to touch or ‘muck around’ with any of the science equipment. When I asked Tristan why this was a problem, he commented that most of the others at school were really excited about science because they hadn’t done it in primary school (like he had).

Journal entry, 20 August 1998

SIGNIFICANCE OF THE STUDY

The significance of this study is discussed fully in Chapter Nine. Looking at the result of this study retrospectively, I comment on how the Kennett government came into power in late 1992, just before I commenced my study in early 1993. My study concluded towards the end of 1999, just as the Kennett government lost its position as the state government in Victoria. The changes introduced to schools over this period can be attributed to the policies introduced by the Kennett government.

As I am concluding my writing, the Department of Education has at last recognised the importance of science education and is placing huge sums of money into various enterprises to improve the level of science education in this state. This document
highlights some of the problems faced by teachers trying to improve their science teaching practice.

A practical list of recommendations are generated in the conclusion of this study which may offer some direction for the improvement of teaching, in particular, in the area of science education using critical self-reflection.
SUMMARY

Through a longitudinal study of one teacher's science teaching practice set in the context of her base school, this thesis records the effects of the structural and policy changes that have occurred in Victorian education over the past 6-7 years - the ‘Kennett era’. Initially, the purpose of the study was to investigate the teacher’s practice with the view to improving it. For this, an action research approach was adopted. Across the year 1998, the teacher undertook an innovative science program with two grades, documenting the approach and outcomes. Several other teachers were involved in the project and their personal observations and comments were to form part of the data.

This research project was set in the context of a single primary school and case study methodology was used to document the broader situational and daily influences which affected the teacher’s practice. It was apparent soon after starting the action research that there were factors which did not allow for the development of the project along the intended lines. By the end of the project, the teacher felt that the action research had been distorted - specifically there had been no opportunity for critical reflection. The collaborative nature of the project did not seem to work. The teacher started to wonder just what had gone wrong. It was only after a break from the school environment that the teacher-researcher had the opportunity to really reflect on what had been happening in her teaching practice. This reflection took into account the huge amount of data generated from the context of the school but essentially reflected on the massive number of changes that were occurring in all schools. Several issues began to emerge which directly affected teaching practice and determined whether teachers had the opportunity to be self-reflective. These issues were identified as changes in curriculum and the teaching role, increased workload, changed power relations and changed security/morale on the professional context.

This thesis investigates the structural and policy changes occurring in Victorian education by reference to documentation and the lived experiences of teachers. It studies how the emerging issues affect the practices of teachers, particularly the teacher-researcher. The case study has now evolved to take in the broader context of the policy and structural changes whilst the action research has expanded to look at the
ability of a teacher to be self-reflective: a meta-action research perspective. In concluding, the teacher-researcher reflects on the significance of the research in light of the recent change in state government and the increased government importance placed on science education in the primary context.
CHAPTER ONE

EDUCATION IN A STATE OF CHANGE

This chapter will set the scene of the structural and policy changes which have occurred in education over the past twenty years, but particularly over the last few years. While the thesis addresses change in Victorian Education, it has to take a ‘fix’ at some stage - the time of completing the writing of this document, late 1999. Initially it will touch on the observed changes at the international level, in countries such as England, United States of America and New Zealand, and then will focus on some of the Australian initiatives. Changes at the State level are discussed in detail in Chapter Two as this document progressively focusses on the changes at international, national, state, school and classroom levels. In parallel, the same technique of progressive focussing will be used to study science education from international to classroom levels. In doing this, I will be adapting the methodologies of document (policy) analysis, case study and action research.

1.1 INTRODUCTION - A GLANCE AT THE INTERNATIONAL SCENE

Change is not necessarily improvement...change may or may not be progress.

(Cuban, 1990, p72)

Throughout the western world there have been sweeping changes in the way governments view themselves and to their task of governing. In England, in the mid-1970s, the Conservatives headed by Margaret Thatcher developed a program of change influenced by the radical ideas of the New Right. The New Right is not a unified movement or group. Rather, it is a doctrine of thought which seeks to redefine the relationship between the state and the economy (Gamble, 1989). The New Right believes that market enterprise and the ‘free market’ is superior to any other form of political or administrative co-ordination (Gamble, 1989). This is the underlying philosophy behind privatisation. The Thatcher government saw privatisation as the ‘withdrawal from direct state involvement in the provision of goods and services’
(Gamble, 1989). In England, privatisation threatened to dismantle the public institutions of health, education, housing, social security and communal care - all of which had traditionally come under state authority. The Thatcher government wanted a strengthening of ‘traditional’ values, but many of its policies were leading to decentralisation of control and a loss of these values (Gamble, 1989). The Government has been able to develop an authoritarian control for many of its new measures. It has devolved some authority, but retained central control.

In the United States of America (USA), a similar story of change has been unfolding. Named by Osborne and Gaebler (1992, pxix) as the ‘entrepreneurial government’, the change has been defined as a shift of economic resources out of an area of low productivity to an area of higher productivity and greater yield. To do this the government:

...works with the private sector. It employs solid business sense. It privatizes. It creates enterprises and revenue generating operations. It is market oriented. It focuses on performance measurement. It rewards merit.  

(Osborne & Gaebler, 1992, p18)

Believing the bureaucratic government had grown so large that it was no longer able to act in an efficient way, state governments started to seek alternative ways to deliver services (Osborne & Gaebler, 1992, p16). They fostered competition between service providers and focussed on ‘doing more with less’.

New Zealand has also been following the philosophies of the New Right. The policy document ‘Government Management Volume Two: Education Issues’ is described by Middleton, Codd and Jones (1990) as epitomising ‘the ideas of the world-wide political and economic movement commonly referred to as the New Right’. During the 1980s there was a distinct shift in government policy towards free market beliefs and enterprises - a monetarist position (Codd, 1990, p134). Along with free market economic policies, the New Zealand government has pursued policies of affirmative action to redress the problems to those disadvantaged by the competitive individualism of the free market.
1.2 MACRO VISIONS OF INTERNATIONAL EDUCATION

In all the countries mentioned so far, there has been a flow on from overarching government policies to, more specifically, the reform of education. England initially introduced a system of Assisted Places which enabled a more academically-able child to select an education from the private sector. This was supposed to spur the poorer state schools into improving what they offered their students. Effectively, as the private schools were able to increase their ‘clientele’, so they continued to flourish. However, the very legitimacy of the state school was being questioned with the government’s support of private education through the Assisted Places scheme. In addition, the government wanted to reduce the powers of the Local Education Authorities (LEAs). By increasing the rights of parents in the choice of their child’s school and by increasing the powers of the school governing body, the LEAs powers were diminished. In a further development in 1986, independent schools were set up. These were partially funded by recurrent government grants but also financed by industrial sponsors.

Finally, in the 1988 Education Reform Act, schools were given the authority to opt out of LEA control and were maintained by a centrally-funded grant system (Whitty, & Mentor, 1989, p47). The outcome was that only schools which continued to compete successfully for individual clients would be rewarded. Poorly resourced schools which did not, or could not, compete would be put ‘out of business’. Whitty and Mentor (1989, p48) commented that these poorer schools could become ‘institutions of social control’ where the primary concern would be social welfare rather than education.

Further reviews of the English system have shown that by 1997 only about 4% of government schools had become grant-maintained schools despite repeated inducements by government (Graham, 1998). The response of these schools to their self-managing status has been noted:

- Resources - increased administration diverted resources away from classroom learning needs;
- Teacher - increased workload, less involvement in decision-making, increase in administrative positions rather than teaching positions, increase in hierarchical organisation. Teachers are isolated from the
broader professional community due to heightened competition between schools;

- Parents - less involvement than in non grant-maintained schools except in a financial capacity and less communication from school. Board was comprised of parents with managing and marketing backgrounds;

- Equity - Most grant-maintained schools were established in the middle-class areas. They were noted to be academically selective and often single-gender schools. Students needing extra assistance (e.g., with disabilities or learning difficulties) were discouraged from enrolling; and

- Educational Achievement - no evidence to support the contention that self-governance improved student performance.

In the USA, where the dominant paradigm is that of the free market model, devolution to the school council has occurred. The school council has the responsibility of hiring or firing the principal, preparing a school improvement plan and preparing the school budget in line with the plan. The school council usually consists of eight community members and three school staff (including the principal). Many schools have moved towards giving students a choice about which school they attended.

As John Chubb stated:

> You need a system that holds schools accountable not from the top down, but through the market process, through the competitive process... A system of competition and choice... automatically provides the incentives for the schools to do what is right.  
>  
> (Osborne & Gaebler, 1992, p95)

In 1991 the first Charter legislation was introduced in Minnesota (Graham, 1998). The US Federal Government provides funding for ‘Charter schools’, but each state has to address its own requirements for the schools. Charter schools are autonomous schools which, although publicly funded, are not under the direct administrative control of the government. By 1998, thirty-three other states had authorised Charter schools. Several indications of the impact of these changes are mentioned:

- Public systems are undermined by the transfer of funds to Charter schools;
- Inequity in funding in some states where Charter schools receive more of the ‘public purse’ than public schools;
• Student selective processes occur so that Charter schools accept only the more able students. Children with special needs attend the regular public schools. Student populations at charter schools are predominately white where parents have above average salaries;
• Parental involvement - ‘voluntary’ fees become obligatory, and parent involvement contracts are common;
• Teachers are often uncertified and paid below-average salaries (A$30000 c.f. A$65000);
• Smaller class sizes are achieved at the expense of reduced salaries;
• Longer school hours, longer school year and increased workload for all staff; and
• Student achievement is not noticeably improved by attendance at a charter school.

(Graham, 1998)

New Zealand schooling has also changed. Codd, Harker and Nash (1990, p8) stated that the economic and social restructuring of education was a direct result of ‘the politics of profit’. Accountability became a huge issue (Codd, 1990, p142) and education was viewed as a commodity to be subject to free market trade. In a Treasury document the following excerpts were noted:

...formal education is unavoidably part of the market economy and the Government can afford to be no less concerned with the effectiveness and ‘profitability’ of its expenditure on education, in relation to the state’s aims, than private providers would be in relation to their own.


From the 1970s when schools were assessed on ‘inputs’ (such as the expenditure per student) there was a swing to assessing the ‘outputs’ such as the performance of students in standardised tests. The Treasury document was also concerned with the measurement of ‘outputs’:

State intervention to realise the social benefits may be achieved by setting minimum output standards in the three R’s and other core areas... This would leave the school committee or equivalent free to determine how the minimum output standard would be achieved.


New Zealand’s newest educational scheme is that of ‘Tomorrow’s Schools’. Introduced in 1989, this scheme required that each school be governed by a small board
of trustees elected by parents. The board has the responsibility of managing the school within the terms of the school ‘Charter’, the hiring of staff and over discretionary expenditure. The school boards are subject to dismissal and the Ministry of Education retains its responsibility for policy development and control of the teaching profession.

In 1997, a report was compiled by Cathy Wylie (1997) as one of a series, which looked at how New Zealand’s Tomorrow’s Schools were managing and their impact on education in New Zealand. In the latest report, she is able to comment about observable trends in a number of important areas:

- Resources - most principals felt that levels of funding had diminished and schools had to increase their fundraising and parental donations. Finance and property were the issues which dominated the time of the boards of governance. Funding for staff was inadequate, and teacher turnover was high. Workloads were very high.
- Partnership - generally the partnerships between teachers, principals and school boards were viewed in a positive way;
- Improved learning - whilst the majority of principals felt that learning had improved, the majority of teachers did not support that view;
- Disadvantaged students - there was no growth in programs or policies to support disadvantaged groups; and
- Parental satisfaction - satisfaction was high except for the issue of class size where about half of all parents expressed dissatisfaction with the size of their child’s class.

The world wide trend has therefore been to dismantle the traditionally centralised education systems. They are being replaced with a ‘self managing’ concept which is based on the free market ideology of competition and ‘choice’. The self managing school allegedly offers:

- more democratic community involvement;
- more parental choice;
- a better managed school; and
- a more effective school.

(Smyth, 1993, p3)

However, the reality that is apparently being experienced already in some countries is:

- schools are pitted against one another for resources and students;
• teachers are rewarded according to what they produce; and
• students are assessed against nationally determined yardsticks.
   (Codd, 1993, p3)

Jill Blackmore (1994) surmises that these countries had different reasons for
decentralisation and devolution. She also believes that devolution is a ‘highly political
form of educational governance’ which has the ‘potential to produce equity or inequity’
depending on the form it takes. She continues with the following statement:

...devolution has also been used ideologically to worsen teachers’
work conditions, reduce the size of the teacher workforce, undermine
unionism and reduce public sector spending in the USA, UK,
Scotland, Sweden, Canada, Australia, Mexico and New Zealand.
   (Blackmore, 1994, p147)

1.3 NATIONAL EDUCATION

In Australia, education has historically been a state responsibility. Until the early 1970s
public education was administered through highly centralised state government
departments. Curriculum was generally determined by this central body with control
exerted through a system of inspectors and state-wide external examinations. The
federal government provided very little support. Then in the 1970s, the federal
government established the Australian Schools Commission which administered a
comprehensive grants scheme. The scheme was designed to redress disadvantage and
achieve greater equity amongst schools. As the task for administration became more
complex, several states decentralised to the school level some of the decisions relating
to the grants. Further to this, some states set up regional units and in yet further
reforms, school councils or boards were set up which had advisory and decision-making
powers. As the Australian Labor Party came into power in the early 1980s it instigated
several changes with ‘substantial commitment to decentralisation’ (Caldwell & Spinks,
1988, p13).

In Victoria, the government commissioned a study which resulted in a series of
Ministerial Papers. These papers had devolution of authority and responsibility,
collaborative decision making, responsive bureaucracy, effectiveness of outcomes and
redress of disadvantage as their guiding principles. Other priorities included the School Improvement Plan and Program Budgeting in schools. In 1986, the Victorian government tried to introduce the ‘self governing’ school. These schools would be fully funded by the state but would be governed by their school councils. This was opposed by schools and the community in general. However, devolution was now part of the education structure in Victoria:

Around Australia, in system after system, we have seen a decade long paring down of the big central bureaucracies with the educator staff reassigned to Regions, to clusters, to Education Resource Centres and to schools or given disengagement packages. (Beare, 1995, p12)

Professor Beare, in his address at the 1995 Currie Lecture, commented on the development of devolution around Australia. There are now considerably fewer staff in the educational bureaucracy, few administrators, fewer consultants, fewer support personnel. He adds ‘...the services which schools (independent as well as government) have taken for granted for many years no longer exist - and certainly not as government-provided or government funded services.’ (Beare, 1995, p12)

In Australia, as a consequence of devolution, schools have to purchase services from private contractors which were once provided by the government. Schools are able to earn additional revenue by selling the skills of their staff, by providing learning materials generated at the school and by providing advice or professional training. In the 1990s, schools have become part of the ‘education market’, where the school is seen as part of private enterprise and education policies are formulated with that as the basic premise (Beare, 1995, p13).

What has emerged throughout Australia, are various models based on what is known worldwide as the ‘self-managing’ school. Beare (1995, p14) contends that ‘By the mid-1990s, what we once knew as the typical Education Department with its hierarchy of controls, has largely gone’. He indicates that it has been replaced by a network of semiautonomous schools which are under contract to deliver an educational service of a
required quality'. He also uses the term self-managing to describe the model of schools which are being developed around Australia.

1.4 THE SELF-MANAGING SCHOOL

In their book, The Self-Managing School, Brian Caldwell and Jim Spinks (1988, pvi) define the self-managing school in the following way:

...as one for which there has been a significant and consistent delegation to the school level of authority to make decisions related to the allocation of resources (knowledge, technology, power, material, people, time and finance).

(Caldwell & Spinks 1988, pvi)

Their definition is based on their study of several Australian schools which were undergoing change along the lines of devolution and decentralisation in the mid-1980s. Funded by the Commonwealth Schools Commission, the initial study was named the Effective Resource Allocation in Schools Project (ERASP). The studies were carried out in Tasmania and South Australia with assistance from a wide range of government educational departments. The decentralisation to schools is essentially administrative. School level decisions are made within a framework of local, state and national guidelines. Schools are accountable to a central authority for the way in which their resources are used. The intention has been to give schools a greater involvement in many of the decisions relating to finance, curriculum and allocation of resources. Self-managing schools are proposed to have a very high level of autonomy.

Caldwell and Spinks (1988) support self-management for schools on a number of grounds. The first of these relates to decentralised budgets which they advocate allow schools to match services to students' needs. Placing funding where it can be best used should promote equality, efficiency and choice by allowing the school to use resources efficiently for maximum benefit. Another point suggested was that a mix of centralised and decentralised control mechanisms could best support the various structures within education. Support services for schools, which can be developed along the lines of
routine procedures, can best be undertaken by centralised control. Alternatively, to cope with the diverse needs of individual students, decentralised control is more efficient. Overall, centralised control is best for the determination of broad goals and purposes, but decentralised decision-making is needed for organising the way in which these goals and purposes will be achieved.

School effectiveness was another argument offered by Caldwell and Spinks for schools to become self-managing. They cite research into teacher effectiveness, school organisation, workplaces other than education and consistency between research and teachers’ experience. Recommendations were offered by Purkey and Smith (in Caldwell & Spinks, 1988, p8) for effectiveness in schools: school should be the focus of change, the focus must be on the individual school culture, resources must be provided to change both people and structures in schools and local responsibility for school improvement must be maximised. Following on from the discussion on school effectiveness, is the area of teacher professionalism. Reducing bureaucratic control and increasing the autonomy of teachers has been reported as enhancing the professionalism of teachers.

The self-managing school as defined by Caldwell and Spinks has many of the features we see operating now in Australian schools and in those overseas. The following positive characteristics were noted as belonging to collaborative school management in a self-managing school:

- it integrates goal-setting, planning, budgeting, implementing and evaluating;
- it secures appropriate involvement of staff, students and the community, with clearly defined roles for governing bodies where such groups exist and have responsibility for policy-making; and
- it focuses on the central functions of schools - learning and teaching. (Caldwell & Spinks, 1988, p3)

In reality, the devolution of power has not followed the path suggested by Caldwell and Spinks, although to an outsider it might appear to have done so. The central bodies of power have retained control over the curriculum by specifying the outcomes of learning
so tightly that there is no allowance for school-based decisions regarding curriculum. Although devolution has occurred to some extent, Smyth (1993, p2) comments,

...the rhetoric of devolution is occurring in contexts in which there have been substantial thrusts towards recentralisation of education.

Angus (in Smyth, 1993, p15) argues that there has been a ‘simultaneous shift in the direction of decentralisation for some kinds of decisions and centralisation for others’. What has actually been devolved to schools is responsibility for a range of management tasks and control of the budget:

Local decisions about the best and most appropriate form of educational delivery and policy, or about the nature and purpose of schooling, are secondary to, and need to be subordinate to, budget considerations.

(Angus, 1993, p17)

Advocates of the self-managing school talk about the resourcing of schools to allow for individual choice. The reality is that throughout the world educational budgets have been severely cut. Smyth (1993) states that sliding profits in the corporate sector of capitalist countries can only be restored if there are massive cuts to public sector spending. This results in ‘a dramatic shrinking of educational budgets’ (Smyth, 1993, p6). Schools’ budgets are inadequately financed. The resources to fund additional programs cannot be found from within the school’s global budgets and parents are being asked to raise ever increasing amounts of money to fund items which were once covered by the Department of Education. In addition to this, schools are relying on the voluntary levy to supply many of the daily necessities. Robertson describes the situation:

...schools have been given little more than an opportunity to ‘manage’ a dwindling set of fiscal resources within a context that has become increasingly typified by tightening centralist controls over policy, curriculum reform and content, evaluation and standards.

(Robertson, 1993, p132)
The notion of autonomy and increased professionalism for teachers can also be questioned. Whereas once teachers' work consisted primarily of teaching, curriculum development, and student development, now much time is taken with the increased administrative load within schools. Smyth (1993) comments about reforms in England where:

...in moving from one form of supposed professionalism characterised by classroom-based isolation, we have come to embrace another supposed form of professionalism that involves collective school-wide responsibility based on narrowly defined though complex tasks within a context of shared management functions, clearly defined and appraised.

(Smyth, 1993, p5)

This situation is mirrored in many Australian schools as we travel along the path of decentralisation. Robertson (1993) noted:

Self-managing schools...carry within them the danger of engaging teachers in endless debate and a futile routine about means and not ends, at an enormous moral and social cost.

(Robertson, 1993, p132)

Many problems may arise through the process of treating a school as a free market agent. Not least is a philosophical change to the idea of education. Historically, educational institutes were seen to be separate from the daily pressures of commercialisation. Schools were seen as places where students increased their knowledge, although the hidden agenda of schools has been to present the socially accepted mores of society. The concept of schools as a commodity to be valued to the extent to which they can attract customers is certainly foreign to past ideology. Several other objections to the notion of self-managed schools have been presented by Smyth (1993):

- the emphasis on competition between schools rather than on democratic participation;
- the nature of centrally prescribed curricula instead of locally derived;
- hierarchical leadership while advocating team management;
• the lack of awareness of social, economic or cultural influence on schools and education;
• reduced funding is seen as a manageable necessity;
• schools are controlled through their student outputs rather than over practice (Ball, 1993, p77);
• schools can be blamed for the faults and difficulties inherent in the policies created by central control (Ball, 1993, p77);
• the principal is seen as both the beneficiary and victim of reform, both in and out of control’;
• the state is unwilling or unable to ‘finance the output’ given that a school manages to work within the guidelines of self-management (Hartley, 1993, p111);
• ever-increasing division between those who control the finance and those who educate. (Hartley,1993, p112); and
• will drain teachers of the energy, interest and capacity to respond to local problems.

1.5 CHANGING THE ‘STATE’ OF STATE EDUCATION

Many of the changes noted internationally have become reality in Victorian schools over the last seven years. In particular the Schools of the Future Program (SOF) is modelled heavily on the self-managing schools of other countries. Centralised curriculum (Curriculum and Standards Frameworks, CSF), standardised testing and SOF are all new directions and will be discussed in much more detail in the following chapter.
CHAPTER TWO

A STATE OF POLICY AND STRUCTURAL CHANGE

This chapter focuses on school education in the Victorian scene. I will more precisely specify the changes that have occurred and comment on the way these have proceeded. The various changes in policies and structures will be described to indicate the extent of change and to establish the idea of the 'State of Change'. This will give rise to a set of research questions based on the issue of structural change in Victorian education. I will establish prima facie the credibility of this issue by drawing on evidence from the workplace.

2.1 INTRODUCTION

Almost everything, from the exploitation of a fiscal crisis to 'sell' and legitimate major changes to the role of government (Britain and New Zealand) to 'Schools of the Future' (Britain) and case mix funding for hospitals (USA) has been brought off the shelf from elsewhere. (Ernst, 1994 - commenting on the Victorian Government policies)

When the Liberal-National Party coalition won the State of Victoria election in 1992, it indicated that changes would occur in all areas of public government. Many reforms were to be introduced in education, with the central premise that education could be run more efficiently and with more accountability to the public. The previous Labor State government had already been reducing the funding to schools, indicating that expenditure on education was difficult to maintain (Marginson, 1994). The dismantling of the old system rested partly on the argument that Victoria could not afford its present education system. The incoming Minister for Education, Don Hayward, had conceived a vision for education that would mean the total reformation of the financial, managerial and curriculum agendas of schools. His belief was that children needed '...a strong general education, including all aspects of language, numeracy, science, technology and an understanding of the cultural and historical heritage of their country.' (Hayward,
1995, p2). His vision meant the decentralisation of education, so that individual schools would be responsible for student learning. Ostensibly, from these thoughts arose the concept of Schools of the Future.

As we look at the changes introduced under the umbrella term of Schools of the Future, we can see the similarity to the ideology of the New Right and the concept of self-managing schools (both discussed in the previous chapter). Blackmore (1994, p145) states:

The Schools of the Future program is one example of a broad international trend to what are known as self-managing schools.

It is important to keep this in mind as we investigate the Schools of the Future program.

2.2 SCHOOLS OF THE FUTURE (SOF)

Definition: Schools of the Future covers both the process of change in Victorian schools and the schools in which the changes will take place.

(Schools of the Future Information Kit
Internet: http://www.dse.vic.gov.au
28/08/1996)

The phrase ‘Schools of the Future’ (SOF) was bandied around at schools a long time before teachers had any real concept of what this actually meant. Coming hot on the heels of the closure and merger of many schools, it caused teachers to be suspicious of any proposed changes that the government intended to implement. Most teachers believed that school closures were an economical measure related to dollar returns for the government rather than having any educational value. The introduction of SOF was viewed as a fiscal decision as well. In the early stages, information about SOF was brief, or esoteric. The Victorian Teachers Union was advising members to fight and rally against the changes, bound in the belief that nothing proposed by this government could be of any good to schools. Newspaper articles indicated that the SOF concept was very similar to what was happening in New Zealand education, and published some
damning reports of this. All in all, the introduction of SOF was neither smooth nor readily accepted.

Historically, SOF arose from a policy paper released in 1992 called ‘Education: giving students a chance‘. In this paper, quality education for students was aligned with devolution of decision making to the local level. Although the former state Labor government had tried to introduce devolution in the 1980s, it was only successful in reorganising school councils to accept some of the decision-making powers. The difference this time, was that schools and school communities were not asked or involved in the decision to devolve. Principals, school communities, teachers and other staff had this forced upon them.

The policy paper was worked over by a task force which developed its concepts into a more detailed account of how decentralisation of power and resources could be accomplished. Recommendations were given which indicated how decision-making and resource management could be shifted from the Melbourne and Regional Offices to the school community. The task force deliberated with community groups and produced a preliminary paper on SOF. The paper outlined the objectives of SOF, the development of a school charter, the implementation of a set of curriculum frameworks and the accountability of schools.

To undertake these changes in schools, the state government debated the Education (Amendment) Bill in Parliament late in 1993. This bill empowered the government to overturn some of the fundamental principles of the current education system. Although stating that decentralisation gave power to the schools, the amended Bill gave the government much more control over education, particularly in the areas of curriculum, school councils, finances, and accountability (Kronmann, 1993, p4).

Initially schools were given a choice concerning whether to become a SOF. In January 1994, 315 schools became involved in the pilot project to test the merits and ‘bugs’ of the SOF program. These schools were given additional funds to help them cope with the change. While many teachers saw this as a form of blackmail, it still meant that schools
supporting the SOF program were financially better off than those that were not. After a year of savage staff and financial cuts to schools, these ‘positive incentives’ added support to the idea of joining the SOF program. In the second intake in 1994, more schools joined. Unfortunately, they did not receive additional financial support, although principals and administrative staff were given training in various aspects of the budgetary package, CASES. At this point, the induction of schools into the program was on time. In a memo to schools in December 1993, the DoE had outlined that ‘all schools will be inducted into the Schools of the Future program by the end of term two, 1995...’ This timeline was an arrangement agreed to by the DoE and the Victorian Principals’ Federation. Without the support and physical ‘push’ of the principals of Victoria, the SOF program would not have succeeded if left up to teachers. Several schools around Victoria resisted the change with damaging consequences. At a special secondary school in Melbourne, the teaching staff refused to allow their school to be involved. When the DoE instigated the use of new computer software (CASES) to handle the salaries packaging, it refused to pass on the software to this particular school because it was not a SOF (personal communication, Broda, R. 1994). The school has resisted the pressure to become a SOF and is still, at the time of writing (1999), operating independently of the SOF program.

The overall aim of the SOF is to improve the quality of education for students by moving to our schools the responsibility to make decisions, set priorities and control resources.

(Schools of the Future Information Kit, 1996)

The DoE has indicated that SOF better answers the community’s requirements for schools to be more responsive to local needs. According to the DoE, parents were demanding an improvement in education with greater accountability by the schools for each student’s learning. Presumably the needs of the students could be better met by subscribing to the concept of local input. This begs the question that local input has not been used at schools. Particularly in areas of curriculum, schools have frequently used the resources and natural history of the local environment when teaching children. What has happened, in fact, is that:

- curriculum is now prescribed by a central body,
• schools are accountable to a set of externally set learning outcomes as well as an annual review;
• school councils can be audited for efficiency and effectiveness; and
• school charters have to follow a prescribed process and also be subject to DoE approval.

At the school level, we can see some of the positive aspects of the SOF program. Certainly there seems to be a greater flexibility in the manner in which the school funds are allocated. However this could be an illusion because staff are now much more involved with the curriculum budgets and are more aware of spending limits. School council power has increased over almost all of the funding entitlement. Again this can be seen as an improvement in terms of parental involvement, but it is worrying when untrained people make decisions which affect the short and long term viability of the school. This could be an extremely useful process, but is potentially quite dangerous too in the wrong hands.

All school staff face increased work loads. The principal, bursar and secretary have had to learn to implement the new administrative software package. This required extensive training, particularly for the non-computer literate person. The role of the principal has altered too. Rather than just be a school administrator, he/she must also be the advocate of the DoE initiatives. Being on government contracts, principals are answerable to the DoE to a much greater extent than in the past. The principal must act as the executive officer of the school council body, ensuring that DoE requirements are being met by the school council. Other responsibilities include the delivery of the school curriculum in the manner prescribed by the Curriculum and Standards Framework, the management of the school finances, and the review and evaluation of the school’s teaching and learning policies and practices.

Teaching staff face an ever increasing role. No longer are we facilitators of education, but we must be involved in the purchase of equipment (from the budgeting and ordering through to the acceptance and distribution of the goods), in the writing of school charters, school programs, school policies, auditing of school programs with respect to the CSF and a range of wider school tasks. Assessment and reporting have become
daunting tasks for many as we struggle with new technologies such as Kidmap, without adequate backup resources and training. After-hours meetings now take up much of the teacher's time. With the reduction of specialist staff at schools, teachers must now take on the additional burdens of the specialist, be it library duty or the organisation and administration of a sports’ meeting. These are some of the realities behind the SOF program.

Under the umbrella term of SOF, many developments have occurred. The titles of these are: Quality Provision; School Charters; Broad Policy Framework; District Liaison Principals; School based Personnel Responsibilities; Global Budgets; School Councils; Professional Recognition Program and Curriculum and Standards Framework. These changes have been swift in coming, and the time line for the implementation of so many modifications has been quite short in light of their number. Within each general category are a myriad of smaller, but not insignificant permutations. The next sections will explicate these developments.

Teacher and Community Perspectives

One principal in the Geelong region commented in 1996 about SOF:

It has increased my workload dramatically and, while giving me greater responsibility as a principal, has actually reduced my control. It has increased the use of sessional teachers and added to a teacher’s administrative workload.

Issues with relevance for this thesis are:
Increased administrative workload for teachers, principal and administrative staff.
Increased use of sessional teachers.
Reduced control for principals but increased responsibility

2.2.1 The Quality Provision Framework

Quality Provision is about Quality Curriculum
Quality Provision is about Quality Facilities
Quality Provision is about Community input

(Hayward, 1993, p1)
Under the heading of Quality Provision, the curriculum was designated into eight key learning areas which would be taught to all children from year P-10. Included in this was a compulsory language other than English (LOTE). The curriculum is further specified by the introduction of the Curriculum and Standards Frameworks (CSF). These are the guidelines under which all subjects are to be taught and outcomes have to be achieved. In years 11 and 12, all schools have to provide four unit sequences in at least two of the following: Arts; Health and Physical Education; Mathematics; Science; Technology and at least two further Victorian Certificate of Education (VCE) studies in commerce and humanities.

Quality facilities were to be achieved by multi-million dollar capital works and upgrades in Victorian schools. Specialist subjects were to be given a boost with the improvement of facilities, and grants would be available by selling the schools that were to be closed as a result of task force recommendations. A minimum size of 500 students was necessary for any new senior campus (private school system is exempt) and 1100 for any new K-12 school. There does seem to be some money being spent in some secondary schools within the Geelong area, but few primary schools can say the same. Numbers of specialist staff have been drastically reduced in primary schools due to changes in the staffing ratio, which particularly damages schools smaller than 250 students. The government has promoted the concept of improved professional development for primary teachers so that they can handle all aspects of the curriculum, rather than promote the idea of specialist teachers at this level of education. Many teachers believe that, for some areas of the curriculum, they have not been given the right sort of training, or inadequate training to handle the curriculum area. This pertains particularly to science, technology (including information technology) and physical education.

One of the objectives of Quality Provision was the achievement of budget savings through a reduction in the number of school sites and building stock. Fewer schools meant fewer principals, assistant principals, administrative staff, and less cost in building maintenance outlay. Schools which had closed could be sold to increase revenue for the government (ostensibly for schools). The process of change, the method
of determining which schools closed or merged, was determined by local task forces. The task forces were established by the DoE and consisted of principals, school council members and community members (sometimes). The task force had to assess a given school or schools to determine if closure or merger was feasible. Assuming 'big is better', according to policy, schools should merge or close to allow for the creation of larger, multi-sited educational institutes.

Don Hayward specified in an article of *Victorian Education News* that the 'central objective of the Quality Provision process is to strengthen Victoria’s education system so that schools can prepare our children for the challenge of a complex and dynamic future' (Hayward, 1993, p2). Many practising teachers would question his assumption that children were not being prepared for the future under the existing education system. Michael Norman, a leading educationalist, while addressing a group of Geelong’s leading teachers, stated that many overseas education facilities have been turning to the Victorian education system for years to access its successes (6 June 1995). For example: The Norwegian government has been sending teachers to Victoria to study the Project to Enhance Effective Learning (PEEL) for the last few years (this was set up many years ago by individual teachers). Educationalists in the United States of America have been looking towards the Victorian system to see how it works (personal communication, Michael Norman, 1995). While changes are underway in schools to follow many of the trends of overseas education systems, those very same groups are seeking answers to their educational problems within Australia.

**Teacher and Community Perspectives**

*A school principal was talking about the rationalisation of schools:*

*A certain amount of rationalisation had to occur and would have regardless of which party was in power. The processes and the magnitude of the effort were both inappropriate and an overreaction to budgetary restraints.*

*This principal noted that the overall effect was:*
Fewer teachers with greater workload. Less security leading to a loss of morale. Large amounts of time and money spent on school promotion. Greater competition between schools - less cooperation.

The principal went on to comment that the situation had not changed in the three years since its implementation.

A teacher commenting about specialist areas said:

...its an impossibility for us to cover those eight areas thoroughly, and I believe there's a necessity for specialists at the primary school. I think it's impossible to do all those areas justice as one teacher. We have so many responsibilities. ...most of us work at least a fifty hour week and more than that often.

Comments by another staff member were that as some of the closed schools had just had large maintenance grants spent on them, there seemed to be a waste of money. She also commented that she believed the DoE were out to close targeted schools. In a similar way, some schools seem to be favoured when it comes to receiving grants for upgrading their school's facilities. While some schools are desperate for money, they don't seem to attract the level of funding as others.

Issues with relevance for this thesis are:
Increased workload for teachers, more responsibilities
  Fewer teachers
  Less security - lower morale
School funds/time being spent on promotion
Greater competition between schools - less cooperation
  Crowded curriculum
Need for specialist teachers in some areas

2.2.2 School Charters

The school charter is a written agreement on how the school plans to deliver high quality education to its students over a three year span. It is the formalisation of the relationship between the school, its community and the DoE. The school charter is developed by the school council, the principal and staff, in consultation with community members. At our school, community members were invited to contribute and two parents participated in the planning and writing of the document. The format of the school charter is prescribed and is common to all schools. It uses the following
headings to delineate the contents of the document: school profile; school goals; school priorities; curriculum plan; budget plan; accountability plan; student code of conduct; and agreement.

At the end of each year of the charter, the school council has to report on the progress made towards the charter goals and priorities. At this time, the charter can be adjusted slightly, as long as the reasons for the changes are recorded in the minutes and included in the school's annual report to the DoE. Major changes, such as the addition of priorities or the extensive rewriting of goals, can only be made after the Regional General Manager is notified in writing. Alterations can be ratified after consultation between the three relevant bodies - the school council, the General Manager, and the Office of Schools review. If it is agreed that the school charter needs to be altered, then the Director of School Education is formally notified in writing. The final agreement between school council and Director is needed before proposed changes are accepted. This is a complex and lengthy process, and not one which schools would willingly enter unnecessarily.

The school charter operates for three years after which time it is reviewed. The review examines the progress which has been made towards the goals and priorities of the charter. Initially, there is an agreement between the principal and the General Manager about the focus of the review. Secondly, a panel consisting of staff and community members is established to identify ways for improving the previous charter. This team is also responsible for developing the recommendations for the contents and directions of the new charter. As with the first school charter, the school council, in consultation with the principal and staff, will develop the draft copy of the charter. A new charter is drawn up, with a new direction and focus, and the process starts again.

In practical terms, the school charter priorities are taken into account in many aspects of school life. Curriculum planning, special programs, professional development days, school excursions - all are planned with the school charter priorities in mind. This document has wide ranging effects on most aspects of school life.
Teacher and Community Perspectives

Comment from a staff member:

*How school charters are managed depends on who your principal is. Some don’t have the skills to facilitate the school charter properly. The charter is beneficial in that it acts as a guide or aim for the school.*

**Issues with relevance for this thesis are:**

School management very dependent on abilities of the principal

2.2.3 School Global Budgets

Professor Brian Caldwell was appointed in 1994 to develop a new funding mechanism for schools. Working with a committee, he handed down a report in August of that year which became the guiding principles for global budgets. The essence of these were: educational excellence is the most important factor, allocation of funds needs to be fair, budget arrangements need to be simple, decision making to be local, schools should be accountable and there should be minimal disruption.

The suggested benefits of global budgeting are to allow schools to take account of the learning needs of their students when making decisions about resources, to give schools one budget rather than a series of grants, to give schools control over their total budget, and to remove the restrictions imposed by separate grants. Certainly, all these features come into play at schools which operate their own global budgets. However in reality, the amount of money given to schools, based on the student index figures, is nowhere near sufficient to supply the resources a school needs. The school council is now finding that they have to raise more money to fund pre-existing programs, or lose some programs. Corporate sponsorship, advertising, chocolate drives, and a range of other fund raising activities now consume much of the school council’s time. Similarly, trying to locate volunteers to do repairs and maintenance to the school is another area that the school council tries to save money for the priorities of curriculum and learning needs.
The DoE also set up a number of other undertakings which were based on the learning characteristics of students. Among these were additional funds for: students in the first two years of schooling; students at educational risk, particularly in the area of literacy; students with disabilities. Further funding is available to rural or isolated schools, and for administrative support for all schools. These fall far short of requirements in many schools. Schools which have fewer than two hundred and fifty students are actually disadvantaged by the student ratio system of staffing. Rural schools need more support than just money. As regional centres have been shut down over the last few years, their support for isolated and rural schools has been removed. Previously, regional centres used to staff consultants in education (learning disabilities), speech therapists, hearing specialists, as well as a range of teacher support staff. Very little of this exists now, and it is the plan of the government to trim this back as far as possible. Children who have problems are no longer supported by the DoE, rather the parents must arrange for them to be assessed by private practising psychologists, speech therapist, etc. As some parents cannot afford this, it is left to the teacher to deal with children who need specialist intervention.

In June 1997, all the Social Integration Units (SIU) still in existence around the state were being reviewed with the idea of closure. This is one area of concern for teachers. Many students come from backgrounds of deprivation and dysfunctionality and require the services of the SIU. The school system has to cater for all students and teachers need professional help to cope with some of the distressed students in their care. In our district, our SIU was closed down at the end of 1998, despite the acclaimed excellent work it had been undertaking for the district. The staff of the SIU had been guest speakers at various seminars in Melbourne to testify to the successes and achievements of units such as the social integration unit. Ironically, some DoE representatives from Melbourne telephoned our school in early 1999 in an effort to contact the staff of the SIU (personal communication, Sue Knop, 1998). They wanted them to give further seminars outlining the benefits of the unit.

During 1995-6, a research project into global budgeting was set up by the DoE, conducted by a committee chaired by Caldwell. The final report of its findings was
available at the end of 1996. Perhaps the project would have had more validity had it been chaired by someone other than the main proponent of global budgets.

**Teacher and Community Perspectives**

*These are some comments from a school principal:*

*It has made the school more accountable for its spending and has required greater planning. It has increased use of fixed term agreements and has encouraged the school to outsource its financial management.*

*Comments from a classroom teacher who had just received her annual increment on time:*

*...if that's what global budgeting means, then I'm all for it.*

*Other comments from another staff member include:*

*More work is being sent to schools from central bureaucracy. The principal is taking on the bulk of the work load as most schools do not have more highly qualified staff. It does allow schools the opportunity to monitor funds.*

*Issues with relevance for this thesis are:*

  * More accountability.
  * More time required for planning budget.
  * Increased fixed term contracts.
  * Outsourcing financial management.

### 2.2.4 District Structure

To enable the changes of the SOF to be implemented smoothly, the DoE originally set up various support structures. One of these was the use of districts and district liaison principals (DLP). The districts are clusters of schools, up to thirty in some areas, and the role of the DLP is that of supporting ‘friend’ to school principals.

In 1995 there were sixty-one DLPs around Victoria, although in 1997 this number was reduced as the perceived need for school assistance is diminishing. The role of the DLP is to provide advice for schools in the implementation of the SOF process, to assist in the professional development of principals, staff and school councils, and to ensure that
all schools have access to student services and curriculum support staff. However the general talk among teachers was that they did not see the DLP very often, and that the job was inconsequential. Because our school housed the local DLP, we saw and heard of many of the duties of the DLP. Certainly, our DLP was busy. The value of these positions is difficult to judge from the stance of classroom teacher.

There were originally fifty-nine districts which were located in two large metropolitan regions and five regions in rural Victoria. General Managers were appointed to each of the regions and are responsible for ensuring that educational objectives are being met in their regions. There are a few further support staff, such as curriculum consultants, while the remainder of the support staff have been relocated within school structures.

Teacher and Community Perspectives

Comment from an administrative staff member:

It created more administrative work for the host schools without any initial support of extra funding or resources.

2.2.5 School based Personnel Responsibilities

Most of the personnel responsibilities which were previously handled by regional and central administration are now undertaken by schools. Schools are now able to manage many tasks under the direct guidelines of the DoE, legislation and accountability requirements. These include things like staff selection, payroll, leave entitlements, and workcover. To access full staffing flexibility, a school has to prove that it is a position to manage its workforce within its global budget. It must develop a workforce plan which will assist in decision making in regard to the global budget and will implement the management of human resources while satisfying accountability requirements.

Once the workforce plan has been accepted by the DoE, the school operates under full staffing flexibility and can appoint staff under the guidelines of the statewide career structures. These include the new career structures for principals, school services
officers and the professional recognition program for teachers. Schools now undertake the following responsibilities:

- salary calculation (for the central payroll);
- the financial management of staff salaries;
- all allowances;
- the principal’s remuneration - this is designated by the size of the school, however bonuses are allocated dependant on the successful completion of a ‘Performance Plan’, assessed by Regional Staff;
- absences from school; and
- approved leave and illness.

The workforce plan has to accommodate the leave requirements of the staff and consequently, a forward planning strategy is necessary. Of principle importance is student learning so leave is granted subject to minimum disruption to the student program.

Workcover claims are also managed by the school on behalf of the DoE. A rehabilitation program and return-to-work plan are part of the school’s responsibility in getting employees back to work. Occupational health and safety are the concern of the schools and the DoE. Schools must provide a systematic way of assessing and evaluating risk factors to workers, and should develop a plan for the improvement of workplace safety.

In real terms, this has meant a huge increase in the workload for school offices. In terms of education about new procedures, there has been no extra money to support staff whose administrative load has nearly doubled. The flow on effect is that teachers must pick up more of the simpler administrative tasks previously handled by office staff. There is a real animosity amongst many teachers who rightly feel that it is not part of their job to balance the curriculum budgets. In some schools this has created friction between administration staff and teaching staff.

*Teacher and Community Perspectives*

*Comments from a principal about SOF state that it has:*
...added to a teacher's administrative workload.

Comment from another staff member on full staffing flexibility:

The government has changed the rules again! Over-establishment teachers has been established again.

Other comments state:

...not really what it was meant to be, what we were led to believe would happen. Government have established such tight criteria that flexibility is lost.

Additional comments on staff selection:

...opportunity for schools to chose staff who 'fit in'. The disadvantage is that staff may be chosen more on personality than on skills. So much depends on the principal.

Other comments on Local Payroll are:

...totally increased the workload of office staff. It is very time consuming. Overall, while schools have more flexibility, in one way the rules governing their use of the money has increased thereby reducing their flexibility. There is much more control from above.

Issues with relevance for this thesis are:

Full staffing flexibility subject to changes.
Central control has been strengthened.
Power of the principal.

2.2.6 Broad Policy Framework

Four general sub-frames have been developed for the school system to allow schools to act and react under the Schools of the Future policy. Both improvement and flexibility are seen as being necessary in the school situation. 'Improvement' as schools are expected to focus in on improvements in student learning and 'flexibility' in the manner in which schools manage their resources.

1) The curriculum framework operates through the Curriculum and Standards Framework documents and provides the standards and expectations of a student's achievement in each of eight key learning areas. Course Advice documents, which
provide practical applications of designated key learning area foci, are being written and provided to all schools. While these documents are written by teachers, and can be very useful, it is yet another imposition on time taken for teachers to read and assimilate the material provided.

2) The **people framework** includes the new career structures, performance standards for staff aspiring to higher positions, and processes for staff selection and appointment. Contractual labour and limited tenure have now become part of the teaching career path.

3) The **resources framework** is the basis through which schools are allocated funds for their school global budget. The core activities of each school and the educational needs of the student body are the criteria by which schools are allocated funds. As previously mentioned, these funds do not meet the resource needs of schools.

4) The **accountability framework** is dependent on three separate elements - the school charter, the annual report to the DoE, and the triennial school review. Together these cover information on the school goals, student achievement, school performance and future directions of the school.

Using these four sub-frames, schools are expected to create an environment for the improvement in student achievement, and consequently the best future for each student. Again, evidence that students are not achieving at their optimum level has not been the inspiration for this structure. Nor is there any evidence to suggest that the new framework will achieve any better results.

*Teacher and Community Perspectives*

*One staff member commented on the career structure:*

...virtually no opportunities for advancement within your workplace

*An office staff member commented:*
Office staff are not encouraged to advance due to budgetary constrictions.

Issues with relevance for this thesis are:
Budgets control employment and careers.

2.2.7 School Councils

School councils have been in existence a long time and have had decision-making responsibilities since their inception. However, with the introduction of SOF the importance of school councils has increased just as their school based powers have. This is a direct consequence of the government’s action on devolution. The school council can consist of between six and fifteen members made up of the principal, staff, and school community. The staff component cannot exceed four, and anybody who is an employee of the DoE in any school is considered to be staff. This ensures that the school community, which outnumbers the staff component, can have the final say on contested decisions. This is probably one of the biggest changes to school councils - decision making has been made the province of the lay person. In most circumstances, the school council body would probably follow the recommendations of the principal, but there may be some instance where the parents hold the balance of power. The other areas where school councils have now increased their responsibilities include: the development of the school charter, student code of conduct and education policy; appointment of principal and non-teaching staff; reporting to the school community and the DoE; financial management of the school’s funds and accounts; and contracting for cleaning and construction work. All of these responsibilities are covered by DoE guidelines. In some ways, although assuming more responsibility for decisions in the above areas, the school council are actually given less by the DoE due to the stringent and unaccommodating guidelines.

Teacher and Community Perspectives

A staff member commented:

There is a huge increase in the amount of time expected to help school. ...subcommittee hogged down with administrative tasks rather than on improving children’s curriculum. School councillors
have no training, a diversity of backgrounds leading to power relationships being established.

2.2.8 Report on the Schools of the Future Program

The Cooperative Research Project was established in April 1993 as a partnership between the Victorian Primary Principals Association (VPPA), the Victorian Association of State Secondary Principals (VASSP), the Directorate of School Education (DSE) and the Faculty of Education at The University of Melbourne. Its purpose was to monitor the implementation of the SOF program. The five year study surveyed schools annually and conducted seventeen focused investigations (Thomas, 1998, p3). The results are summarised below.

Confidence in attainment of objectives - over the length of the study, there had been a significant decline in the belief that the objectives of the SOF program can be fully attained. Of real concern is the belief that teachers would not attain recognition as true professionals.

Realisation of Expected Benefits - there has been moderate to strong support for the areas of planning and resource allocation, although comments were made about the lack of resources. The document noted the ‘unrealistic expectation that there would be more resources’. Principals commented that there had been an improvement in student outcomes as a result of SOF.

School Charter - Principals reported high levels of achievements in the School Charter particularly in the curriculum and learning environment areas.

Professional Recognition Program - The results in this section were more modest. There has not been any improvement over the last twelve months in regard to items like: developing a leadership profile; building a professional team; and allowing highly skilled teachers to remain in the classroom. Rating high was a school’s ability to assess teachers as part of the annual review process.
**Full Staffing Flexibility** - It was noted that the benefits of Full Staffing Flexibility were few, with Principals commenting that the changes the DoE introduced impeded full implementation of Full Staffing Flexibility.

**School Global Budget** - Principals noted a high level of satisfaction with global budgets, being able to focus the resources on school needs. Comments were made about time and professional development being limiting factors.

**Accountability** - In all aspects of accountability such as parent/teacher surveys, annual and triennial reviews and school performance, the principals noted improvements.

**Curriculum and Standards Framework** - Improvements were noted in the capacity of the school to develop programs to meet student needs. According to this document, CSF is ‘consolidating its place as a central element of schools’.

**Professional Development (PD)** - This is cited as a ‘success story in Schools of the Future’, with the Teacher Personal Professional Development Plan making a major contribution to the capacity of the school to plan for professional development.

**Impact of Schools of the Future on Teachers** - Principals responded to two elements, goal congruence and teacher morale. In both cases they rated both moderately high, and showed improvement since the earlier surveys.

**Problems encountered thus far** - These were similar to earlier findings. Workload and time demands were distinguished as problems which were not diminishing or being solved. The report went on to note that this was an area of concern.

**Sources of Information** - Principal networks and targeted publications were noted as being of great value. For PD, collegiate networks, principal associations, and DOE initiatives were highly valued.
Sources of Support - Value was placed on principal networks, teacher networks, and Course Advice but less than satisfactory support from LAPS, and KIDMAP.

Accreditation and performance management - This gained a strong negative from the principals who could not find value in the present system of performance management. The document noted that much work needed to be done in this area.

Professional Development of Principals - Responses indicated that a comprehensive and structured PD program for principals be continued targeting areas such as team development, leadership and interpersonal effectiveness.

Workload of Principals - Principals continued to report heavy workloads but also reported that they expected this to be so. It is noted as an area of concern.

Job satisfaction of Principals - There is some variance in these responses with three distinct groups being identified. Two small groups with high and low satisfaction levels, and a large group who are generally moderately satisfied.

Taking all things into account - Principals were asked whether they would like to return to the system used before SOF. There was overwhelming support for continuing with SOF.

Impact of Schools of the Future on students, teachers and principals - For students, principals commented on learning outcomes and curriculum, registering more positive comments than negative. For teachers, the largest single response related to the increased workload for teachers. Positive comments were made about teacher involvement and the impact of CSF to learning environment. Negative comments were made about career uncertainty, staffing numbers, rate of change and resources. For principals, the largest single response was also on workload. Positive comments were made about self-management and negative comments about staffing, resourcing, rate of change, and decreased school level control of the curriculum.
Specifying the links between reform elements and the outcomes in curriculum and learning

The report examined the links between the findings of this and earlier surveys. The elements which impact directly on Curriculum and Learning Benefits have remained the same, although the effects of them have varied: Personnel and Professional Benefits, Curriculum Improvement, Confidence in Attainment of SOF Objectives. Results suggest that the following areas need to be given a higher priority; staffing flexibility, principal performance management, and principal and teacher workload.

I found the results of this longitudinal study of interest, but less meaningful than it could have been. I question why only principal groups were involved in the surveys and exactly which parts of the research findings were attributable to research students at the University of Melbourne. There are many more interest groups involved in the SOF program and I wonder if their opinions or impressions have been sought. Without casting doubt on the integrity of the principal groups, they see things from a different perspective from other groups. They are in a position of power and from their standpoint, they want or need to see SOF succeed.

2.3 SCHOOLS OF THE THIRD MILLENNIUM (SOTM)

In April 1998, Phil Gude, the then Minister for Education, unveiled the new policy of Schools of the Third Millennium (SOTM). The policy gives schools greater autonomy than currently experienced under the SOF program. SOTM will be able to hire and fire all teaching and non-teaching staff and to enter financial arrangements with businesses. To become a SOTM, schools have to meet the following criteria and present evidence supporting the criteria:

- Clear School Council support (Statutory requirement)
- Triennial Review (or copies of previous Annual Reports)
- A comprehensive curriculum plan
- Strong leadership and effective management
- A strong business plan and financial management
- A well-structured workforce plan
• Long term viability

(Extract from a letter addressed to School Council President
And Principal (August 1998) from the Office of Strategic
Planning and Administrative Services)

In an article in *The Age* newspaper, Jones (1998b, p6), the education reporter,
commented that:

No other state has encouraged schools to proceed so far down the
corporate path by adopting controversial management models
inspired in the United States and Britain.

She further commented that concerns had been raised about the blurring of divisions
between education and the corporate world and how these could affect School Council
decisions. After the passing of the Education (Self-managing) Bill in April 1998, other
concerns were voiced by the Australian Education Union, the Federation of State School
Parents Clubs and the Victorian Council of School organisation. They believed and
stated that the new system would:

• create poor and rich schools within the government system;
• threaten teaching positions under school council control;
• shed government responsibility for schools;
• treat education like a business.


Karen Meuleman (representing Parents Against Large Class Sizes) wrote into *The Age*
newspaper (Meuleman, 1998, p12) with comments relating to Self-managing schools.
She mentioned several different things like ‘shifting the responsibility for the funding of
a public facility from the public purse to the private sector’, ‘giving an additional
administrative load’ and ‘giving vested interests a powerful role in our educational
institutions’.

Principals in the Geelong area met early in August 1998 and the general feeling was that
at that stage, SOTM would not proceed in the region (comment to School Council
meeting, August 1998). Since then, several schools have become SOTM, several have
expressed an interest in becoming a SOTM, but the majority of schools have declined
the DoE's offer. SOTM are funded through a system that allocates the average salary amount per teacher. The school has to then decide how it will distribute this. For many Geelong schools, with a greater proportion of older, more highly paid staff, this funding mix would not allow sufficient money to pay staff salaries. Only in schools where a large number of staff are on short term contracts or are junior staff, can this work. The question I ask is: What will become of our schools as the senior, more experienced staff are slowly replaced by younger less experienced staff? As these younger staff gain experience and cross that 'average salary' threshold, will they also lose their teaching positions? The experience in American Charter schools is that staff are offered a salary much lower than that offered at public schools that have not taken up the offer of becoming a Charter school (Graham, 1998).

2.4 CURRICULUM AND STANDARDS FRAMEWORK (CSF)

The Victorian Curriculum and Standards Framework (CSF) is a document which provides the guidelines for curriculum development across seven levels and in eight key learning areas (KLAs). The KLAs are designated: The Arts; Science; Technology; Languages other than English (LOTE); Health and Physical Education; Studies of Society and the Environment; Mathematics; and English. Each key learning area is arranged into strands and sub-strands. The strands indicate the main theme or theory area for study and the sub-strand further classifies this into minor themes or topics. Statements of intended learning outcomes for students are included in each sub-strand and provide a basis for reporting on student achievement. Within the CSF, there are seven levels. Level one equates approximately to the first year of schooling. Level two equates to grades one and two, level three to grades three and four, level four to grades five and six, while levels five to seven cover the first four years of secondary schooling. The Curriculum and Standards Framework document is based on the curriculum document, developed nationally, with significant changes to suit the Victorian situation. Many teachers question the need for Victoria to have its own curriculum documents in light of the presence of the national ones. The national curriculum was worked on by teachers, academics and bureaucrats from around Australia for many years and was
meant to represent a cohesive approach to Australian education. However, the autonomous states and territories adapted this material.

In December 1993, the Victorian Minister for Education, Don Hayward announced for a second time that he would oppose the development of the national curriculum and stated that he wanted all states to develop their own curriculum (FTUV Federation News, 26 November, Vol. 4, No 31, 1993, p2). At the meeting of the Australian Education Council (AEC) in July of that year, Don Hayward moved the motion that the program of national curriculum statements and profiles be abandoned (Maslen, 1993, p22).

...it was agreed that Don Hayward from Victoria would move the motion calling on the AEC not to endorse the national curriculum Statements and Profiles.

(Ellerton & Clements, 1994, p260)

This seemed to be in conflict to what was indicated in the Education News (27 May 1993), in a supplement entitled 'A Quality Provision Framework For Victorian Schools'. In this supplement (p7) it is stated,

Students in all primary schools and secondary colleges must be provided with high quality programs that allow them to progress at a satisfactory rate in the learning areas of the agreed National Curriculum Areas P-12.

Furthermore the supplement went on to give a comparative breakdown of the areas of the National Curriculum statements to the Frameworks P-10. Less than two months later, Don Hayward was opposing the nationally developed Curriculum Statements!

2.4.1 Reaction to the CSF

In 1993, the Board of Studies was established and replaced the previous Victorian Curriculum and Assessment Board. The Board of Studies (BoS) is responsible for the development of the Curriculum and Standards Framework P-10 and the Victorian Certificate of Education (years 11-12). The Accreditation Branch of the BoS has a staff
of curriculum experts and apart from developing the CSF, provides assistance and advice to teachers (Board of Studies Newsletter, June 1994). When the original draft of the CSF document was published and presented to schools for perusal and comment, teachers were incredulous with the thrust of the new document. It seemed so prescriptive and allowed little room for teacher input. It also seemed to cover a huge number of outcomes, all of which had to be used in student assessment. The final CSF document, in the form of eight individual books (one for each key learning area) seemed, if anything, to be larger and even more precise than the draft. Teachers were required to accept, study and assimilate the contents of each of these books. It seemed a daunting task. With increased class sizes, more administrative tasks, teachers asked how they were going to find the time to do all of this. The response of the DoE was to promote professional development, and to supply experts to discuss the contents of the documents with teachers. In each region, Key Learning Area Networks were set up and provided with a budget of approximately one thousand dollars per annum to promote, and explain the best practice for using the CSF. The messages to teachers were confusing at best, and conflicting at worst. At a conference in Melbourne in June 1995, a leading educationalist, David Clarke, said that it was impossible for teachers to report on all outcomes across all areas and recommended that teachers used the focus statements as the guiding principles for assessment and reporting. Teachers applauded this sensible approach to the new document. Unfortunately, a representative of the DoE, Cliff Malcolm, at the same conference espoused that teachers should be looking at each student across several CSF levels for each curriculum area. In one sentence, this person had tripled the expected load of teachers.

Several years on, and teachers are still trying to come to grips with the CSF document. Audits of existing programs in the key learning areas have been undertaken at most schools so that teachers can continue with their own programs, or slightly modified ones. Some teachers still believe that students have to be measured against all the outcomes, or as many as is humanly possible. This creates a tense and unrealistic situation as teachers seek answers in texts written specifically to measure CSF outcomes. ‘Working smart’ is a phrase that has cropped up in teaching in the last few years. Essentially it means to try to move with the tide of changes, or at least to be seen to be
moving. To try to accommodate the ever increasing tasks allotted to them, both administrative and curricular, many teachers are becoming very mechanical in their teaching.

2.4.2 Accountability

Accountability has become one of the main thrusts of teaching. Not only is a student to be assessed using the CSF guidelines (read outcomes), but when reporting to parents and students, teachers must also use the CSF. Many teachers thought that this would be easy. Just report those outcomes that students have achieved, and comment on the others. Unfortunately, as many schools found out, parents did not like, or were unable to interpret, the outcome statements. So now we have teachers teaching their normal programs, but measuring student success in terms of outcomes. With these data, they assign a student a place along the level 1-7 continuum, and report to parents in layman’s terms as they have done for years. Double jeopardy! Who are all these outcomes being measured for? The parents do not necessarily want them, teachers have such a variety of methods of assessment that they do not need them, so why are they used?

To make the teacher’s task easier, KIDMAP was developed and purchased by the DoE. This is a curriculum tool used for planning, assessing and reporting purposes. In its initial stages many computing enthusiasts embraced KIDMAP only to find out that it still had many bugs. The second version was much better and schools attempted to install and use it. The problems that arose came mainly from two sources. Firstly, teachers were not sufficiently computer literate to just pick up the new technology and go with it. It took many professional development sessions for most teachers to feel comfortable with the package. Secondly, many schools were under resourced when it came to the availability of computers for teacher use. The computers that were being used in some classrooms were not of sufficient capacity to carry the KIDMAP package. Schools had to re-evaluate their priorities, their money and their professional development time. Over the years of 1994-97, teachers have spent most of their professional development time trying to come to terms with the changes of the CSF. Very little time has been available
for developing teaching practice, trying new educational initiatives, or exploring
contemporary educational theories and their implications for practice. Professional
development has become a vehicle for compliance with the CSF and other DoE
initiatives.

At the time of writing this document, schools were reviewing CSF II. This draft
document was sent to schools in April of 1999 and teachers were asked to comment by
the end of June 1999. The new document is an overview of all the Key Learning Areas.
It states that the new structure will:

- create more time for skill development in literacy and numeracy in the early years;
- set priorities among the competing demands of the curriculum;
- focus on essential concepts, content, processes and skills; and
- link the stages of schooling and learning in a more comprehensive manner.

(Curriculum and Standards Framework II - draft, Board of Studies, 1999, p1-3)

To accomplish the above, the number of strands has been reduced and the strands
simplified. Particularly at levels 1 and 2 (Grades preparatory - three) CSF II should
allow a greater concentration of the basics of early education in literacy and numeracy.

Teacher and Community Perspectives

One teacher commented:

...we looked at the National Curriculum Statements because we felt
that they were superior to the CSF in lots of ways. ...basically the
CSFs are a watered down version of the National Curriculum
Statement documents anyway.

Another teacher (who has since retired) commented that she didn’t use
the CSF for teaching.

When asked how she uses the CSF document (1998), another teacher commented that ‘it’s not a bible’ meaning that she did not refer to it frequently. She then commented that she looks at it once every six months. She also went on to say that she found parts of it very dry and that:
I'm not prepared to just teach a lesson because I'm told that I should.

The teacher went on to indicate that she used her knowledge of the National Curriculum Statements which were similar to the CSF anyway. She used CSF documents more as a check rather than as a planning basis although she was working on reversing that trend.

In a contradictory statement, the teacher said that she used the CSF document when planning to look up the skills that students had to achieve.

Another teacher commented that:

...the CSI's are not always based on the interest level of the children what this CSFs thing has done is put an emphasis on topics in science that normally I wouldn't have considered that children have a great deal of interest in.

I believe that its an impossibility for us to cover those eight areas thoroughly. I think it’s impossible to do all those areas justice as one teacher. ...how unrealistic it is for the ministry to expect us to cover, adequately, eight key learning areas without the assistance of a specialist. You can only pose some sort of token respect to that area.

Other teachers grumbled when handed out Kidmap material, saying that it was another imposition on their time (Journal entry, 5/10/96)

Issues with relevance for this thesis are:
- Teachers do not fully support CSF documents or Kidmap.
- Relevance of CSF content.
- Workload for teachers - crowded curriculum.
- Accountability has increased dramatically.

2.5 LEARNING ASSESSMENT PROJECT (LAP)

As well as the changes in the curriculum documents there has been the introduction of formal, statewide testing at particular levels of primary schooling. In 1994, the Board of Studies (BoS) proposed the testing of all primary children in grades three and five. Named the Learning Assessment Project, or LAP for short, the new procedure was introduced into schools in May 1995. According to the BoS newsletter (June 1994), the LAP would provide ways of expanding the assessment methods used in primary schools. The article went on to state that the project would help students by giving information to parents and teachers of the student’s progress against state-wide standards. The project
is propounded to give parents an indication of how their child is progressing so that they can be more effectively involved in helping their children. Similarly, the LAP would help teachers and schools by giving a new source of information about their students and validate the teacher's own assessment. Students with difficulties would be identified and programs developed to assist them. Teachers would be able to compare their students against a state-wide average. Furthermore, the article went on to say that LAP would help teachers to plan teaching programs. The Victorian community would benefit as well as it would be able to more accurately assess standards in schools and have more confidence in the school system.

2.5.1 Reactions to the Introduction of the LAP

Right from the beginning there was both parental and teacher resistance to the LAP. Parents thought that it was an unnecessary pressure to place on their children, and the parents who objected already had confidence in the schooling system. Teachers could not agree with the concept of state-wide testing, of comparing one child to another. They were sceptical of how the information might be used, and felt that their own assessment of the student would be more accurate.

In *FTUV Federation News*, Anne Davies (1994, p9) stated that at a recent Federated Teachers Union of Victoria (FTUV) seminar, participants had expressed the view that comprehensive assessment is best undertaken at the school level. This was based on the fact that school-based decisions on appropriate curriculum affected what students learnt. The question was raised: Would the testing eventually affect the content of the curriculum?

Other arguments expressed by The Education Coalition (consisting of the Victorian Secondary Teachers’ Association, Victorian Council of School Organisations, Victorian Independent Education Union, Federated teachers Union of Victoria and the Victorian Federation of State School Parents’ Clubs) in the *FTUV Federation News* (20 June 1994, p8) was that universal testing was not necessary, given the amount of information
already available through schools. Tests were not reliable due to a number of factors such as content, cultural bias, amount of content represented in a test and variation from year to year. The possible negative ramifications of testing were outlined. These include the possibility of comparisons between schools, teachers and children. If the test becomes all-important the possibility of 'teaching to the test' becomes a real worry and another threat was the possible damage to students' confidence. Although stating that the results will be confidential (BoS Newsletter, June 1994), it is Government policy that schools should publish their own results alongside State norms. A final argument against the introduction of the LAP was the time and resources needing to be spent – teacher time, student time, schools resources. All for an intangible gain.

Since the LAP was introduced, many of the arguments against its use have been found to be credible. Teachers find that they really do not use the information, as their own sources are more accurate. Although parents allow their children to undertake the tests, many do not seek the results and place little importance on them when compared with the teacher's assessment.

2.5.2 LAP Implementation

The LAP, in 1995, consisted of an English assessment and a Mathematics assessment. The English assessment had three tasks. The reading task, lasting approximately half an hour, was centrally marked. A writing task, consisting of two components (one marked by the teacher, the other centrally marked) took approximately two hours of school time (and many hours of teacher time for marking!). The listening task took approximately thirty minutes of class time to run the test. Add to this the time it took teachers to read and assimilate the LAP arrangements, then extra time in setting things up (such as rearrangement of specialist timetables, sharing of classes due to composite grades) and a lot more time was required than just the administration of the tasks. No additional resources were given to schools to help them administer the tests. At our school, because of the composite nature of the classes, grades had to be split up for the duration of each test and children allocated to other grades for these periods. This placed a
burden on the staff who were not administering the tests. Children, while given
activities to do in the other classrooms, were often not in a learning situation, rather they
were biding their time until returning to their own grade. Owing to specialist programs,
sports days and other school commitments it was very difficult to actually schedule the
tests in to suit all staff involved.

In addition, the marking of the written English tests required the teachers involved to
meet outside school hours, to interpret the marking technique required and to assess in a
similar manner. Each child’s writing took at least thirty minutes to analyse. With about
thirty grade three children this added an extra fifteen hours of work onto these teachers.
Similar times were accrued for the marking of the grade five literature task. The school
had no way of making this easier. There were insufficient funds to allow for
replacement teachers. The DoE was really relying on the goodwill of teachers and their
relationship with the school principal to make this work.

The Mathematics assessment also consisted of several tasks. One on number took thirty
minutes of class time and was centrally marked. The measurement and space task had
two components, one which was centrally marked and took half an hour and one which
needed teacher assessment. The teacher-assessed task was meant to only take forty
minutes, but due to the restrictions of the materials supplied for the construction task,
the structures kept collapsing and the whole enterprise took at least double the time.
There were several ambiguities in the original tests, ones which were taken up with the
entire staff to gain consensus before giving to the students. Children needed much
assistance in interpreting the questions, which again delayed the length of the test. The
dilemma faced by teachers administering the tests was - should the test be lengthened to
accommodate the confusion therefore making the test more arduous, or should the
original times be adhered to and possibly jeopardise the students’ scores when
compared to State-wide norms? At our school, we compromised, adding a little bit of
time onto the allotted task time.

In 1996, a Science assessment was added to those of English and Mathematics. Again,
teachers were expected to administer the tests and complete extra corrections in their
own time. As with the first LAP, this one was also plagued with problems. In particular, the level of the science interpretive questions seemed to be well above the ability of the students and above the Level 3 and 4 guidelines from the CSF document. As a result of low scores for the year fives at our school in literacy, the DoE made an additional five hundred dollars available to the school to assist these students. This was used to give these students specialist assistance of approximately one hour each. Teachers and parents felt that this token gesture was insufficient given the nature of the problem.

In 1997, Studies of Society and the Environment was added to the LAP, and Science removed. Over the next three years, Health and Physical Education, The Arts and Technology will all be assessed in their turn.

The LAP is ongoing, despite continued teacher and parent resistance. Teachers involved in the LAP testing do not overexert themselves to run the test properly, or give the marking the attention that is desired by the DoE. The results are questionable for these and other design reasons. Parents, while showing an interest in the results of their child, do not seem to pursue the results of the LAP tests.

2.6 STAFFING - POST 1992

In its first two years in office, the Liberal-National Party coalition reduced spending on education by three hundred million dollars (Australian Educator, 1994, p4). This came about in a number of ways - by not replacing staff who retired or took redundancy packages (about eight thousand in all), by reducing the number of schools (over 300 schools closed), and by a general reduction in spending on education.

In schools, the effect of these reductions have impacted in several ways. Firstly, the total staff at the school has been reduced in number, unless the school population has increased. At our school in 1992, with pupil numbers of about 160, the base staffing was about twelve, although one of this number was designated as being above our staffing ratio. Now, six years later, with an increase of over fifty students, our base
staffing number is 9.6 (these figures include the principal). We have decreased our staff by about one and a half while increasing our student body. Effectively this means that grade sizes should have increased from about twenty-five students per grade to around thirty students per grade. To offset these high numbers in the classroom, the principal has employed a graduate teacher, on a low salary, so that there is an increase in the number of grades and a subsequent reduction in grade sizes. This has to come out of the school’s global budget and is certainly not allowed for in the pupil:teacher ratio. To offer the specialist programs that were once a normal part of the curriculum, the school council pays for these teachers from funds raised by the school community or the global budget. Again, this hiring of specialist staff is above our DoE allowance. Specialist teachers are expected to work with considerably less preparation time than previously allowed. Most of the specialist staff at our school are part time teachers who find that they have to spend many hours of their own time to complete their preparation.

Under the current award, primary teachers are given two and a half hours per week for preparation. Over the last few years, there have been times when teachers went for weeks without any preparation time, or one stretch of six months when only one hour per week was available for preparation. This has made the staff much less flexible when it comes to the loss of preparation time. Prior to these changes in schools, teachers did not mind occasionally losing their preparation time for the benefit of the student or school as a whole, but now most will object if it is suggested. The goodwill of teachers has worn thin with the constant demands placed upon them by the DoE, the system and the principal.

Class sizes have also increased as a result of the reduction in education spending. Pupil teacher ratios (PTRs) are calculated by dividing the total number of students by the total number of staff, including the principal and administrative teachers. These calculations seem attractive with approximately one teacher available for every fifteen students. However, actual class sizes are large with some grades having to seat over thirty students. In 1994, Victoria ranked fourth of all government school systems with a PTR of 1:15, a worsening from the figures of 1992 of 1:13.4. (FTUV Federation News, Feb 24, 1995, Vol. 6, No. 5). In 1995 and 1996, class sizes at our school averaged about
twenty five students per class. However, to keep the junior grades low (say 20-24), the upper school grades were carrying an average of thirty-two pupils. There was no way around this problem. There was not enough money to employ additional staff.

The Australian Industrial Relations Commission recognised the increased workload for teachers in February 1995 with this comment:

...that teachers in Victoria generally work long hours which include substantial working time outside of school hours and that their workload has increased significantly over recent years.

(VISTA News, Feb 27, 1995, Vol. 16, No. 4, p1)

Continuing with its summary, the commission recognised the situation of increased class sizes in schools, but declined to offer any solution to the problem. It suggested that a student/teacher ratio ‘would not necessarily ensure that a teacher’s workload was fair and reasonable’.

In facing the press on the first day of the 1995 school year, Don Hayward (Minister for Education) commented that class sizes were a school decision. He made no mention of the reduced staffing levels, or the increase in PTR. (FTUV Federation News, Feb 3, 1995, Vol. 6, No. 2.). In a study undertaken by the New South Wales Directorate of School Education, it was found that student learning, and student self-esteem both improved with increased numbers of teachers. (Sydney Morning Herald, Jan 21, 1995 in FTUV Federation News, Feb 3, 1995, Vol. 6, No. 2.). Reading, writing, listening and talking skills were shown to improve among students allocated extra teachers. In Victoria, official data show that there has been a significant increase in class sizes (Jones, 1998, p1). Over the two year period from 1992 to 1994, primary classes with more than twenty-five students had increased from 40% to 62%. There was also a five fold increase in classes containing over thirty students, in that same period.

Don Hayward in an interview with The Age newspaper, admitted that very low class sizes produced better results (Richards, 1994, p6). However, he went on to say that it did not really matter once class sizes increased to twenty-five or more. Rather than take the low class sizes, as existed in schools in 1992, and try to improve the numbers so as
to enhance learning, Hayward has used the figures to justify the reduction in spending and subsequent increase in class sizes. His rationalisation is spurious at best and dangerous at worst.

Increased class sizes have been blamed, along with other factors, for the reduction in children attending the state school system (McCaughey, 1994, p9). Independent schools, while costing parents more, can still offer smaller class sizes than state schools. There has been a swing away from state school enrolments and an increase in private school numbers. Within six months of the Liberal-Coalition government coming into office, the previously steady increase in enrolments at government schools had taken a plunge. Coincidentally, independent schools had increased their enrolments sharply, by about the same amount as were being lost from government schools (The Age, 12 September 1994, p6). Hayward’s comment was that students (secondary) were leaving the school system to get jobs with the improvement in Victoria’s financial state (The Age, 12 September 1994, p6). This was not substantiated by figures, and in fact, Victoria’s jobless in the 15-19 age group remains one of the highest in Australia, and has increased over the years of the Liberal-Coalition state government.

Teacher and Community Perspectives

One teacher commented:

...we have two and a half hours preparation time a week if we are lucky. I really believe that there is a lack of understanding particularly about the work levels that primaries are expected to do.

Another comment by the same teacher when relating to taking a large buddy group:

...you’re coping with less than adequate staffing ratios.

Discussing how to cope under that situation the teacher commented:

We had to be flexible because of all the other constraints.

Issues with relevance for this thesis are:

Lack of time for preparation.

Poor staff ratios, morale.
2.7 PROFESSIONAL RECOGNITION PROGRAM

The career structures in teaching have also changed in the last ten years. In 1989 when I first came into teaching, the system was based very much on seniority, the number of years of teaching defining when a person became eligible for promotion. It was a very static system, with very little chance of professional advancement. This did not seem to worry the majority of senior teachers who were happy with the status quo. Other more progressive teachers recognised that the career structure needed changing. In primary schools, most teachers were classified as Band 1 or Band 2. Head teacher was the term for a teacher in charge of a small school or a department within a large school. Vice-principal and principal were the top of the career ladder. In secondary schools, the senior teacher position was the one given to the head of a curriculum area or department. Another grading was offered, that of senior responsibility position (SRP). These were either permanent positions/allowances, with three levels, or could be given as an add-on allowance to teachers for extra tasks.

At about this time (1990) another career structure was introduced. It sought to recognise exemplary teaching and the management of a range of wider school responsibilities. Advanced Skills Teaching (ASTs) was the name tag given to these promotional positions which could not be gained with less than ten years of teaching experience. This structure placed some individuals at a disadvantage - those with natural teaching ability could not gain any accelerated promotion, and those who had worked in other careers with transferable skills also were not recognised. Within the new structure, SRP allowances were maintained. SRPs acted as incentive payments to those not able to gain an AST promotion, but did not carry anywhere near the same remuneration. The AST system was readily accepted by most teachers, although the procedure for gaining a promotion became more rigorous and demanding. Many teachers felt threatened by the need to justify their teaching capabilities to a panel of peers consisting of colleagues, principal and a DoE representative. There was variation from school to school and from secondary to primary in the manner in which the positions were ascribed. While some panels took their job seriously and administered their tasks according to the prescribed guidelines, others looked on this as the
opportunity to reward teachers and essentially approved all applicants without the rigour required. The second year of AST applications saw the settling down of the procedure as more teachers became aware of what was required of both the applicants and the panel members.

Another government, another career structure! With the emphasis that the current Liberal-Coalition state government has placed on devolution and accountability, it was necessary to align the career structure with those philosophies. Teachers were being given a great deal more responsibility for the implementation of government initiatives. To 'assist' teachers, the Ministry of Education developed a career structure based solely on merit and the acceptance of responsibility. The reality became that those who were prepared to 'push' the DoE initiatives would be rewarded. The Australian Education Union advised its members not to accept the new career structure.

In the *Victorian School News*, the Director of School Education, Geoff Spring (1995, p2) wrote that:

*The key features of the Professional Recognition Program involve:*

- moving to a system of recognition which acknowledges the full extent of teachers' work;

- rewarding teaching excellence through accelerated progression, removal of eligibility barriers and the introduction of recognition incentives for outstanding contributions;

- implementing the flexibilities required to meet the needs of Schools of the Future;

- providing four levels designed to support the educational activities of schools;

- going beyond the AST concept to one of leadership enhanced by advanced skills knowledge and professional expertise making a significant difference to improved student learning;

- recognising the special career development needs of beginning teachers;
• introducing a framework for probation;

• allowing highly skilled teachers to remain in the classroom and yet access salaries commensurate with the principal class;

• removing the inconsistencies between the existing primary and secondary structures.

While the majority of the teachers would agree with the principles espoused here, there were aspects of this career structure which were detrimental as a whole to the teaching system. According to the Peter Lord (1995a, p1) of the Federated Teachers Union, the signing of the form to join the PRP would alter the legal aspects of teachers under their contract of employment and under the Teachers Award (Interim) 1994. Pay increases issued through the PRP would not be under award conditions and as such could be removed at any future time. The four tier structure of the PRP would be subject to the decision of the principal and the school's financial situation, that is it is not a prescribed structure. Under the PRP, some components of the salary are removed from superannuation entitlements, meaning that benefits on retiring would be reduced.

Cynically, the FTUV President Peter Lord said that if teachers went with the PRP, the state government could argue strongly for the abandonment of the Federal Award that covered most Australian teachers (Lord, 1995a, p1).

The introduction of the PRP was sugar coated. An immediate increase in salary was offered. Although it was stated as being a six per cent increase, the FTUV notified teachers that this would include the salary increases already awarded through the Federal Award. As the union was pursuing an 8.6% increase with the Australian Industrial Relations Commission (AIRC) at the time, what was being offered to teachers with the PRP was actually less than the 8.6%. Some teachers signed across, but the majority remained under the other system. The PRP was not abandoned, but due to lack of support, was not fully operational. Eventually the government had to negotiate with the unions and in 1996, another career system was put to teachers. This was based on the PRP, but with concessions. This was accepted by teachers in June 1996 after approval by the AEU.
The PRP uses the structure of Teacher Level 1, Leading Teacher, Assistant Principal and Principal. The Teacher Level 1 has twelve levels of remuneration, while the Leading Teacher class has two levels (2 & 3). Assistant Principal Class has three levels and Principal Class has five levels dependent on the size of the school student body. The new structure allows for accreditation of Leading Teachers who undergo a lengthy and arduous testing procedure. This opens the way for incentive bonuses and over-award payments for extra work. Teachers (Level 1) can access over award payments for specific tasks. Realistically, these over award payments rely on extra money that the school might have. If fundraising is low, or the money is needed elsewhere, then these payments are not available.

At a simplistic level, the benefit of this system is that those teachers who wish to carry an extra load can be paid for it. It does not recognise that all teachers are already carrying massively increased workloads. This was acknowledged by the Australian Industrial Relations Commission in its investigation into teachers' conditions (VSTA News Feb 27, 1995. Vol. 16, No 4, p1). Another benefit is that teachers, without seniority but who demonstrate the right qualities, can advance through the career structure. Again, in practical terms, this means that teachers who take up the initiatives of the DoE, and are prepared to work at them, may be rewarded.

The reality of the new career structure may not be felt for many years. To seek promotion outside a base school, teachers must be prepared to sign a limited tenure contract. This lack of security means that many teachers are not prepared to move. For younger teachers, this will have a dramatic effect on the long term viability of teaching as a career. A newspaper article (The Age, 14 May 1998, p17) stated that the low status of teaching, which directly impacted on the number of new trainee teachers, was partly due to job insecurity.

*Teacher and Community Perspectives*

*Relating to the PRP, one teacher commented:*

*I object to being made to jump through the hoops, surely our principal knows what sort of teacher I am.*
Another teacher commented that prior to the PRP, staff had to wait at least ten years before being eligible for promotion. Another comment was that performance standards were valuable at the personal level.

Issues with relevance for this thesis are:
- PRP seen as an additional burden by staff.
- Status of teaching poor.
- Job insecurity for new graduates.
- Teacher 'rewards' and acknowledgements based on how well they complete DoE requirements. No mechanism for rewarding good teaching.

2.8 THE CHANGE TO TEACHING PRACTICE

The number of changes and the time span to implement these changes have impacted directly on teachers' classroom practice. Although the basic elements of teaching continue to be the same (e.g. decomposition maths is still taught in the same way), the content and depth of curricula have been altered. Teachers have completed audits on their programs to ascertain if they fit with the CSF course guidelines. If an existing program does not fit, then it must be altered. Some teachers have discarded their programs altogether and are working only using the CSF. The time it takes to read the CSF for each of the key learning areas (KLAs) and to devise new programs has meant that less time is actually available to physically prepare for the lessons themselves.

2.8.1 The Crowded Curriculum

Although teachers have always taught a broad curriculum, it is now very specific. Time allocations have been suggested for each KLA. For example, in grade six, students are expected to have three hours of each of the KLAs. This would mean twenty-four hours of teaching and they receive twenty-five. However, even at the highest level of primary school, students need much more than three hours in both English language work and mathematics. The only way to fit everything in is to integrate the curriculum areas. In theory this may work, but in practice, the basics of some subjects need to be taught independently of context. Teachers feel that the curriculum is crowded, to the detriment
of the basic skills of language and mathematics. Along with the KLAs, other discrete curriculum areas now impinge on classroom time. Most schools are expected to hold a swimming program, teach bike education, road safety, personal safety, sex education, life education (through Life Ed. vans), personal development and offer counselling for students in need. Add to this the enrichment activities, such as inter school sports, excursions, cross-age tutoring, and the actual classroom time starts to diminish. Many of these discrete programs do fit within the guidelines of the CSF, and as such can be integrated, but classroom time is still lost.

The most recent thrust by the DoE is the requirement for all schools to embrace what is termed Learning Technologies. This is the implementation of computer technology into all areas of the curriculum. Schools have been advised that this must be done. As a member of the Science and Technology Course Advice writing teams, we were made aware of this requirement before it came to schools. Activities written had to include some computer application, and some of the earlier technology draft material had to be rewritten to include computer learning methods (Personal communication, Leonie Stott, 25 February 1997). Again our school curriculum has to be revised to include computer aided learning - somewhat difficult with limited numbers of computers in each classroom. In 1998, there was much debate between the Federal Minister for Education, Dr. Kemp, and the State Ministers for Education. A survey commissioned by the Federal Government found that literacy amongst Australians was very poor. Figures released stated that one in three people were not at the correct literary standard. Kemp accused the states of not educating people adequately. The Ministers for Education in all states disagreed with the findings of the survey. Barbara Kamer, an Associate Professor in language and literacy education at Deakin University, cited official data from the Australian Bureau of Statistics which indicated that there was no major change in literacy levels in the past twenty-two years (Ashdown, C. 1998). Professor Peter Hill of Victoria’s Centre for Applied Research, while disagreeing with the Federal Governments figures, believed that more time needed to be spent on literacy. He also stated that schools had to deal with ‘many extra educational projects’. However, after further discussions which revolved around the allocations of Federal Government funding for the states, most state authorities agreed to nation wide testing to ascertain if
students came up to literacy and numeracy benchmarks. These ‘tests’ were implemented in Victoria in August 1999 as part of the LAPs tests.

**Teacher and Community Perspectives**

*Teacher commenting:*

...workload of teachers has increased dramatically and that many were finding difficult to fit everything in.

**Issues with relevance for this thesis are:**

The benefits of LAP are yet to be seen. Teacher time and energy wasted.

Concentration on Learning Technologies is unsupported with resources or sufficient teacher professional development.

Crowded curriculum.

Teacher workload.

### 2.8.2 Assessment and Reporting

Another factor which is cutting into the time required to prepare lessons, and therefore practice, are the more stringent accountability requirements. Teachers have always assessed their students using a variety of methods, but in an attempt to meet the requirement of the DoE, teachers are having to spend more time on assessing and reporting on smaller portions of the curricula. All assessments have to be supported with documentation as teachers can now be held accountable if they are incorrect.

KIDMAP, a computing package designed to assist in program development and recording, has had so many glitches that many do not wish to persist with it. It also requires many hours of a teacher’s own time to become familiar with its basic properties, let alone the more complex ones. It has been ‘pushed’ by the DoE since its inception in 1995. However, few teachers I know around the Geelong area truly make use of it for assessment and reporting. Possibly if it had not been introduced at the same time as the CSF, when teachers were struggling to come to terms with yet another change, it may have been more readily accepted.
In the past four years, in an attempt to meet DoE guidelines, our school has changed the written report to parents at least three times. At the moment, we are trying to find a report format which suits the DoE, parents and teachers. Each time the report format has been altered, it has required extra work on the part of all teachers, time which is taken away from their preparation time. It should be noted here that teachers generally spend well in excess of the two and a half hours allotted to them in preparation. Historically, extra preparation has been done over lunchtimes, recesses and at home. It is these other times which are lost to preparation because teachers now have myriad other tasks to complete.

Although our school, like many others, has moved to computerised reports, which should be easier, they are so long (six pages) that each student report takes upwards of an hour and a half to write. When you add to that the time required to print out each report (approximately five minutes per report), it starts becoming a very time consuming task. Support was offered this year by the principal. Each teacher was given an hour off to assist with the writing of the reports and an office assistant was employed to print out each report. A forty-two hour job was reduced by about three hours.

Issues with relevance for this thesis are:
Accountability requirements reduce preparation time.

2.8.3. Classroom Numbers

The issue of increased classroom numbers has been discussed earlier in this chapter. However, it needs to be mentioned in reference to teaching practice. With larger numbers of students in the classroom, it is obvious that there will be less time given on a one-to-one basis. Add to this the physical restrictions of a full classroom, and some of the inventiveness goes out of lessons. Previously, with twenty-five students in a room, it was possible to leave a small area to be used for plays, action learning, role playing or small group work. The physical restriction of the crowded classroom means that the grade has to seek an empty room elsewhere in the school. This is limited by timetables for that room. It also limits the freedom to improvise, or 'go with the flow' with some
lessons. The other factor associated with a crowded classroom is the increase in noise. Again, while not a huge problem, it does affect the way a teacher runs a lesson. Classroom management must be exercised more fully, often to the detriment of the natural flow of the lesson. Teachers are becoming more automatic with their teaching or have to accept a higher level of noise than was once previously acceptable.

Issues with relevance for this thesis are:
High classroom numbers impact on the style and freedom of teaching.

2.8.4. Teachers’ Practical Response to Changes

Teaching workload is a constant factor in determining teaching practice. Some of the causes of increased workload have been noted earlier. What does this actually mean to teaching practice? With increased workload in curriculum areas, assessment and reporting, program budgets, and other administrative loads, many teachers find that they are working automatically when it comes to classroom practice. There has been an increased reliance on commercially available black line master books which specify that if the whole book is used, then the teacher would have covered the entire CSF requirement for that level. Those who have attempted to address the CSF work enthusiastically through specific lessons, but rely on their teaching experience to see them through other lessons. It is interesting to note that over the last few years in Geelong, the emphasis in professional development has closely followed the DoE requirements. As teachers attempt to implement these new directions, professional development (PD) has mirrored these needs. In 1995 and 1996, the main thrust was KIDMAP and the CSF documents. Professional development sessions called ‘Teaching and Learning’ were geared to using the CSF - essentially they were hands-on sessions on using the documents. In 1997, the emphasis was changed to assessment and reporting, again because the DoE specified that reports had to be in terms of CSF guidelines. Frantically teachers tried to come to grips with this after spending the previous year trying to assimilate the changes to the curricula. New teaching strategies, including practice, have arisen from the DoE itself. Initiatives such as Early Years Literacy (Keys to Life), Turning the Tide, Moderation and Consistency in Assessment and Reporting,
Early Years Numeracy, Middle Years of Schooling, Set for Success (science in schools), LOTE, Bright Futures (gifted children) and Learning Technologies have all been spearheaded by the DoE. There has not been much time for teachers to look at other educational research into teaching practice.

**Issues with relevance for this thesis are:**

Complexity and number of changes become overwhelming.
No time for Professional Development outside DoE initiatives.
Reliance on 'easy' teaching methods.

*Teacher and Community Perspectives*

*One teacher commented:*

...many people have at least three lunchtimes where they're committed through the week and preparation time at lunchtime is gone as well.

*The staff member commented that yard duty and lunchtime meetings account for at least 2-3 hours of staff free time which once would have been used for preparation. Additional comments were made about the inability to replace a specialist teacher for several weeks which meant some staff missed out on some of their approved preparation time.***

*Other comments related to the crowded curriculum:*

_I think we have a very difficult job as primary teachers...I think the quality of what you are presenting is better if you can concentrate on a couple of areas, which I'm inclined to do anyway...I feel its impossible to give all those areas the concentration that they need._

**Issues with relevance for this thesis are:**

Loss of traditional preparation time over lunch recess breaks, extra meetings - workload.
Specialist staff difficult to replace.
Crowded curriculum.

**2.9 ISSUES AND RESEARCH QUESTIONS ARISING**

Throughout the chapter, many issues were raised as contestations within the text and from comments by teachers and community members. Many of these workplace issues overlap or are interrelated in some way. All affect the teaching climate in schools.
They have been raised here at the first point of contact because they provide the context within which my science teaching takes place. They will be discussed in greater detail later in chapter seven. They have been summarised here into four main overarching issues:

- increased workload,
- changed power relations;
- changes in curriculum and teaching role; and
- changed security/morale.

With the number and type of changes occurring in Victoria’s education, several research questions become relevant:

- Having identified the substantive changes that are occurring in education, how does a teacher adjust her teaching practice to accommodate these changes?
- What effect does this context of change have on the teaching of science?
- What constitutes a quality program, particularly with reference to science? How is this quality measured?
- How can I apply this knowledge to my own science teaching?

With these issues clarified, I will be able to answer the overall question of:

How do primary teachers develop and teach a quality science program in light of the structural and policy changes that are occurring in Victorian education?
CHAPTER THREE

SCIENCE EDUCATION IN A STATE OF CHANGE

In this chapter I will focus on the policy and conceptual development of science education as a particular strand of school education in Victoria. As Constructivism is a dominant discourse, I will provide a background to research on Constructivist theory and give some reasoning for its inclusion in this action research project. Further issues which arise from this literature review will be explored and further questions developed.

3.1 RECENT HISTORY

Science education, like other fields of endeavour, has changed over the last thirty-plus years. Originally, science was taught following the rigid and static syllabi of the previous decades (Dow, 1971, p25). Any ‘new’ material was introduced at tertiary level, and the secondary science course remained unaffected by more recent advances. School science consisted of a basically historical exposition of topics within traditionally accepted areas. Because certain areas of science developed in a particular way, it was assumed that this was the best way to teach the scientific content (Bell, 1993, p7). Primary school science was less structured with ‘Nature Study’ being the area that most children were exposed to. A study of science in primary schools in the 1950s showed that science played a very small part in the school curriculum (Dow, 1971, p53).

Previewing the history which gives rise to current practices, and in this instance, current curricula, is always important so that past events can be placed in perspective and so that future decisions can be made with an awareness of previous judgements.

3.1.1 Process Science Theories

Another factor influenced the way science curricula was written and implemented. The popularity of science as a subject with senior students was noticeably declining in
England and some European countries (Dow, 1971, p1). Similar trends were noticed in all Australian states in the 1960s. Investigations into the cause of the decline indicated that there was no simple answer. It was thought that the course content was too dry, and did not appeal in its relevance to students. Also to be considered was the time tabling of individual subjects which led to specialisation in particular areas before students were ready for it (Dow, 1971, p6). Many students chose biology as their science option because time tabling constraints did not allow them to take one of the other science subjects. The course content was changed to incorporate many of the newer developments in science (technology was not considered a separate area of study in those times). Similarly, the content was placed more 'in reality'. Rather than 'prove Boyle's Law', the experiment became 'see if a relationship exists between pressure and volume'. The links between the disciplines became more pronounced, and the relationship between the areas of biology, chemistry, physics and mathematics became more developed (Dow, 1971, p29).

One of the guiding themes which ran through most of the curricula developed during the late 1960s was 'teaching science as enquiry'. Enquiry learning is defined differently by different people, but is generally understood to mean learning by discovery. In science, synonymous statements are 'teaching scientific method' and 'the process approach to science teaching'. This 'enquiry' approach was defined:

The basis of science is enquiry: the biologist seeks to understand the living world. In so seeking, he must recognise and attempt to solve problems arising from observations: to do this, hypotheses are set up and tested experimentally: results may lead to confirmation or modification of the hypotheses or the setting up of new ones.

(Biological Science - The Web of Life, 1967, p7)

Whilst this was the underlying theme behind content and teaching methodology, other course writers took into account other views. Nobel Prize physicist, Professor Rabi, stated that science should be taught with historical, philosophical, social and human understandings (Dow, 1971, p45). There was a clear swing away from dogmatic teaching, the sectioning of information into packages and the emphasis on memorisation of facts.
Some teachers still supported the 'old' way and believed the statement of Ausubel, an educational psychologist, who said the 'any science curriculum worthy of the name must be concerned with the systematic presentation of an organized body of knowledge as an explicit end in itself' (in Dow, 1971, p45).

With the strong background I have in science methodology and the 'scientific method', it is understandable that the initial primary science curriculum planned in 1989 reflects this background. How it has changed over the years since then will be an indication of other factors which have influenced my decisions concerning the curriculum.

3.2 PRIMARY SCHOOL SCIENCE

3.2.1 Course Content

Primary school science has undergone other changes over the last thirty to forty years. Science has generally been integrated into the curriculum often under the umbrella of health, geography and nature study (renamed natural science). Its main emphasis was on the observation and description of the events and phenomena that children saw around them (Ellyard, 1965). Sometimes science was brought into the classroom with the collection of small animals and the study of their life and habits.

In 1965, schools began using 'Fun with Natural Science' (Ellyard, 1965), a student workbook which looked at natural phenomena ranging from animals to magnetism. It was an arrangement of topics through which children could progress at their own pace, with some activities needing to be completed at home. Some of the activities were truly just that, activities or experiments requiring the children's participation. Others were just sheets of information for the students to write on. Little or no credit was given to children's previous experiences, although if the books were followed through sequentially, many activities built on the previous year's work.
At the national level, a series of six books called 'Primary Science Course for Australia' (Martin, 1965) was introduced to cover the basic concepts deemed necessary in the first six years of school. Again the booklets were student books which needed no external input and relied on children reading the content and answering questions, similar to a comprehension exercise. Each booklet was complete in itself. The course was said to 'conform with the modern approach presented by the latest syllabus' (Martin, 1965, Introductory Comments). An appraisal of the books indicates that an enquiry approach philosophy guided the book titles, but not the actuality of the children's experiences. The skills that the six books ostensibly used were: observing; inquiring; finding out; exploring; experimenting; and recording. Again, these skills were paper skills only, as most of the practical work consisted of a description of a simple experiment and given results. The children did not physically participate in any practical work.

With the changes that occurred towards the end of the 1960s, topics that included the physical sciences were being introduced into the classrooms of some teachers. The Education Department of Victoria introduced 'Curriculum Guide - Primary Science' in 1968. It was different from the previous set of books in that it was a guide for teachers, rather than a workbook for students. It also looked at a wider range of scientific investigations from classification and change in the junior years to matter, energy and life in the senior years of primary school. This series of three booklets (A, B, & C) was based on the enquiry approach to science and linked several important ideas. It advocated the process of observation and enquiry, and the using of children's direct experiences. It encouraged the expressions of children's ideas and the interaction of group learning as a stimulant to 'scientific thinking'. The emphasis in the Guide was on 'sensory experience, close observation, planning activities, carrying out the activities, measuring and graphing, organizing information, and language' (Education Department of Victoria, 1968, p10). It also supported the blending of several different science topics at the same time and the integration of science within other curriculum areas. As a set of guidelines, it was excellent for teachers who had no science background themselves.
Following this series of books, another set was produced in 1981 (Science in the primary school) which was again a curriculum guide for teachers. It was segmented into different levels and progressed sequentially across the primary school. Apart from the two curriculum guides (P-3 and 4-6) there were three other volumes. One was a complete index, one explained the philosophy of the guides, and one listed available resources around Victoria.

In the foreword it stated that:

Science activities in the primary school are concerned with assisting children to develop skills, attitudes, and concepts which will help them to investigate, understand, and live in harmony with their environment.

(Science in the primary school - Providing for Inquiry, 1981)

The concept areas that were covered were; Matter, Energy, Life, Time, Change, and Relationships. The latter three topics were new to the course content of primary science. This was also the first set of guides which indicated the environment and the interaction between the environment and living things. Earlier courses dealt with the environment in a static manner - there to observe only. As a set of course guidelines, these were excellent in helping teachers plan and implement a program in science.

In 1987, yet another set of science guidelines was implemented (Curriculum Frameworks P-10). The single biggest change was that science was linked to society and technology. Science was not seen just as a series of inquiry experiences, but as a human activity inextricably bound to our society and culture. The principles of constructivism were introduced in these guidelines as ‘children’s science’ and promoted the idea that children ‘bring their perceptions and beliefs to the learning situation’ (The Science Frameworks P-10, 1987, p30).

Science teaching should identify, begin from, and build on the strategies, interests, beliefs and explanations that children bring to the classroom.

(The Science Frameworks P-10, 1987, p30)

Technology was promoted as the application of science to solve everyday problems. Although there was a separate Technologies Studies Framework (1988) document, the
interrelationship between science and technology was recognised by the inclusion of technology within the Science Frameworks. The study of the environment was included within the science curriculum where it was presented as the knowledge and management of our environment and the management of Earth’s resources. Curriculum Frameworks P-10 (Education Department of Victoria, 1985-87) also attempted to plan the curriculum from preparatory year through to year ten. The transition from primary science to secondary science would not be a huge change in direction or content. These guidelines were an excellent set of notes and ideas for teachers to access and were in use in schools from 1985 until about 1994.

In 1988, the Federal Minister for Employment, Education and Training foreshadowed the introduction of a national curriculum (Ellerton & Clements, 1994, p24). The National Curriculum Statements and Profiles were developed over the next few years. Based on the premise that economic restructuring would be strengthened by a different approach in education, outcomes based education was introduced in these National Curriculum Statements. Ellerton and Clements (1994, p25) stated:

Clearly there was a heightening national consciousness of the need to use Australian schools as instruments for achieving a better economic order.

The measurement of learning ‘outputs’ (read outcomes) was seen as a means of assessing student achievement. Despite philosophical arguments about the basis of outcomes based education within the National Curriculum Statements, they were developed and states were expected to use them.

The Victorian government refused to accept the National Curriculum statements and undertook a major review process. The final result was a set of curriculum guidelines called the Curriculum and Standards Frameworks (CSF) which were heavily based on the national curriculum documents. The CSF aims not only to provide guidelines but also to set basic levels of attainment. Technology has been totally separated from science as it is regarded as a curriculum area in its own right. Environmental studies have also been removed and placed with Studies of Society and the Environment. The
science content and processes are divided into four main strands which exist from the prep year curriculum through to year ten. These are: Natural and processed materials; The physical world; Earth and beyond; and Life and living. There are seven levels across the CSF which cover the eleven years of learning. For each level and sub level, there is a learning outcome statement which indicates what students should be able to do at the completion of each level. Although the CSF guidelines had been in formation for nearly two years, support documentation, such as the Course Advice, was not available for a further two years.

In summary, the trend over the years has initially been towards an enquiry based learning style in most areas of science. This trend has shifted slightly, away from enquiry learning to constructivism and toward a more defined curriculum which designates environmental studies and technology to different areas, and embraces the requirement of 'successful outcomes' for students.

*Issue: Outcomes based education, constructivism and enquiry based learning - which one (or combination) leads to the best learning situation for the student?*

### 3.2.2 Teacher Training

The problem that existed then, and still exists in the 1990s, is the lack of specific training for primary teachers in the area of science. Very few primary teachers in Australia have studied science past a few years in their own secondary education (Ginns & Watters, 1995). This is a damning indictment on a system which recognised this lack of specific training back in the latter years of the 1960s (Dow, 1971, p89). An analysis undertaken by Ginns and Watters (1995) of pre service primary school teachers in Queensland, found that the majority had misunderstandings in the area of science concepts. Most had not studied science past middle secondary school. With their own misunderstandings of the concepts of science, it was argued that they would be unlikely to be able to assist students with the correct conceptual development. A similar study undertaken by Stofflet (1994) also found the same results, that student teachers come to education training with preconceptions which need to be corrected for that teacher to be
able to effectively teach the concepts of science. Stofflett (1994) found that, although
the trainee teachers were reluctant to alter their preconceptions, they were prepared to do
so after viewing the results of the study. This implies that in order to correct the
alternative concepts primary teachers have, first they must recognise this fact and be
willing and able to adjust their conceptual ideas.

*Issue: the persistent problem of student teachers being inadequately
trained to teach science.*

3.3 CONSTRUCTIVISM

The most conspicuous psychological influence on curriculum
thinking in science since 1980 has been the constructivist view of
learning.

(Fensham, 1992, p801).

The belief that students come to new learning situations with prior knowledge is the
basis of a ‘common epistemological assumption’ known as the constructivist approach
(Wandersee, Mintzes & Novak, 1994, p191). In the opinion of Watts (1994, p51),
constructivist learning is ‘always an interpretive process involving individual’s
constructions of meaning relating to specific occurrences and phenomena.’ Over the
last fifteen years, many strategies have been presented which are aimed at assisting
students gain a scientifically acceptable understanding of the concepts underpinning
natural phenomena (Wandersee et al, 1994, p191). Some of these strategies are only
loosely based on constructivist ideas, but many of the more recent approaches are based
on a serious appraisal of constructivism and seek to refine the approach (Duit, 1995,
p1).

3.3.1 Personal Constructs

During the early 1980s, three different aspects emerged as part of the constructivism
approach (Solomon, 1994, p7). The first of these, but by no means the newest, was that
of personal constructs. In the early nineteen seventies, Salmon and Bannister (1974, in
Solomon, 1994, p7) adapted the work of psychologist George Kelly (1955, in Solomon,
1994, p7) into the field of education. Kelly's studies indicated that every person viewed the world from a different perspective, testing out new constructions against his or her own experience (Solomon, 1994, p7). There has been particular interest shown by science educators and psychologists in how, when, why and where people come to build, and understand science concepts (Furnham, 1992, p29). Kelly stated that he did not believe it was possible for one person to completely understand another person's constructs of a situation. From the teaching point of view this implied a huge problem - how to guide children's learning with only a limited understanding of their previous concepts. Duit (1995, p3) described constructs or concepts as 'mental representations or as characterisations of descriptions which reflect the relationship of that person within world situations.' The process of changing those existing concepts, he felt, was dependent on many interrelated variables. From the point of view of teaching, his suggestion was for students to develop new concepts within specific contexts.

Salmon and Bannister (1974, in Solomon, 1994, p7) also looking at constructivism from the aspect of personal constructs, suggested that a totally non-prescriptive approach be taken in education. While there continues to be much debate in the area of the acquisition and processing of personal concepts (Furnham, 1992, p31), Novak specified eight axioms which would be endorsed by most researchers in this field. These are:

1. Concepts (scientific and social) are acquired very early in life.
2. Misconceptions are acquired early and are resistant to change.
4. Information capacity is inevitably limited.
5. Most scientific knowledge is stored hierarchically.
6. Learners are seldom conscious of their cognitive processes.
7. Epistemological commitments (or cognitive styles) of students influence learning.
8. Thinking, feeling and acting are integrated.

(Novak, 1988, cited in Furnham, 1992, p31)
3.3.2 Children’s Science

The second of the approaches had much in common with ‘personal constructs’ (Solomon, 1994, p7). Because of the recognition of children’s cognitive development as being pertinent to their learning, Osborne, Bell and Gilbert in 1983, started to look at what children know and understand of scientific concepts (Bell, 1993, p19). Their results led to the coining of the term ‘children's science’. Essentially what they argued was that children constructed their own ideas of science based on previous experiences. Each time a child revisited that concept, modifications were made to the child’s understanding. Often the child’s understandings were not what the teacher had expected the child to gain from the science information. Obviously, to guide the learning outcomes to the normally accepted views requires a knowledge of the alternative concept the child has developed, or, at least knowledge of the child’s previous experiences. The teacher needed to build on existing concepts, sometimes destroying previously held ideas, sometimes just modifying them.

As far back as the mid-sixties, an investigation into learning in England by the Nuffield Foundation found that young children had formed their own concepts or ideas of the world around them, even prior to coming to school (Wastnedge, 1967, p16). The suggestion from the Foundation was that schools needed to extend the range of experience for children so that the concepts became more refined. It also advocated a very practical approach to scientific investigation.

I hear it and I forget,  
I see it and I remember  
I do it and I know  

(Wildin, 1964, inside cover).

3.3.3 Social and Linguistic Factors

The third and final of these directions, emerging from the constructivist research, was that of the social and linguistic factors which influence the way students perceive and understand a situation or handle new knowledge (Solomon, J. 1994, p7). An example of this exists across countries where different meanings in different languages may cause
misconceptions. At the national level, within one language, the everyday understanding of a word may be totally different to its scientific meaning. As children are exposed to the scientific context, their own everyday knowledge of the meaning of a word may cause problems with understanding within the new context. As part of the constructivist view of learning, it was apparent that when students, teachers and others exchanged views there could exist multiple meanings for the one word. Driver and Easley (in Solomon, 1994, p8) suggested that this could indicate a strategy for learning - the use of small discussion groups which would tease out the various connotations or understandings of the same word or concept.

Often children's 'theories' stem from alternative concepts (Bell, 1993, p23). Subsequent practical experience does not necessarily modify or alter this, rather the child can accept both pieces of information (Bell, 1993, p18). Each 'concept' is seen to relate to a specific set of circumstances, that is, it is contextual and unique. Without specific knowledge of the child's previous experiences, the teacher cannot be sure that the 'right' conclusions are being drawn. This is probably the biggest single piece of knowledge that ams all teachers in their attempts to improve children's learning. Many of the science curricula being drawn up in current times are based on the Constructivist theory. Gunstone in a summary of research into 'children's science' stated that the view of children's science could be summarised in two statements:

Learners have ideas and beliefs and attitudes about their world which are personal constructions.

These personal constructions have major impact on science learning through their being the context the learner uses to:

(i) interpret (and, perhaps, reject) the ideas to be learned, and
(ii) link ideas to be learned with what is already known and believed.

(Gunstone, 1990, p13)

White and Gunstone (1989) argue that the beliefs that students hold about learning/teaching processes can also affect the outcomes of learning opportunities. For students to be successful, they need to recognise their existing ideas, evaluate them and decide whether they want to reconstruct them given new information. From the initial understandings of constructivism, it has been evident that students' alternative concepts
are persistent, and attempts to link them with known scientific concepts have not always been successful (Solomon, 1994, p10). There have been recommendations for studying children’s ideas before attempting to introduce formal teaching, but the practicality of being able to change students’ own conceptions is still being investigated (Solomon, 1994, p11). Desautels comments that:

...taking account of the learners’ prior knowledge in designing proper teaching strategies is a problem much more complex than it was thought to be twenty years ago.

(Desautels, 1994, p97)

Teaching and learning form the social interactions of student-teacher and student-student. In the former interaction, a power structure exists which asks students to accept what the teacher is saying, possibly to disregard alternative concepts. In the student-student interchange, whilst there may be a power base, it is likely to be less and have less influence on the need to change in order to please another. In both cases, there is a need for direct or indirect communication before ideas can be exchanged. How these are received and interpreted by the individual will depend on the prior constructs of that individual. Strike and Posner (1992, cited in Duit, 1995) also indicate the recognition of power structures concluding that ‘conceptual change must therefore be more dynamic and developmental, emphasising the shifting patterns of mutual influence between the various dynamic components of an evolving conceptual ecology.’

3.3.4 Constructivism - the practical application

Although research using constructivist principles has been the main focus in the last decade or so, some researchers are beginning to think that it has run its course (Solomon, 1994, p12; Matthews, 1994, p165). Many areas of research have raised more questions than they have answered and the complexity of teaching using constructivist practices has caused disillusion amongst some practising teachers. However despite the negative comments being expressed, many educational researchers continue to seek a satisfactory teaching practice using constructivist ideas as their foundation. Some of the implications for classroom practice have been noted by Krueger (1994) who imported constructivist learning strategies into a year ten class. A single mixed ability group of
thirty students at Immanuel Lutheran College, Queensland were involved in the revision of electrical concepts using constructivist learning strategies. He found that most students enjoyed the change, many felt that they had to think more, and one commented that she ‘was learning more thoroughly’. From the teacher’s viewpoint, he found that it took much more time to run the classes in this manner and felt that with current course syllabi, a teacher could not take a constructivist stance all the time. His recommendation was for less content in science syllabi.

In Victoria, a joint project (Learning In Primary Science - LIPS) was run by Deakin, Melbourne and Monash Universities and the Science Teachers’ Association of Victoria. The project’s aim was to develop teachers’ science discipline and knowledge, and to assist them in using the Science Curriculum and Standards Framework. Underlying this program were many of the principles of constructivism, such as exploring children’s ideas, activities based on using child-centred principles, and the treatment of children’s understandings as integral to the learning process. This project experienced success from the point of view of the participating teachers and the University researchers (Personal communication, R. Tytler, 1995).

The research on constructivism has influenced the way educationalists view the learning of science. You cannot just present material and expect it to be learned correctly. Students have to have their own concepts challenged, and suitable alternatives offered to allow their conceptual development:

...children should be changing their ideas towards those currently accepted by the scientific community so that they can make better sense of the way in which their world works....The intention is that the change is towards more scientifically acceptable concepts and understandings.

(Skamp, 1998, p5)

Since the earlier research, constructivism has taken on a much broader definition than that of alternative concepts or children’s science. It is now accepted by many as a ‘way of knowing’ (Skamp, 1998, p6, original emphasis). It is a theory about how knowledge
is generated through the construction of ideas to approach the most scientifically acceptable.

I find the principles of constructivism very interesting and believable due to my own experiences teaching science to primary school children. There have been occasions when, on questioning students, I have found instances of alternative concepts and even parallel concepts (in one set of circumstances, the concept is true, in another set of circumstances an alternative concept can be justified). The successes experienced by the LIPS team and others has encouraged me to try to introduce these in my own teaching practice. Over the past few years, as I have learnt about constructivism, I have slowly responded by trying a few new things. I tackled this in a more structured way via my action research project, discussed in a later chapter.

3.4 REFINING THE RESEARCH QUESTIONS

With the number and type of changes occurring in Victoria’s education, and in the science education field in particular, several research questions are relevant:

- Having identified the substantive changes that are occurring in education, how does a teacher adjust her teaching practice to accommodate these changes?

- What effect does this context of change have on the teaching of science?

- What constitutes a quality program, particularly with reference to science? How is this quality measured? Outcomes based education, constructivism and enquiry based learning - which one (or combination) leads to the best learning situation for the student?

- How can I apply this knowledge to my own science teaching?

With these issues clarified, I will be able to answer the overall question of:

How do primary teachers develop and teach a quality science program in light of the structural and policy changes which are occurring in Victorian education?
CHAPTER FOUR

METHODOLOGY FOR SCIENCE EDUCATION IN A STATE OF CHANGE

Where thoughts come from, whence meaning, remains a mystery. The page does not write itself, but by finding, for analysis, the right ambiance, the right moment, by reading and rereading the accounts, by deep thinking, then understanding creeps forward and your page is printed.

(Stake, 1995, p73)

4.1 INTRODUCTION

I had moved into the field of education from what I believed to be a successful career in science. I had worked for over seventeen years in various science institutions, at different levels of responsibility and endeavor. Throughout this time, the standard I was trying to reproduce was that commonly known as 'the scientific method'. This I understood to be totally objective, totally unbiased research which resulted in totally indisputable results. I saw myself as a logical person who could separate the personal, subjective biases from the decisions I was making at the professional and personal levels. When I decided to undertake research on my science teaching practice, I immediately assumed that I would be able to complete some form of statistical analysis of a prescribed set of circumstances. I had studied action research in my postgraduate degree and wanted to apply this 'scientifically' to my own teaching practice. It was with this notion that I approached my supervisor.

Fortunately and with some measure of insight, my supervisor did not attempt to dissuade me. Had he tried, I probably would have given up my attempt at further studies. Rather he suggested that before making a decision, I should look at a range of recognised research methodologies.
4.2 CHANGING MY VIEWS

I started off by studying the history of research methodologies over the last fifty years. To guide my approach to this study, my supervisor actually gave me an assignment from one of the undergraduate courses to complete. This tended to target my reading material and gave me specific questions to answer. It was a good way to start because it gave me something to focus on and a range of references to look up. At the completion of this assignment I was much more aware of the range of research approaches available to me and started to appreciate the limitations of the approach I had chosen. I was still unwilling to give up on the idea of including some form of ‘hard’ data. However, I was willing to concede that perhaps using case study and action research would be the best approach.

I found it difficult to reconcile the development of thinking about empiricist research. For me, empiricism had always emphasised the controlled observation and subsequent objective result of research. It could be used to predict future events. I had always assumed that scientific knowledge was impersonal and objective. Connole (1990, p48) supported this view by stating that in the empiricist approach, the position of the observer is one of independence from observation. Other researchers, Freeman and Jones (1987, p3), indicate that in the empiricist’s view it is possible for an epistemological separation to exist between the researcher and the object or subject of the research. Empiricism asserts that ‘either our concepts or our knowledge are, wholly or partly, based on experience through the senses and introspection’ (Lacey, 1976, cited in Phillips, 1987). It was at this point in my readings that my understandings started to alter. Krathwohl (1985, p26) stated that in social science settings, it is not just the observation that is the difficulty, but the interpretation of meaning is difficult when relating to internal values. This made a lot of sense to me. I could see how the act of observation is itself subjective, and how the objects of the study could be also. I started to realise that for studying social settings which abound with people’s values, ideas and expectations, an empiricist methodology was not the best approach.
It was a perplexing time, trying to come to grips with new concepts. In some ways it was made more difficult by my personal situation. My husband, a teacher, was once a scientist also. I tried to explain these fledgling thoughts to him, but as a true empiricist, he would have none of it. I still did not have a firm enough understanding to be able to persuade him to change his views. Every few years, I take up the challenge and by dint of repetition, or possibly because my arguments are becoming stronger, I am slowly changing his understandings. On the other side, my supervisor was becoming stronger with his persuasions. While not forcing his opinions on me, he was providing me with additional references which supported the interpretive, naturalistic research approaches.

I would like to describe a situation which occurred early on in my studies, about three months after I started. A visiting researcher came to Deakin to discuss research approaches and because I thought it would assist me, I took time off work to attend his presentation. I found him extremely difficult to understand, and while concentrating furiously for several hours, I took copious notes to review later, even though I didn’t understand much of what I had written. Many of the terms he used were foreign to me, certainly some of the concepts were totally new, and his rate of delivery was aimed at a much more cognisant audience than me. After the session, I felt that I had wasted my afternoon, but relegated it to the field of ‘experience’. Several years later, while cleaning up my files, I came across the notes that I had written that day. I was stunned. Much to my amazement I could understand everything I had written. Not only did the notes make sense, but they added to my knowledge of the field of post-structural approaches. It gave me a great deal of satisfaction to realise that I had in fact made significant progress in my understandings. It was a very positive experience for me and gave me inspiration at other times when I felt that I had somehow reached a plateau in my studies. I realised that even when my focus on my studies were not necessarily sharp, that as long as I kept working, I would benefit in the long term.

My transition to the acceptance of interpretive, naturalistic approaches was not a simple, easy one. However, the length of time it took to convert me and the huge volume of literature I read, meant that I felt very comfortable with the approaches I had chosen. I
decided to undertake a collaborative action research project on my science teaching practice while developing a case study of my school, the context of the project.

4.3 SELECTION OF THE METHODOLOGIES OF THIS STUDY

4.3.1 Beginning of Researcher’s Story

When I first thought of looking at my science teaching practice, it was from the practical point of view of trying to improve it. I had envisaged the need to study my current practice, to work out what improvements could be made and to make them. This turned out to be a rather simplistic view. Within a short time of reading literature about science teaching practice, my ideas of how I should teach were starting to alter, based on the information I was gaining from previous researchers. I found myself influenced by the principles of constructivist theory with the result that I wanted to try to incorporate its ideas in the way I taught science. I commenced this in a small way, but other factors now came into play. With the change in staffing numbers, I was suddenly placed into a classroom and had to consider whether I could even teach science as a specialist area. Overcoming the problems arising from this really meant that I did not have time to review and change my science teaching practice. Other issues ensued. The Ministry of Education (now Department of Education - DoE) introduced new curriculum standards. My first priority was to review what I was teaching in light of this curriculum - not how I was teaching. Over the last six years, my science teaching practice has dramatically decreased from teaching all grades (seven grades for one hour each) to only taking one grade. It is obvious from comments made by other staff that science has taken a lower priority due to the other pressures imposed on teachers.

The newest dilemma I faced was one of curriculum. Should I work with the Curriculum and Standards Framework, or should I teach my own program developed over the previous six years? How I actually taught was the centre point of the action research, however each new imposition from the DoE impinged on my time to critically reflect on my practice. Already the continually changing situation within schools and in my school in particular indicated the need for a research methodology which would be
flexible and structured to take into account the fluctuating circumstances surrounding education.

According to Rob Walker, a leading international exponent of case study, if there is a good ‘fit’ between the research problem/application and case study methodology, then that is sufficient reason for choosing it as the methodology (Personal communication, July 1995). The questions posed by this research project lent themselves to case study methodology, particularly using participatory action research as part of the study. I used participatory action research on my own teaching practice. I also enlisted the aid of several other teachers, some on site at school and others at another school nearby. To develop the context within which my research sits, I have used a case study approach relating to the school, staff and other influencing factors.

In the last fifteen years, teachers have started to pursue their own classroom research:

'These teachers are ‘normal teachers’, who reflect on their practice to strengthen and develop its positive features.... These teachers have not only carried out development work for their schools but have broadened their knowledge and their professional competency.

(Altrichter, Posch & Somekh, 1993, p5)

This growing research movement (if we can ambitiously call it a movement), is giving credence to teachers’ experiential knowledge and understandings. It offers the possibility for teachers to gain knowledge on aspects of teaching that interest them. The dissemination of the research findings offers other teachers knowledge grounded in actual practice.

'Teacher researchers are close to the situation and can actually watch it unravel; they generate hypotheses as they go and then make inferences when they see how things turn out. Most conventional researchers, even fanatics of participant observation, do not enjoy these conditions.

(Huberman, 1996, p132)
4.3.2 Case Study

The complexity of the social situation within Victorian schools is indicated not only by the changes that teachers are faced with, but how they deal with those changes which are affecting the entire school community. There is a microcosm of attitudes, beliefs and aspirations within the macrocosm of the wider community. As well as the social factors, there have been changes to the structure of education. There has been a shift towards a curriculum standard for the state, which although similar in some instances to previous frameworks, is completely different in its ideology. In particular, the main idea behind the Curriculum and Standards Frameworks is that of accountability. Apart from prescribing the curricula, the CSFs describe outcomes against which all students must be measured. These structural changes also included a devolution of responsibility for administration to the school community. This is yet another area of increased involvement for the teacher. School staff and community have learned to deal with these changes in order to remain a viable school environment. This mix of pressures has been felt differently by different groups and in different contexts, necessitating a form of research that is sensitive to these constraints and opportunities. In any study which is so intricately bound to human response, the recognition of social dynamics is essential. Within the time frame of this study, the focus of the study had to be altered several times in line with the varying situational dynamics of the main school and its staff. McTaggart (1987, p7) states that case study 'is sensitive to particular contexts' and 'could provide a better knowledge of educational phenomena in general'. McTaggart (1987, p7) also claims that case study research is as efficient as experimental methodology but avoids the artificiality which is often created in experiments. It enables replication, and the establishment of 'domains of generalisation of phenomena' (McTaggart, 1987, p8).

Because case study methodology allows for the changing dynamics of the classroom and social settings, any change in teaching practice can be accommodated and incorporated in the study. This has already become necessary as the dilemmas of teaching science have altered from a question of professional choice to the dictums of a standard curriculum.
There are several alleged disadvantages of case study methodology as noted by Hawkins (1985). Due to its seating in a dynamic social setting, it is very difficult to generalise from one case study to a larger, similar population. This would be a disadvantage if I had wished to extrapolate results from this study to infer what might occur in a larger sample or population, however I did not. The very elements of case study research which make it ideal for single situation analysis, also preclude the extension of results from one setting to another. However, in the current project this is not a problem as it has not been necessary to look at a larger population - the imperative in my research is personal professional development as a teacher of science.

Another difficulty occurs if previously collected data are used in a more current situation. This can lead to the distortion of information if it is taken out of context. As this study was unique in its settings, and the research is current, retrospective data have not been used.

Another problem with case study methodology is the collection and organisation of data. Bearing in mind the data collection procedures mentioned earlier, I have monitored and organised data to keep the research project viable and valid. At the practical level, this means not only tape-recording interviews, but also writing down my impressions of the interview as soon after the event as possible. Symbolic clues (such as stance, body language, tone of voice, facial expressions) are also important in determining the meaning of what people say. Noting these at the time of recording the interview aids its interpretation. With documentation, it is important to clearly mark its source, and verify its validity using another source if possible. This creates the single biggest problem with case study methodology - its accumulation of data. This means that the preparation, interpretation, and subsequent writing of results becomes a huge task (Walker, 1985, p45).

Ethical considerations are extremely important when dealing with people and socially sensitive material. The research project was undertaken with complete confidentiality guaranteed to any participants or institutions. Although Adelman et al. (1976, p7) note
that this reduces the validity of the research findings by distorting the report, they also state that ‘even so, the price may be worth paying’. A participant, protected by terms of confidentiality, is more likely to act or speak freely and truthfully. The researcher, aware of the possibility of distortion, can improve the situation by increasing the quantity and variety of descriptions. Adelman et al. (1976) also support this method of ‘illustration’.

4.3.3 Action Research as Critical Self-reflection

Action research is simply 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.

(Carr and Kemmis, 1983, p162)

The present project has adopted a mix of case study on the contextual elements and action research on my own professional practice as a teacher. Action research is a cyclic process of planning, implementing, monitoring, reflecting and replanning. Ebbutt (in Burgess, 1985, p156) defines action research as:

the systematic study of attempts to change and improve educational practice by groups of participants by means of their own practical actions and means of their own reflection upon the effect of those actions.

This research project has offered me the opportunity to review my teaching practice by discussion with others, and by using the documentation collected during the research. In education, most teachers actively seek to study and improve some aspect of their classroom teaching practice. Action research projects give teachers the opportunity to do this using a legitimately recognised form of methodology. Action research, undertaken this way, is a form of critical educational science. Or rather, action research is one vehicle for undertaking critical educational research.

Thus, a critical educational science has the aim of transforming education; it is directed at educational change.

(Carr & Kemmis, 1983, p156, original emphasis)
This was precisely what I wanted. I wanted to participate in research on my own practice with the view of transforming it - to improve it, to make it better than it was. Carr and Kemmis (1983, p156) state this quite succinctly when they say:

...critical educational science is not research on or about education, it is research in and for education.

(original emphasis)

To transform my practice requires me to collaborate in the organisation of the methods and means to this end, to make decisions on how this transformation can come about and to continually critically analyse the situation as it arises. In the past, external researchers have been involved in all these areas, but as the teacher-researcher, all of these tasks now become mine. As stated by Carr and Kemmis (1983, p159):

...these are the tasks primarily for the participants in educational situations who, by their practices, construct and constitute these situations as educational, transform them by transforming their own practices, and live with the consequences of the transformations they make.

Using action research as the means to critically evaluate my teaching practice, I recognise that action research will involve me in three areas of improvement.

...firstly, the improvement of a practice; secondly, the improvement of the understanding of the practice by its practitioners; and thirdly, the improvement of the situation in which the practice takes place.

(Carr & Kemmis, 1983, p165, original emphasis)

In more recent times, action research has increasingly involved the wider educational community, the parents and students (Kemmis & Stake, 1988, p65). Many researchers (Connole, Smith & Wiseman, 1990, p262) have extended the original idea of Lewin’s cycle into a spiral of phases. They include the dynamics of interpersonal and political interpretations, and increase each spiral from the individual, to small group, to whole group, to school personnel and researcher. Herbert Altrichter, Peter Posch and Bridget Somekh (1993, p7) have proposed four stages of action research.
A  Finding a starting point.
B  Clarifying the situation.
C  Developing action strategies and putting them into practice.
D  Making teachers' knowledge public.

The participating teachers were given the opportunity to assess the material themselves and to reflect on their own practices. It is possible that these teachers may wish to change their teaching practice or may have already done so without conscious effort. Flexibility had to be allowed in the research methodology to accommodate for possible changes to the outcomes of this aspect of the research.

Reflecting back on the issues raised in chapters two and three it can be seen that case study was the right methodology to use when studying the contextual elements of Victorian education, my school, and the seating of my teaching practice. However, to actually investigate how to change my teaching practice, I needed to be reflective. I needed to set up circumstances that allow for critical observation and discussion. I needed to adopt an action research style of project with myself as teacher-researcher and enlist the aid of others as collaborative, critical friends.

Armed with the data and knowledge gained from these two overlapping methodologies, I will be able to respond to the question:

> How do primary teachers develop and teach a quality science program in light of the structural and policy changes which are occurring in Victorian education?

### 4.4 METHODS

In this section I wish to move from a consideration of methodology to the more specific data collection methods I used in the study.
4.4.1 Observation

Observation was a major method for generating data. I needed to record any observations by detailing them at the time or shortly thereafter. For most interviews, tape recordings were used, and in the instance of non-taped comments, these were written down as soon as practicable after the event. However, an underlying danger was the subjectivity of my personal perceptions. By including observations of the same event from other involved sources, I have been able to minimise these biases and focus more accurately on the real issues. Hawkins (1985) indicates that the creative use of bias can lead to the discovery of material previously hidden. As indicated below, the development of the use of a journal and a diary gave rise to the ability to record observations as they happened. Interviews and questionnaires formed the other points of support for, or contradiction of, my observations.

4.4.2 Interviews

Both formal and informal interviews have been conducted with a range of participants. Walker (1980, p56) supports the use of an unstructured interview in which the researcher can probe the intensity of an individual’s feelings, the complexity of the person’s interpretations and how it relates to other aspects of that person’s life. In short, the researcher can gain real perspective into what may be complex situations. Walker (1980, p56) however warns against the interviewer ‘leading’ the interview along preconceived lines or allowing the researcher’s values to influence the interview. The aim of this type of interview is to obtain information which cannot be presumed. In all interview instances, I used an informal structure. The interviewee was given the broad focus of the discussion in advance so that he or she could think about it before the interview. During the interview, I would allow the participant to comment and occasionally raise specific questions to clarify an issue or to direct the conversation. I did not want my biases to influence the responses of the interviewees, although I am aware that this would still have occurred to some extent with people who know me well.
4.4.3 Questionnaires

Questionnaires have been used to assist in highlighting the participants' perceptions of science. MacDonald (1993) stated that they have limited use in short term research projects where interview techniques would elicit more information. However, I decided to use questionnaires because I believe that they play an important role in longer studies. Whilst offered against a changing social environment, the questionnaire could delineate a continuance or change in perceptions at the personal level. This line of thought is supported by Walker (1985, p49) who suggests that questionnaires are useful for directly comparing groups or individuals. An added benefit is that the recipients are given time to think carefully about their responses, and questions can be targeted to elicit specific information.

The usefulness of a questionnaire depends principally on the quality of the question, as follow-up questions are possible only in a limited way, if at all.

(Altichter, Posch & Somekh 1993, p111)

Questionnaires can consist of closed or open questions. Closed questions require a specific response, informants choose an answer that applies to him or her. Open questions require the respondent to formulate his/her own answers. The questionnaires used in this research project made use of open questions. This required, in some cases, a more difficult and time consuming analysis, but tended to give me a more complete picture. The advantages of questionnaires are listed:

- they are easy to distribute;
- they need not take much time to complete;
- a large number of individuals can answer the questions simultaneously;
- the impersonal nature of the questionnaire and the possibility of answering anonymously make it easier to be completely honest;
- the social pressure on respondents is not as strong as it is in an interview, which makes it easier for respondents to reflect on the questions before answering.

(Altichter, Posch & Somekh 1993, p113)
Of course, there are disadvantages of using questionnaires as well. Some of these relate to the composition of the questions. For example, is there any form of ambiguity? Other disadvantages relate to the subjectivity of the respondent, often unknown factors to the researcher. For example, attitudes and emotions which are closely linked to self image, may lead to unintentional distortion of answers (Altrichter, Posch & Somekh 1993, p114). I kept these factors in mind when I designed the questionnaire I used.

4.4.4 Diary Writing and Journal Writing

Many people think and use these terms synonymously. However, within the practical application of this thesis, I have chosen to delineate the terms in the following manner. Diary writing relates specifically to the writing within the action research project undertaken in 1998. This covers the chronological writing-up of the practical sessions and any impressions, understandings and reflections gained through this. The journal writing was undertaken over a much greater span of time and chronicles the events occurring within the school, my relationships with other teachers and students, my feelings and emotions tied up within certain events (school & home). This has informed some of the case study background.

There were several reasons for choosing both journal and diary writing for this research project. Initially, I started the journal due to the insistence of my supervisor who wisely saw the problems I could face if not supported by an ongoing background document. I started reluctantly, not sure of what to write, what to include and what to leave out. Soon I began to see the benefits of keeping the journal. According to Noffke & Stevenson (1995, p125) journals are 'useful for keeping records of procedures, discoveries, problems and questions'. The journal became the means for allowing the research to be both reflective and flexible. Altrichter, Posch & Somekh (1993, p11) advocate that 'The research diary is one of the most important research methods...'

They offer a list of characteristics indicating the usefulness of diaries.

Diaries:

- are simpler to use and more familiar than other research methods;
- can contain data from other research methods;
show developmental progress, links activitics and makes apparent both successful and unsuccessful aspects of learning through frequent submissions; draw on tradition allowing for observation and reflection on current and past experiences; and are accepted qualitative research tools.
(paraphrased from Altrichter, Posch & Somekh, 1993, p10 &11)

4.4.5 Triangulation

Burgess (1985) states that:

...many texts advocate that researchers should use a variety of methods alongside each other - an approach commonly referred to as ‘triangulation’ where multiple methods may be used.

Hargreaves (1985, p28) noted that the best way of negating the ‘political’ influences of information, or the variations which occur within the same situation, was to use a system of cross-referencing. Using different data for the same topic, or comparing different methods for the same situation will aid in the substantiation of the validity of the interpretations. The way this is achieved is to collect other forms of documents (students’ work, diary notes, curriculum guidelines et cetera) and compile them to act as the third point of investigation (interviews and observation being the other two points of triangulation). This allows a much fuller description of events and one which relates more closely to the actuality of the events than a single, probably biased account.

Adelman, Jenkins and Kemmis (1976, p6) indicated that the use of triangulation responded ‘to the multiplicity of perspectives present in a social situation.’ The data are analysed in the context of other pieces of information. Burgess (1984, p267, 1985, p13) also commented on the use of different types of information, stating that data gathered by the use of multiple strategies can be sensitive to people’s lived experiences. Observation (my journal and diary), interviews and questionnaires were the three points of my triangulation and ensured that what has been termed ‘hit and run’ research was avoided. Collection of other supporting documentation added even more validity to my discussions.
4.5 CONCLUSION

Earlier in this thesis, I outlined the changes that were occurring in the Victorian Education system. The complexity of the changing social situation and how teachers deal with those changes, the introduced structural changes such as the CSF, all contribute to a dynamic mix of pressures. Never static, ever evolving, the education context over the last few years has continued to change. This has led me to adopting a case study approach. I needed the flexibility to be able to deal with ongoing change. Despite alleged difficulties such as the inappropriate extrapolation of one situation to another, ethical considerations and the collection and storage of data, case study was still the method of choice.

The action research component of my thesis was adopted because I needed a form of reflective analysis which would lead to improvement in my own science teaching. As an ongoing study using critical ‘friends’, action research with its cyclic elements of reflection, inquiry and improvement was the method chosen. I wanted to be responsive to the information I was gaining and I wanted to develop my teaching practice rather than just review it.

This research project has used case study and action research methodologies to probe and enquire into the status of science education in two different settings. It did not set out to compare and contrast, rather the reader/audience will be able to draw whatever conclusions are relevant to them. At my school, the case study included an action research component. At the second school, the teachers involved were called upon to discuss my approach to science education and to assist in the formulation of different approaches.
CHAPTER FIVE

A PRIMARY SCHOOL IN A STATE OF CHANGE

In this framework, I will present the historical context of the school and staff. The changes in staffing, the power structures and staff relationships will be investigated. Here I will include a discussion on the impact of the external changes of policy and structure on the contextual elements of the school. Other stories from individuals in the field will be presented.

5.1 HISTORICAL CONTEXT OF MAXWELL PRIMARY SCHOOL

Maxwell (pseudonym) Primary School was built in 1876 and was officially opened in 1877. The original building was constructed of brick with blue stone foundations and a slate roof. It had eight rooms and housed about two hundred students, most of whom came from the nearby St. James Schoolhouse (which closed as the State School was established). It continued like this until 1919 when extensive remodelling provided extra playgrounds and a caretaker’s cottage. Additional land was also purchased to the west of the original site.

In 1936, a Junior School was built but by 1952 there was overcrowding, so another room had to be added onto the newer building. Further renovations were undertaken in the late 1960s, and improvements were continued into the 1970s when a watering system, a library block, two classrooms, an art-craft room and improved staff and pupil facilities were all completed.

In the early 1990s the school underwent extensive cyclic maintenance which included repairs, repainting and new ceilings in some areas of the school. The old caretaker’s cottage and a vacant block of land owned by the school were both sold and some of the proceeds used to purchase a smaller extension of land in the south-eastern corner. In the mid 1990s, the playground was remodelled with an adventure playground and a huge sheltered sandpit being added to the existing play area.
Currently the school consists of three main buildings, a canteen and a separate toilet block. The main building, downstairs, houses the principal’s office, the administration office, the staff room, a resource room, staff toilets, a medical room, an art-craft room and a classroom. Upstairs are three rooms - two classrooms and a room used for Reading Recovery. The upstairs music room and a Social Integration Unit (SIU, which also provided a base for the one of the Geelong Computer consultants) were lost to increasing student numbers and the SIU closure at the start of 1999. The Middle School building has four classrooms, one with a small storeroom, and a wet preparation area. The Junior School has a large and extensive library which houses a small learning technology laboratory and two classrooms separated by a small withdrawal room which can be opened up to extend one classroom into the other. There is also a storeroom and a wet preparation area. These classrooms have a separate outside courtyard area with its own sand pit exclusive to the younger students.

Externally the school has large play areas which include two basketball/netball courts. There is an adventure playground adjacent to which is a native garden walk area. There is a grassed passive play area plus a large oval for other games and play. There are two smaller bitumen areas for play and a courtyard near the library. The school oval is surrounded by large gum trees and other shade trees are peppered throughout the grounds. In one spot is an old oak tree sitting among a wood chip area which the children have named ‘wood chip island’. The school grounds are excellent for students’ games and provide a range of environments for all types of play.

Although enrolments dropped in the 1980s, there has been a resurgence of popularity and the school now boasts over two hundred students. The school just managed to keep ahead of the 1993 school closures. At one stage we had just one pupil above the 'closure' figure of one hundred and seventy five students. The school population hasn't really felt secure since the start of closures five years ago. When the last closures occurred at the end of 1996 we were warned that the next round of closures would target schools with enrolments of two hundred students or less. We have been frantically trying to build up our reputation so that we could attract enough students and free ourselves of the constant worry of closure.
5.2 STAFFING AND STAFFING CHANGES

When I arrived at the school in 1989, there were about one hundred and forty-six students spread over seven grades, an average of twenty-one students per grade. There was a principal, two specialist teachers, of whom I was one, and seven classroom teachers - a total of ten teaching staff and one part-time administrative person. With a student population of one hundred and ninety-six in 1998, our allocation of staff is 9.6 teaching staff and one part-time administrative person. Although the school has increased its student numbers significantly, the staffing ratios have been drastically altered in the last few years, giving us considerably less staff than we were once entitled to.

In 1992, we had 12.5 teaching staff (one more than our entitlement) for a student body of 170. By 1993, our staff numbers had dropped to 9.0. Several staff were moved to other schools, and still we were over the limit. The two specialist staff at the school had to accept an 'over-entitlement' classification of a 0.1 time fraction. This really meant that they would be unlikely to be moved to another school and could remain where they were. I was one of those teachers. Although the school continued to grow, our staffing allocation did not seem to be as flexible as our student numbers.

When I first arrived at the school, to take on the position of specialist science teacher, the principal was a friendly but conservative person who arrived at school at 7.30 am to water the gardens and do the maintenance. Most staff had been at the school for many years, the minimum being about five years, the maximum being about fifteen. Teaching staff were a little entrenched. Over the next few years, there was some movement in and out of the school amongst both administrative and teaching staff.

At the commencement of my study in 1993, the staff at the school were as follows: six classroom teachers, two specialist teachers, one principal (acting), one part-time (0.6) administrative person. The principal was very supportive of the specialist programs for several reasons. One reason is that specialist programs attracted students to the school. Parents vetted schools very closely and were interested in the whole educational experience for students. They expected to see a range of programs offered to their children.
and actively sought schools which offered more. Another reason the principal supported the specialist programs was to supply teachers with preparation time, thereby decreasing external preparation time and increasing morale. Finally, the programs themselves were an excellent learning experience for the children. The areas the specialist programs addressed were art, library, physical education and science. All areas could perhaps be taken by the classroom teacher, but not without considerably more preparation time and expertise than many had.

With the cut in teacher numbers and the alteration of the student/staff ratios, our grades were starting to increase in size. One of the staff members in the junior school became quite dominant in her views and influenced other teachers around her. She had held positions of high responsibility in other schools and seemed to be able to gather a group of socially interactive teachers around her. This in itself was a good thing as she was able to help others relax and offered help in many areas of school management. Initially, she and I became very good friends. At some stage later in our relationship her attitude towards me altered. Despite repeated attempts on my part to clarify the problems she became an adversary. She opposed the continuation of science as a specialist area and maintained that classroom teachers could and would teach a quality science program. It seemed that whenever discussion ensued around science, she was able to influence others into believing that the school would be better off without science as a specialist area.

In 1994, with a change in principal, the discussion of specialist staff was raised once again. The principal, ostensibly trying to give staff their preferences, allowed staff to determine whether class sizes were to be kept smaller or whether teachers retained their preparation time. This also effected the specialist programs. With a vote of 6 to 5, Library and Art were retained, although the teacher was ‘in excess’ by a 0.5 time fraction. Science and PE had to go, so I was placed into a class.

Throughout 1994 and 1995, due to the fact that we had a teacher ‘in excess’, our school did not receive any money for replacement staff if teachers were ill. Classes had to be split up and teachers were allocated an extra four or five students for the day.
Throughout 1995, I attempted to continue to take science as a specialist subject by swapping with other class teachers. To make it a little simpler, I gave the same lesson to the upper two grades and a different lesson to the lower grades, reducing the preparation time by half. It was still extremely difficult as there was very little official time release this year, and certainly no extra for science. Towards the end of 1995, I applied to the school council to provide funds in 1996 to support science by providing teacher cover for me to be released from class. The school council were very supportive, providing sufficient money for one day's worth of science each week, enough for the upper four grades. The junior school leader was still adamant that science was not needed in her area, so I did not attempt to cover the lower grades.

There was still a lot of friction within the school. Unfortunately, the clique of teachers was still very vocal and seemed to be able to influence many decisions around the school. There were different hostile discussions at times. Recently, while talking to a teacher since retired, I learned that in that year (1996) several members of the clique did not speak directly to her after she had argued with them. She was essentially ostracised by this group within the school. At the end of that year she resigned. In retrospect, I believe the tense and unfriendly atmosphere within the school was more than she could cope with.

During 1997, we had several changes of principal and other staff changes. The person who had dominated the junior school group took sick leave and then resigned. It was interesting to watch the changing dynamics of the school as people had to reposition themselves with new staff and a new principal. The old clique no longer existed. People became more friendly with each other and more tolerant. Some attempted to pick up the leadership of the clique, but it did not work. After many years of disharmony, teachers started to work together again. There were other staff changes in 1998 and 1999, but these have generally not effected the harmony of the school. People are prepared to work for the good of the school and the students.
5.3 A CROSS-CHECK: EFFECTS OF CHANGES AT ANOTHER SCHOOL

Another local primary school tackled their science program in a completely different way to ours. Like most schools, they relied on the classroom teacher to undertake science in her class. With the completion of the National Curriculum Profiles in 1992, and a major school review scheduled for 1993, Russell (pseudonym) Primary School undertook a whole school review and analysis of their school science program. This was spearheaded by some committed staff, but due to it being a whole school focus, all teachers were involved.

Initially, the Review Coordinator completed a synopsis of the objectives of the National Curriculum Statements in Science and presented these to staff on a set curriculum day. The staff drafted a policy statement as there was no science policy currently in existence at the school. All staff stated what science they did, what they felt comfortable with, what could be done with the equipment available and then trialed some lessons. This process took several months to complete. The following year, an outline program was developed using the trialed lessons. With SOSE and technology, science was integrated into a packaged unit. Unit headings from the science curriculum statement and the SOSE curriculum statements were used as broad theme areas around which to build the package. The finished product was a whole school integrated package of themes, involving specific science lesson plans. The staff enthusiastically embraced the integrated package using it fully immediately after its development. However, when the next review area came into play, many staff struggled to keep up. Subsequent discussions with staff indicate that this integrated package has been effectively ‘lost’ as other DoE initiatives have taken priority and the school has had to concentrate on implementing those. Recently the Junior school had purchased a literacy based program called Insights which has a science/technology base. This is used extensively to teach from and provides the basis of the science the students receive within the classroom. The teacher believes that very little science is taught elsewhere in the school. Certainly, the supporting documentation to provide evidence that teachers are undertaking science is not forthcoming.
The school was also badly affected by staff losses in 1993-1996. Presently, for a student body of two hundred, they have eight classroom teachers, one specialist teacher, one part-time LOTE teacher and the principal. Over the last five years, they have had to manipulate their staffing to cover all the schools necessities. There is very little flexibility in the school structure - no spare money or staff to supplement PD or other school/DoE initiatives. With only one specialist, teachers only receive two hours preparation time a week. This has been a negotiated loss so that class sizes remain low. However, it is an infringement of the Teachers' Award, and weakens the case for other teachers fighting to retain conditions. Teachers at this school should not have to give up their preparation time to achieve smaller classes.

The effects of the SOF, CSF and other structural and policy changes on the school appear to be similar to that of other schools. Some teachers have resisted each and every change which has been brought in. Some teachers, those in promotional positions, have not only embraced the changes, but have become fanatical about them. However, most teachers, realising the inevitability of changes, attempt to implement what they have to, when they have to, with the minimum of effort and in the most effective way possible.

5.4 STORIES FROM THE FIELD - AMIDST THE CHANGES

I have included three stories from the field - all from enthusiastic teachers who wanted to include science as part of their curriculum. The stories are generalistic, not necessarily concentrating on their science teaching practice, but rather giving an overview of other teachers’ lives in education.

5.4.1 Roxanne’s Story

Roxanne became a teacher in 1975, and apart from a stint of six years maternity leave, has been teaching ever since. Initially, Roxanne was a specialist Art teacher and enjoyed five years in this role. With the changing dynamics of her school situation, Roxanne was made a generalist classroom teacher. She enjoys this role and is not
interested in returning to specialist teaching. Roxanne is an active teacher, one of those who always puts maximum effort into her work. Her interest in teaching science stemmed from this desire to improve. Over the years, she recognised that teaching science was not an area of strength for her. Deciding that she needed to improve, she made the effort to research science teaching (informally) and to try different things until she was more comfortable in what she taught. There has been a slow evolution in her science teaching practice. She believes that now she is a capable teacher who displays a great interest in science, is able to stimulate students and, most importantly, works around the children’s needs and interests.

Roxanne participates in many aspects of school life. Because of her high interest level, she is involved in curriculum development in the areas of mathematics, SOSE, science, technology and literacy. Laughingly, she admits that she really does not like to deal with computer studies or PE. Again, due to her high activity level within the school she is also the Welfare Coordinator. She laments the fact that the PD budget does not have sufficient funds to allow her to undertake the training necessary to fulfill this role adequately.

A few years ago, Roxanne held a Leading Teacher Two (LT2) position, as did several other teachers at her school. This was originally a contracted position, however the contract had expired. The school retained the positions until it suddenly found itself without sufficient funds to last the year. Roxanne and the other LT staff had to take a cut in pay, a loss of self esteem but essentially continued with the level of responsibility they had undertaken at the start of the year. Roxanne was pragmatic about it. There was nothing she could do, so she accepted it.

Like many teachers in the region, Roxanne believes that she has about ten years left of teaching. She has no further ambition in terms of promotion. She would like to remain a classroom teacher and is happy at her present school under its present leadership. Her challenges come from the imposition of external changes and her self-directed learning. She strives to make her students’ learning her prime motivational factor. She is prepared to take on more responsibility, work harder and work longer if she can benefit
her students. Although there are aspects of the school which she may not entirely agree with, such as its creative accounting and inflexible time-tabling, she believes that the school leader is motivated in the students' best interests. Therefore, she is willing to accept less preparation time or to swap her preparation time around to attend meetings and she is prepared to work longer and harder.

When discussing all the changes that have occurred in schools, she can see both positive and negative aspects. She enjoys the specificity of the School Charter and its accountability features. She prefers the flexibility of the School Global Budget. She does not mind using the CSF documents, but declares that they are not prescriptive documents. She takes what she wants from them and disregards the rest. What really irks Roxanne is 'the continual push for schools to act like a business.' She believes too much in schools is now revenue driven. She abhors the constant drive to improve student numbers, to gain more staff and the need to make sacrifices in one area to gain in others. In her mind, schools cannot be like a business. Students cannot be considered 'products'. Each student has a unique social situation and cannot be considered part of a market enterprise.

Most of the staff at Roxanne's school have been there for many years and Roxanne believes that they have been somewhat isolated from many of the changes. This is in part due to their own lack of participation, but also to the fact that they are not necessarily part of the broader school community. Only some changes have had an impact at the personal level, those directly implemented by the school. However, they were all made much more aware recently. A staff member, on contract until the end of the year, had his contract terminated suddenly due to the unexpected return of the absent teacher. The contracted teacher had refused other positions believing that he was secure until Christmas. Suddenly he is without a job, no pay over the school holidays and is out searching for another contract. Many teachers who are secure in their permanent position niche, do not realise the negative aspects of contract teaching.

Roxanne openly discusses Schools of the Third Millennium (SOTM). She is opposed to it as she can see schools like her own being seriously disadvantaged by it. Her school
was once a recipient of the Disadvantaged Schools Policy (stopped in 1995/6). The students are still drawn from a similar background and the school population would be still considered disadvantaged. Under SOTM, Roxanne believes that her school would suffer inequities and be further disadvantaged. It is interesting to note that Roxanne’s school was once the only school in the district not to ask for voluntary fees from the parents. However, in 1998, after much heated discussion around the staff room table, it was decided to introduce voluntary levies as a means of raising funds for the school. As a member of the school council, Roxanne has been involved in discussions with the other members relating to SOTM. School councillors have attended information sessions run by the DoE. Whilst there has not been a formal vote on the issue, the outcome of the discussion was that SOTM is not an option for the school.

5.4.2 Marilon’s Story

Marilon is a teacher at my school. She has a diverse teaching background and has taught in three different countries, Canada, Scotland and Australia. Marilon has taught all grade levels and in different settings. She has worked at primary level, with special needs children, intellectually disabled children and with adolescents. Her teaching career is peppered with other life experiences. After completing her first teaching qualification in 1966, Marilon taught in Victoria for several years before moving to Canada for twelve months with her husband. After her teaching stint in Canada, Marilon took maternity leave to have her family. During this time, she upgraded her teaching qualification. Tragedy struck the young family, causing Marilon to rethink her career. She completed a nursing qualification and again upgraded her teaching qualification by studying special education. During these training periods she worked as a nurse in a general hospital and then in a special needs school.

Marilon has since moved back into mainstream school settings, and because of her qualifications, has held the integration teacher’s role. Her special interest in education, apart from special needs, has been in literacy, in particular the remediation of reading difficulties (this was part of her special education training).
When Marilon came to our school, it was on the basis of her strong literacy background. The principal who appointed her recognised that there was a need in the junior school for someone with her special skills. This immediately caused concern amongst the junior school clique and from her first day at our school, Marilon seemed to have antagonised this group. Like many of the other teachers, Marilon experienced their angst and nastiness. Fortunately, as mentioned earlier, the group was dis-empowered with the retirement of their leader.

Since her arrival at our school, Marilon has been a staunch supporter of the science program. With her own strong biological background and two of her sons in science professions, Marilon believes that science should be a natural part of the school curriculum and in junior school should be based firmly on the children’s interests. Marilon supports the idea of a specialist science teacher as she believes most teachers would otherwise not teach enough science, or teach a limited science program. While she believes that junior school teachers probably have sufficient background to take many aspects of science, she also believes that science requires so much specialist knowledge that most teachers would not have a sufficient background.

Marilon is due to retire in the next year or so. She has held an Advanced Skills Teacher (AST) promotional position, but relinquished it on transfer to our school. She felt the pressures of work were impinging on her home life. Marilon is happy in her role at Maxwell Primary School, where she is the Integration teacher and preparatory grade teacher.

Marilon is quite vocal when it comes to the changes that have occurred in schools over the last five years. She fully believes that, prior to all the changes, schools and teachers were doing an excellent job. She doesn’t see any real advantages in outcomes based curriculum guidelines and comments that the CSF strands do not always seem to be based on the interest areas of children. She expresses her concern that the SOF program, the CSF and other DoE initiatives have placed an incredible burden on teachers, principals and office staff. Her other objections relate to the fact that she believes that children are suffering by the altered focus of education. Because schools are being
driven by the need to increase their numbers, the focus of an individual school has shifted from the educational needs of the school to the revenue needs. Marilon cannot see the benefit of all the testing procedures introduced in schools, for example the Prep entry tests. However, she does support the extra money in literacy which has enabled our school to hire a Reading Recovery teacher. Marilon believes that these support structures should be readily available.

Marilon is also quite vocal when discussing SOTM. She believes it is the government's way of abdicating from their responsibility to schools. She does not see how it could benefit the majority of schools. All it would mean would be a school more firmly focussed on market initiatives, more school time taken with revenue raising ventures and for an unknown result. Philosophically, she is opposed to the introduction of SOTM on the basis that schools in poorer areas could end up much worse off. Marilon has very strong social justice views which she finds are at odds with the concept of SOTM. More of Marilon's views have been included throughout this document.

5.4.3 Leanne's Story

Leanne's story has been included here to give contrast to the other two. While Roxanne and Marilon are teachers with many years experience in the system, Leanne is a new teacher. While Roxanne and Marilon can offer opinions by way of contrasting the before and after of SOF, Leanne has only experienced one system and one setting. If anyone is to gain from the insights of this thesis, it will be teachers like Leanne who are looking for the answers on how to teach science and how to cope with all the demands and continual changes they are faced with.

Leanne came to our school in 1998 as a final year education student from Ballarat University. She came early in the year for a preliminary round with the Prep/One grade and returned towards the end of the year for a much more comprehensive teaching round, prior to graduating. She arrived back at Maxwell Primary School in October and was given lots of responsibility in the grade. She participated in the entire school's activities including staff meetings, special activities and excursions. She arrived in the
morning just after the classroom teacher and left late in the day. In all respects she
demonstrated exemplary skills for a trainee teacher.

Toward the end of her practical round, the DoE announced an incentive scheme to
facilitate the uptake of graduate teachers into schools. Assuming that with increased
revenue for literacy, most schools would be looking for extra staff, the DoE encouraged
schools to hire newly graduating teachers. Our principal, believing that our school
numbers would be increasing in the following year, decided to hire a new graduate.
There was some staff opposition as numbers are always an uncertainty at our school.
However, the overall decision was for reducing our class sizes and hiring an extra staff
member under the government’s scheme. As a sweetener for schools the DoE offered to
pay for the graduating teachers for the month of December so that they could be
integrated into the school and become familiar with other staff, children and the situa-
tion in general. Leanne was naturally considered, along with several other applicants.
Her position at the school gave her an advantage over other applicants and she was
subsequently hired. Leanne was delighted with her appointment, even though it was a
fixed term contract of only twelve months.

Over the month of December, Leanne was moved around to other classes to observe and
team teach with all staff. She was used in the capacity of a Casual Relief Teacher on
several occasions when staff were away. The Principal assumed the responsibility to
‘keep an eye on things’ when Leanne was in this situation. I had several talks with her,
as I could still remember my own start at school and the things I had to sort out in the
early days of teaching. I advised her to use her time in December to collect and prepare
as many resources as she possibly could. Lack of resources, or knowing just where to
find resources, was one of the things I found quite difficult. Planning activities on a
daily basis, with the confidence that you were covering the entire curriculum, was
another area in which I sought outside help. Fortunately, another teacher gave me a
copy of her previous year’s planner so that I had a model to copy and adapt. I gave this
model to Leanne for her to use in whatever way she wanted. Although much has
changed in the approach to curriculum, the basics have not changed all that much.
Other teachers also passed on information and resources for Leanne to use, and offered help.

Leanne was given a grade1/2, and the grade structure was considered so that she would not have any of the ‘troublesome’ children. The children were comfortable with her from her previous time at the school and of course, Leanne was very familiar with most of them.

Over the summer break, Leanne came into school on several occasions to organise her new classroom and have everything in readiness for the new year. Her classroom had been brightly decorated and looked ready, but there was an obvious lack of the basic resources like cover paper, pencils and sharpeners which most teachers build up over time.

The year started off with a major snag. The student supply of books, pencils, textas, and paper had not arrived by the first day of school. They still had not arrived three weeks later. I offered to share various resources with Leanne, as I am sure other staff did, but we were all rather short of supplies as well.

The first indication that all was not proceeding smoothly for Leanne was when she walked into the staff room and said jokingly that she was quitting. There was a tone in her voice that indicated to me that it was not totally a funny thing for her. I spoke to the Junior School Leader about Leanne and was told that she was finding things a little difficult. Not only was she trying to come to grips with her teaching load, but was trying to incorporate Early Years Literacy Strategies without sufficient experience and background in them. Even for the more experienced teachers, setting up learning centres and actually achieving a satisfactory teaching episode for the students was not an easy thing. Most teachers in the Junior School had reservations about that aspect of the Early Years strategies. Other things such as running records, matching children to text, etc., had been accepted without any qualms. Learning centres proved to be more difficult. I did not have a chance to speak to Leanne personally about her difficulties and I thought it might embarrass her if I did. Instead I gave her all the learning centre
material that I had developed over the previous year for her use until she had time to develop her own. Also, as PD coordinator, I approached the principal about using Professional Development funds to give Leanne some extra preparation time, above the normal two and a half hours. That is when I learned that the school had extra money ($2000) to support Leanne. The money had not been used, as the principal was still deliberating on how best to use it. I made a very strong recommendation that some of it should therefore be used to give Leanne extra preparation time, a recommendation which was taken up within the week.

At about this time, Marilon and Leanne approached me about running a rotational session with the three grades with Leanne taking one curriculum area, Marilon another and me taking science. I agreed in essence, but was very aware of overburdening Leanne at this time. I also considered that with my involvement in the Triennial Review, that I wouldn’t have much time either. We agreed to consider it for second term.

Since then, Leanne has continued to work diligently. She arrives at school at about eight in the morning and rarely leaves before five thirty at night. She has not been called on to handle any extra duties such as that of Program Budget Coordinator, although she did initially devise the yard-duty timetable at the start of the year. Leanne has suffered much illness this year, falling prey to every ‘bug’ at school. Whereas most teachers at our school would average about four days off sick each year, Leanne has doubled that, at least. The vitality and laughter that were Leanne’s call signature last year, have been toned down and we see a much more subdued (maybe exhausted) person this year.

On discussing aspects of change with Leanne, it is apparent that she only has a very limited understanding of them. Terms like Schools of the Future, Schools of the Third Millennium are just names to Leanne. While she is actually employed under the Schools of the Future program, Leanne does not understand its broader elements other than those which affect her directly. She has some understanding of what global budgeting means, and has experienced the Professional Recognition Program and the
Curriculum and Standards Frameworks first hand. She has no understanding of what the system was like previously and what changes have occurred. Consequently, Leanne is very accepting of all the changes which more experienced teachers rail against.

In talking about specific features of her teaching practice, Leanne has found it difficult to relate to the accountability aspects of the CSF. Although she was able to gauge what to teach the students, she found the specificity of the CSF difficult to apply to the assessment procedure. This is not due to lack of experience as many other teachers also have similar problems. However, experienced teachers are less likely to worry about this as they tend to rely more on their personal judgement.

When discussing the Annual Appraisal System wherein teachers specify particular ‘standards’ they wish to concentrate on for the year, Leanne thought that this was a very professional and positive thing to do. She felt that, particularly for beginning teachers, this was a good way to focus in on individual improvement. However, she did comment that for some teachers, who were self-motivated anyway, it probably was an unnecessary procedure. Leanne did not see any problems with linking the annual increment to the appraisal system. Leanne has had very little experience with the career path aspect of the PRP and whilst having direct experience with the contract system, she has been fortunate in the fact that she has only been exposed to positive experiences.

Leanne finished her comments by saying that she found her first year of teaching much harder than she had expected and much more diverse than she had originally thought. She found that it was difficult to juggle all the demands on her time. Bearing in mind that the school did not give her any of the extra responsibilities that most teachers have to shoulder, then she will continue to find it difficult as she has to take on more of these. In her second year of teaching, she will be expected to take on her full share of additional tasks and will not be given any extra preparation time.
CHAPTER SIX

A SCIENCE CLASSROOM IN A STATE OF CHANGE: Action research study of my science teaching practice

This chapter is a description of the changes that have taken place over the last seven years and the influence of the structural/policy changes. It is a praxiological approach looking at relationships amongst policies, practice and context. In addition, I will be studying my teaching practice with regard the CSF and the principles of constructivism. This will form the action research part of the study. I will include interviews with other teachers who are presenting science in the classroom and analyse the direction of science education (both at the personal level and from the perspective of others).

6.1 THE RESEARCHER’S STORY

My teaching career began in 1989, a mere eleven years ago. Since that time, the Victorian education system has experienced some of the biggest philosophical and structural changes in its history. I would like to document those changes from the point of a practising teacher and to indicate their direct impact on my teaching experiences.

Firstly, a little history to place me into the scene. I came into teaching after many years as a laboratory technician and project scientist. I have worked for government laboratories mainly, with brief stints in a hospital and a school. It was when I worked in a school as a laboratory technician that my opinion of teachers altered. Like many people I had believed the old adage of ‘those who can, do, those who can’t, teach’. However, working in a school gave me new insight and an understanding and appreciation of the role of teachers.

It was during my year working as a project scientist that, due to personal reasons, I decided that I would have to re-train. Teaching seemed to be an option that would
accommodate my changing circumstances and allow me to enter a rewarding career. I could also still be involved in science, my real ‘love’.

My training, a two year post graduate B.Ed., allowed me to teach in both primary and secondary schools, although my initial inclination was to teach science in secondary schools. I registered with both systems and was offered a specialist position in a primary school. It seemed like an unusual situation - to teach science to primary aged children. It was different to what I had expected, but a challenge all the same. Because of the constraints of money, I could not afford to wait to see if another position would be offered. Even in 1989, the job market for new teachers was limited. Several of those who completed their qualifications with me had to wait months to be offered any positions. As it happened, within several hours of accepting the primary position, I was offered a job in a secondary school teaching science. Because I had already accepted, I felt I could not reverse my decision.

6.1.1 The Initial Years

I started enthusiastically. Initially I was searching for lessons to teach, and resources to use. The school really did not have much in the way of resources, even teacher reference texts were very scarce. For the older grades, I adapted some of the secondary science practical sessions and with the younger children, I started with simple nature study. It probably took me all of that first term to gain some insight into what level the children were at, what they responded to and how to actually teach science. I remember the Prep grade teacher laughing at me and saying that probably for the first three months, my language with the preps had been too technical; much of what I had explained they couldn’t understand because of the words I used.

Over the first term holidays, I pored over texts and put together a rough syllabus for the year. It was definitely trial and error that first year. I kept good lesson notes, jotting down what had worked and what had not. This was not easy to assess as I did not attempt to test students’ knowledge, rather their attitude and effort. At the end of that first year of teaching I was satisfied that I had made a contribution to the students’ learning.
Then came reality. I could not be guaranteed a position at the school for the following year! Staffing was decided during the first month back after the Christmas break and in a small school this meant that the last teacher taken into the school would be the first to be moved out. Also because I was taking a specialist area, not a classroom position, it was felt that these curriculum areas were more expendable. If it came to the crunch, then classroom teachers, being generalist teachers, would be expected to take science. After only one year at the school, I knew that only one other teacher had actively taken any science with her students. Had I known of the precarious nature of positions in primary schools, I may have waited until I could have secured a secondary position.

Despite the tenuous situation, over the annual break I reviewed the syllabus, refining it and looking for other things to replace what had not worked. Also I had to find yet another set of practical tasks which fitted into the selections of science made previously. The school ran composite classes and I did not want to double up on any lesson with any child.

Each lesson was made up of a brief discussion, about ten minutes to talk about the topic, followed by instructions (10mins) and the practical task (40mins). At the conclusion of the practical work, we would come together to discuss observations and results. At this time I was starting to work in themes, like forensic science, fossils, air, etc. I thoroughly enjoyed my teaching experiences. I was seeing children really ‘switched onto’ science and felt that I was achieving a measure of success, even if it was only in their improved attitudes to science. Over that second year of teaching science, I was continually refining my approach to the students and the manner in which I taught. As a relatively new teacher I was seeking new ideas and methods all the time. One teacher in particular seemed to have excellent teaching skills and was the only teacher who was actively exposing her students to science experiences when I arrived at the school. I used to speak to her as my mentor and she would offer suggestions which would help in different situations. Also this year I started teaching Physical Education (PE) without any previous experience in PE. Again I went back to the books and put together a
program. This added a different dimension to my teaching, creating variety and greater exposure to other schools.

6.1.2 Reality Strikes

The next year was a horror year for me! Owing to a small drop in student numbers, our school was no longer allowed two specialist teachers (myself and Art/Library teacher). I was put into a class situation. I was devastated. This was the first indication I had that science, or my teaching of it, was not held in the same esteem as the library/art program. School had been running for three weeks when suddenly I was told that I would have to take over the grade one within three days or be transferred to another school. There really was very little choice. I did not think that I would have any more chance of success in establishing science at a new school than re-establishing it later on at my present school. Several of the parents from the school went and visited the Regional Office to complain about the situation, stating that I was a valuable resource as a science teacher, and that they wanted the science program to continue. They continued this 'discussion' with the manager of Regional Officer for several weeks, bordering on harassment, but to no avail. I learnt another valuable lesson then. Although science was being pushed as a priority by the Department of Education, through the media and educational institutes, when it came to reality, no further money would be made available.

Although I had felt very confident as a teacher, working with a grade of twenty-nine young students with no direct classroom experience was very difficult. Over this year I tried to transfer into the secondary system. Apparently there were too many excess teachers in the Geelong region and a transfer was not supported. Several times over the year, I felt like giving up teaching. Being a classroom teacher in primary school was the last of my preferences for teaching. I did take science in my own grade but found that it was sporadic. It was hard to find the time to slot science in with all the other demands placed upon me. I tended to run science differently. Rather than be limited to an hour timeslot, I would take a theme or topic and allow it to run over several hours while we
investigated as much as possible. Then I might not have science again for another three weeks.

6.1.3 My Need for Self-Improvement

The next year I was placed back as a science specialist and I re-established my program. Although I was happy with what I was teaching, my year in the classroom had given me a better understanding of the rigours of teaching, of the need to accurately evaluate a child's progress, to keep comprehensive records of a child's abilities and to be more accountable. Again I reviewed what and how I was teaching. It was toward the end of this year that I started thinking about returning to study. I felt that I was unable to be critical enough of my own practice. I wanted some assistance.

Other factors came into play at about this time also. A new scaling of promotion had just entered the Education Department - Advanced Skills Teacher (1&2). Unfortunately a time period of ten years experience was needed before a teacher could even contemplate promotion. I had another six years to go. Interestingly enough, I was considered skilled enough to sit on the selection panels for these promotional positions. With the realisation that I had another six years before being eligible for promotion, I decided to look for a challenge in another direction. Hence my foray into doctoral studies.

I did not want the hassle of assignments and deadlines. I knew that working full time, I needed a flexible study plan. I contacted the university to enquire about Masters and Doctor of Philosophy (PhD) programs. I was told that without an honours year, I would have to complete a one year pre-masters study, like a mini thesis. I was not prepared to do that. I sought another way of entry. I really wanted to start a PhD but was told rather strongly by Deakin Admissions personnel that I would have no hope of that. That was sufficient to make me more determined than ever. I was given some information which indicated that if I could gain the support of an academic willing to supervise me, then I would have a strong chance of acceptance. Because my intended studies were in science, I approached a person who had been one of my lecturers and was involved in
the science area. He advocated that I would need to do the preliminary year. Rubbish!
So I approached another lecturer who was very supportive. He suggested that I might
be able to use my time as a project scientist to support my application, if it could be
couched in terms of a research study. I approached the Australian Animal Health
Laboratory where I had conducted my research and the Principal Scientist who had
supervised my project. He was able to assist and wrote a letter stating that the research I
had conducted was equivalent to a level 2A Honours degree. Armed with this, and the
support of a supervisor, I contacted the Dean of Education and spent several hours in his
company convincing him of my suitability as a candidate for the PhD program. He
eventually accepted on the basis that I would be enrolled in the masters program
initially, and could swap to the PhD program if I was making adequate progress. I was
in!

6.2 THE START OF CHANGE

Meanwhile at school, several changes were occurring. A new state government had
been elected into office at the end of 1992 and had promised major reforms in
education. As teachers, we could not envisage what they might be. All of us felt that
the present system worked very well, that students were achieving and that teachers
worked hard. How disillusioned we were. In 1993, Task Forces were set up to evaluate
schools with the distinct and definite message to close or merge schools (as described in
Chapter 2.2.1). Principals were placed in the invidious position of running the task
forces to evaluate other schools. Along with this was the rumour that small schools
were going to be closed. The rumour turned to reality as many schools in our area were
forced to merge or be closed. Our school only had about 170 students at this stage, and
schools with 150 or less were targeted. We felt very vulnerable as we all felt that this
was only the first round of closures.

There was a considerable amount of unrest in schools. Even though not threatened
directly, most teachers could see that the education system as it had been was now in for
massive changes. Nobody really knew what to expect. Staffing ratios were changed and
schools had to name teachers as ‘in excess’. These teachers were offered redundancy
packages to entice them to leave the teaching service. Teachers, having had job security for many years, felt very unhappy with the whole system. Although many were not directly affected by the staffing cuts, all felt sympathy and empathy for those who were. The morale of teachers was plummeting.

At our school, teaching numbers were stripped to the bone. Having enjoyed 11.5 teaching staff (one more than our entitlement) plus a principal position for 170 students, suddenly we were cut to 9.2 staff, including the principal. Several staff were moved to other schools, and still we were over the limit. I accepted a part ‘excess’ teacher classification which I felt would still allow me to teach science where I was and possibly, if shifted, would allow me to teach science at another school.

Meanwhile, through my studies at Deakin, I was starting to gain ideas of how I would like to change my teaching practice. I had been reading about Constructivist theory and about action research and decided that I would need to implement a pro-active course of action. However with all the changes going on around me, plus the academic reading to keep up with, I found that I just did not have the time. Possibly, if I had had more support from my colleagues I may have had the energy to take up another task. As it was, the atmosphere at school was very demoralising and I felt that I could not introduce anything else into my life.

It was at about this time that I started getting very negative comments from some of the other staff about the viability of science at the school. Teaching science, which is a heavily practical subject, allowed me time for preparation in excess of the classroom teachers. So they complained. They did not complain about the other specialist teacher, maybe because they had some understanding of the preparation time needed for art and library. However, they did not understand why I needed time to prepare for science. In my defence, I had only an hour more than them anyway (with two specialists, they received four hours time release per week). To overcome their negativity, I attempted to pick up more of the administrative tasks around the place.
At the end of 1993, amid the school closures and general tension in schools, I was dealt another minor blow. When grade sizes and structures were being discussed, one of the staff came out strongly in favour of dropping one of the specialist areas in an attempt to reduce class sizes. I could not understand this. In previous years class sizes had been mentioned, but most staff had opted to retain their preparation time. Now, apparently, the specialist programs were being devalued, to gain smaller class sizes. I was devastated as was the other specialist. Both of us felt that we were offering valuable educational programs to the students, but to have our colleagues dismiss them like this made us feel upset. I remember feeling sick in the stomach and angry that I did not have the support of my colleagues. (I had supported the industrial campaigns which brought in the AST classifications from which many had benefited). Fortunately, the principal decreed that both specialist programs were to remain. He felt that it was more important that teachers had time to prepare lessons and also seemed to value our programs. He also pointed out to staff that parents were now looking at what schools offered and that we were extremely well placed with the choices we offered. Without our specialist programs we could not offer parents anything different from other schools. So I had a reprieve.

During 1993, our school was considered to have half a teacher in excess because of our staffing numbers. Consequently, we did not receive any funding for replacement teachers if somebody was away ill. The staff devised a plan. If a teacher was away, then I would be placed in the classroom for the duration of their absence. Any classes I had would be cancelled and staff would miss out on that time release. If a second teacher was away, then the grade would be split up amongst the remaining classes. In the rare instance of a third teacher being away, then money would be taken from program budgets to replace the third teacher. Again it pointed out to me how little people valued science. The library/art program remained untouched.

6.2.1 New Principal, New Start?

At the start of 1994, we had a change of principal. The new person was definitely of the 'new' breed of principal, a Department of Education (DoE) man who saw his role
as a facilitator of change. With little knowledge of the school, staff or community he started making changes. He was prepared to bring the school in line with the sweeping changes that the DoE were introducing. Midway through 1994 while another teacher went on long service leave, I was placed in a classroom for two days a week. I kept up my science load and half of my PE load as well. Still there were complaints from several members of staff who felt that I had it too easy. By this time I was seriously worried about my relationships with these staff members and tried to have an informal chat with them to get to the bottom of the hostility. It appeared to be emanating from one person mainly and despite repeated attempts on my part to clarify things, I could not solve the problems. I started keeping more to myself and spoke at length to the other specialist staff member who sympathised with my position. She and others sensed the animosity directed at me, but could not understand it either. While in the classroom, I started to teach Japanese (using interactive satellite presentations) to two grades. My teaching load, while not unbearable, was very diverse and complicated.

At the end of the year when the discussion arose again about class sizes, the principal asked for a vote on the matter. With the numbers of 5/4 against specialist programs, I was offered the choice of a classroom, or to be placed in excess. Knowing that the situation was similar at other schools, I opted for the classroom. I was confident that I could come up with some plan for being able to teach science. The other specialist was not prepared for this eventuality. She was also in excess by 0.5. She was shattered by the apparent rejection of our programs by other staff who had opted for smaller classes. From that staff meeting on, she refused to speak to some of the staff who had instigated the changes and removed herself from the staffroom during recess and lunch. I also felt betrayed and felt very uncomfortable with other staff. I could see the bigger picture though and realised that it was the staffing cuts which had put us into this situation.

Over that summer vacation, the school council president wrote a letter of support of the science program which was sent to over 60 industries around Australia. The letter also asked for monetary support to continue the science program. About half the companies responded with a ‘Cannot help’, one sent five dollars donation, another offered a computer, and BHP offered to publish my science program as a teacher resource. There were no definite offers to allow me to continue with science teaching.
6.2.2 Classroom Teaching

This first year of teaching in middle school (1995) was quite simple. Despite less preparation time, I found that I was enjoying the classroom teaching duties and coping easily with the work load. I remember saying to the Art/Library teacher that classroom teaching was much simpler and required less energy than taking specialist areas. Maybe because this was not as difficult as I had expected, and because I still valued science so highly, I attempted to teach science in the upper school. I did this as a swap arrangement. While I was with other grades, teachers would come and take my grade for specific lessons. I found this really difficult over the year, because I was still trying to take science as a practical subject and preparation time had to be done during lunch and recess. Also, while two of the teachers took valuable lessons with my grade, one of the other teachers just did fill-in lessons. Although not worthless, they did not have the same value as covering a set curriculum area.

In other aspects, this was a year fraught with tension. The government was trying to change our set of working conditions, with our union fighting this in court. We no longer had the assurance of preparation time and although each teacher was scheduled for one and a half hours preparation time, it was rarely achieved. This was due in part to the staffing cuts, and to our school decisions. To keep numbers low in the junior school, most staff had voted for less preparation time. We were 0.5 teachers in excess, which meant that we were not allowed any money for emergency cover. If teachers were away, students were split amongst the rest of the grades. The principal did not have time to offer classroom support. The Library teacher was asked by other schools to move (in her 0.5 time fraction) but refused. She maintained that if forced, then she would resign rather than move. By mid year, she was finding the uncertainty of her teaching career untenable, so she took long service leave. She never returned to teaching. After long service leave she took three months off and then resigned. The stress of the situation was so great that it took her several years before she was even able to come back into the school premises again.
Because of the situation at school, I felt that I was just coping with science and did not have the time to start my action research on my practice. I did however start a small pilot project relating to the children and other teachers who were involved in my studies. I also had to prepare for my colloquium presentation. I found that with the writing I had to do and the pilot project, plus school life and home, I did not have the energy to do more.

After the colloquium, I had to refocus on what I wanted from this study. It took a while for those things to clarify. I had been thinking of my PhD in terms of improving my teaching practice. After two and a half years I still had not been able to concentrate on that aspect. I realised that this was really what my study was about - how to implement changes (to improve learning) amongst the constant top-down pressures from the DoE. It took me until early March to complete the revised document and another five months to be finally accepted into the PhD program.

6.2.3 Support versus Lack of Support

Of course it was not quiet at school either. I was still hoping to teach science across all grades and raised this issue at the end of the year with the principal. It was out of the question for me to be able to take up a specialist position, the money just wasn't available. I approached the school council, asking for additional funds to release me from the classroom one day a week so that I could continue with the science program, at least in part of the school. There was overwhelming support from the school council and funds were made available (the equivalent of 38 x 1 day per week). In one day, I could take four grades and have one hour of preparation and clean-up time.

The following year however there were only three grades in the middle-upper school which meant that I did not need the full five hours allotted. I only needed four hours. However, the principal was not happy for me to leave my class for this amount of time and reduced the time even more, allowing me three and a half hours for science. In an effort to compromise, I accepted the conditions and the residual money was spent on
giving other classes music. Most of the staff did not realise that the money for music was coming from the science budget.

About mid way through the year, it was found that some teachers still did not have their full time release. The money had to come from somewhere, so while I was in Melbourne at a conference, it was decided by the rest of the staff to cut my science time even more. Had I been at the meeting, I would have argued that the school council had given funds for the science program to continue and that perhaps this was a way of giving those teachers more time release. Instead the money was spent on increasing the music program. I was furious. I felt that the principal had not given the staff a true indication of the situation, and that he had acted unfairly in this matter. The staff who were to be given the time release were also those who had been making it difficult for me to continue with the science program by making complaints and destructive comments. Although I complained to the principal about the situation, I knew that nothing would change, so the best thing to do was to get on with the job.

Earlier in the year I had attended a meeting in Melbourne of primary teachers who had volunteered to help write course advice for science. When I had put my name down the year before, I had no idea of what it involved, or even what course advice was. It was interesting to meet teachers from all over the state who not only taught science, but valued it as greatly as I did. These Focus Group meetings, held once a term, became a great source of strength for me, particularly when science was being de-valued at school. When we met, we discussed the CSF in science and put together ‘tried and tested’ practicals sessions which would address the focus of the strand and in turn, the learning outcomes. I became very familiar with the CSF document in science and although I did not agree with the philosophy of the curriculum, felt that by assisting with the course advice, that I was helping other teachers come to grips with it. There was little point railing against the CSF; for the time it was here to stay and it was better to use it. I was also attending some professional development sessions on the implementation of the CSF and was gaining strong messages from DoE personnel and university educational researchers. Most advocated using the CSF as a framework only, not changing teaching practice, rather adjusting existing programs only if they did not
address the CSF focus statements (not the outcomes!). I could not get this across to staff! Although I spoke at a staff meeting about the CSF documents, most clung to the idea of having to be accountable to every CSF outcome in the book. Slowly, over time, I have made inroads into this thinking, but it has taken several years.

Although I had had my research proposal accepted, I still had not started the nitty gritty of it. I started to wonder if I would ever have time, if I was collecting enough data, whether what I was collecting was the right data and generally I was feeling a bit washed out. The only way for me to work through this was to start with what I could do, and to place fairly strong time constraints on various aspects of my work. I spent time with my supervisor, planning the basic outline structure of the final document, and decided to tackle those chapters which I could. Like everything, it took time just to structure the table of contents. I put together a time schedule which would see me start at least four of the chapters over the year 1997, getting two of them at least close to final stage. I dropped the plan off with my supervisor and started work. One of my close friends at school decided to retire which was a blow. She had acted as mentor for me in my earlier years of teaching and I had hoped to use her as a critical ‘friend’ in my action research studies. At about this time, I was approached by one of the DoE regional curriculum coordinators to see if I would be interested in taking over the role of Science KLA leader for the Geelong Nih District. I had been recommended by the retiring leader who knew of my interest and involvement in science. Initially, I was not sure if this would be a good move. It would mean more work. In the end I accepted as I saw it as another way I could help science to become more important in primary schools. I also believed that making contact with other teachers in the Geelong area might help me when gauging opinions on the changes in education.

It was the end of 1996, and there was a rather unpleasant incident at lunchtime with one teacher demanding to know why, with all the constraints placed upon schools, we were still running a science program, and why I was given extra preparation time for science. Because of the vigour of the attack and the nastiness of the tone of voice, I was taken aback and could not immediately answer in defence of myself and the science program. There was silence, momentarily, and then this teacher launched out again, repeating
what she had just said. I did my best to justify what was going on, but not one other staff member came to my support. I tried to remain calm and go through the reasons that the program had been supported by the school council and was funded by them, but obviously this explanation did not satisfy her. Several other staff members looked decidedly uncomfortable so I suggested that she take it up with the principal and I left the room. When I returned a few minutes later, it was obvious that a small group of staff were still discussing the issue with hostility, so I again left. The principal raised the issue at the next staff meeting and was supportive of me taking science under the current arrangement. When the aggressive staff member again raised her questions, she was told that it was a decision which had been made in the students’ and school’s best interests, and that she should not question it further. This did nothing to calm her down, or to stop the animosity presented to me by this small clique of staff. At the end of this year our principal was appointed to another school and the new ‘acting’ principal was a long-time colleague. I felt that I would be given some support for science.

1997, and I was back in the classroom. I had arranged to swap in and out of class to cover science in the upper three grades. Again the school council covered some of my time, but at a greatly reduced rate. In light of the ill feeling, I had asked for the bare minimum of time. I had been working on my PhD, and felt that in some respects, I was getting my life under control. I decided not to push the issue of science, but to just go along as best I could. I did not feel that I had the support to tackle any more. There was a new staff member at school, and within a short time she had provoked the animosity of this ‘other’ group. I was not the only target of their barbed comments and nasty looks. In sympathy, I tried to offer as much support as I could and it was not long before she became a staunch supporter of my science program. As a person whose son was completing a PhD, whose sister had just completed a PhD, and who had trained as a nurse as well as a teacher, she was very much in favour of educational research and in particular, a quality science program.

6.2.4 The Constraints of Personal Life

February 14th. My husband had a heart attack. I had some work ready to drop off to my supervisor but it never made it. Life over the next two weeks was particularly hectic
as I rushed back and forth to school and hospital, and indeed over the next few months I was extremely busy. The time schedules were pushed into the background. Although I tried to pick up on some of the work, obviously my husband’s needs had to come first and that meant that I was slowly going backwards.

During the time of my husband’s hospital stay, the science program suffered from mediocrity. I was working automatically, both in classroom teaching and science lessons. It was during this time that the staff member who had attacked the science program the year before, approached me and said that she was dropping out of the reciprocal teaching arrangement. When asked why, she replied that she did not want to have to take my grade while I took hers for science. She spoke to the principal who tried to convince her to remain in the program. She insisted. By this stage, I really didn’t care if she dropped out. However her students protested when they found out. Now I was down to taking only two grades for science, a far cry from when I had been specialist science teacher taking science across all seven grades.

I had to question why I really wanted to take science. Was it ego? Was I better than other teachers at taking science? Was it for my pleasure or the students’ learning? It certainly was not easy being the only one pushing to continue with science like this. I believe the answer lies partly in the fact that I know some other teachers would let science slip if there was no specialist science teacher. Not necessarily from lack of trying, but rather from the crowded curriculum we are faced with. Another factor, gleaned from my reading of research literature, implies that many teachers may have basic misconceptions about science which are then presented to the students. Maybe my science background does make me a better person to teach science, I’m not sure.

Parents at the school whose students had been there for many years were horrified with the decline in the program, and it was raised several times at school council. Always the answer was the same - that there was not enough money to support it. I had been believing that until I realised that in 1996 the school had been paying for an art specialist from the global budget. One staff member was being used to support special language programs and be library specialist. Overall, allowing for all specialist programs, the school was supporting a time fraction of 1.4 extra staff above classroom
teachers. With a little manipulation, there really was no reason that science could not have been supported. It obviously was a matter of priorities.

6.2.5 Another New Start

In April, 1997, we had another change of principal, Brian (pseudonym). Each of us was given the opportunity to voice our expectations and thoughts about our position at the school. I reiterated that I would really like to take science as a specialist area again, but also indicated that I was able to compromise. Over the next few months, Brian had many opportunities to see what was going on in my science classes and he was visibly impressed. Several times he commented that he would really like to see me operating the program across the entire school. Often visitors to the school would come in on one of the science lessons and comment on how lucky the students were to be able to have science in such a way. Always this was followed by a complimentary comment from Brian indicating strong support for the program. I began to feel hopeful that maybe the following year I would be able to teach science again across the school.

As well as this support from Brian, I had been getting much support from the newest staff member, Marilon. As I mentioned earlier, she stated that she would like to see my strengths used more fully and had vigorously voiced her support of a continuing science program. She particularly targeted the new principal with her comments. Sometimes I felt embarrassed by her enthusiasm, although it was a great change from the animosity of the last few years.

After attending a PD Coordinators’ meeting I spoke to the principal about the school’s vision statement ‘Towards 2000’. This document was compiled after a lengthy survey of the community in 1995 and supported science at the school strongly. It was to my advantage to promote it. Brian then brought it to the attention of the management committee and indicated that he would like to release me from classroom duties to teach science.
6.2.6 The Impact of School Change

It was at one of our management meetings in October that Brian first voiced the idea of introducing a new position of Leading Teacher (LT) 3 at our school as Junior School Leader. I saw the immediate ramifications to my acting LT2 position and was disappointed at this new development. However it was only an idea. I thought that I might stand a good chance of contending the position because of my past coordination of school events, my leadership of different school teams and my involvement in the school at management level. I was wrong. Brian very quickly indicated his preference for taking on somebody from outside the school. When I asked him if I would have a chance at the LT3 position, given his obvious bias, his response was that there were 'two others on the panel'. In other words, I was not likely to gain any support from him. The other ramification of this was that in creating this position, we were now over the number of our staffing allocation and funds to support this position would have to come out of program budgets, or from an increase in our student numbers. Brian thought that we would have between 210-215 students in 1998, but many staff did not support this idea (based on past experience). We suggested that perhaps he should wait until the commencement of the 1998 school year before advertising the position, just to see how we were going. He was not interested in our suggestions, and at the staff meeting when we discussed it, I could see that he was getting angry with two staff members who persisted.

Owing to the tightening of the budget, Brian started voicing his concerns for the running of all specialist areas. Again it is all a matter of priorities. There has been an incredible push on schools to upgrade their school computer facilities under the umbrella term of Learning Technologies. Brian and the Learning Technology Coordinator had been looking into a lease arrangement which would mean committing the school to an additional $20000 per year for the next three years. I could not understand how the school could afford to take on an extra staff member and commit to this as well. Obviously something had to go. A science program could have been instigated had there been less money spent on Learning Technologies or on an extra staff member.
Several staff meetings were devoted to discussion of staffing positions, specialist areas etc. One staff member declared that she would willingly forego music to gain science as a specialist area. Although there were no comments of support, there were also no comments against the idea, so it was decided that music could go. At the next staff meeting, one staff member had been working on a timetable which would allow me to be released from the classroom three afternoons a week to take science. Although I was not very happy about how she had timetabled it, I was grateful that another staff member seemed to support my program.

Our budgets had to be prepared by end of October and in light of the projected spending, we were all told to cut our budgets 'to the bone'. I left in the Casual Relief Teacher (CRT) component, which would allow me to be released for science teaching, believing that science was still a considered possibility. At a further meeting with our financial adviser in early December, all budgets were again slashed, with the idea of supplying enough money to get them started for term one. (Science went from $7500 with the CRT component, to $1500 without it, to $450 for the basic management level.)

While all this was happening, the LT3 position was advertised and I applied. There was a strong emphasis for experience in the Junior School which really was against Merit and Equity principles. I believed that although my experience in Junior school was not strong, I had other organisational experiences which would support my application. I was dismayed and very angry when I was not even selected for an interview. I felt let down by my colleagues, particularly those on the panel who I had believed would be supportive. I was peeved when I found out that a personal friend of Brian's had been offered the position. To top matters off, Brian decided to put me down in the Junior School area because he 'needed a strong teacher to manage that difficult grade and somebody who would be empathetic to the needs of the integration student'. I didn't believe a thing that he said. Effectively, by placing me with that particular grade, I could no longer be released to take science. The composition of the grade was such that the students could not be subjected to grade swapping and many changes of teacher. So I felt that I was dealt two blows at the same time.
I was tired of trying to push science on other teachers who were less than enthusiastic. I was tired of working in an atmosphere of undercurrents. I was tired of working with colleagues who seemed supportive but really were not. I was fed up with all the extra demands. I really did not want to be a teacher at that school any more. I started to look for other positions.

I gained several interviews, but did not sell myself enough (I asked for feedback after the interviews). My applications were excellent, and my initial contact with the schools had gained me interviews. I had to learn to be more assertive at interviews.

I finished the year with the determination that I would work towards making myself more versatile and employable outside the school. Apart from classroom teaching, I would only do what was necessary to improve my chances for positions at other schools.

6.2.7 The Action Research Project - 'Buddy' Science

Over that summer break, while I prepared for my new grade level, I had a thought about teaching science. When we started back, I approached the Prep teacher about an interactive arrangement (called a 'buddy' program) between my grade 2 and her grade, with the idea that on one week we would do science, and on the other, she could choose another curriculum area to work on. This would mean that she could give me constructive criticisms about my science approach and my students would be able to assist hers in their learning. She was very enthusiastic and supportive. I approached the other teachers at Russell Primary School who had originally offered to help me and they were still prepared to assist.

That weekend I worked on a program for the year. I would have preferred to run with my old program, but under the circumstances felt that I had to stick to the CSF guidelines for this level to give students continuity. This was assuming that all teachers were teaching science using the CSF.
In addition to this, I was able to argue strongly to do the 'Keys to Life' training. With less direct classroom experience in the junior school than other staff, it made sense for me to gain the literacy teaching strategies in a compact manner.

The science program has not run smoothly, despite the support and enthusiasm of its two contenders, myself and the Prep teacher. There have been several things which have forced us to reschedule and it has been difficult trying to implement a constructivist approach into the material. I have been unable to meet with the teachers from Russell Primary School, due to their changing timetables and lack of flexibility.

In looking back over the last nine years of teaching, there are several things I would change if I could. Certainly, while I have enjoyed teaching at primary level, the uncertainty of position has made it less pleasurable. The changes that have been implemented over the last five years have turned schools into very stressful places, particularly at our small school where even small decisions impact on the entire staff. Change in itself is not a problem, I can accommodate change, particularly if I can see some benefit, or as has been the case, I can see that railing against it will do no good. I have not pursued a change of school which has now worked against me. Perhaps I have been too dogged in my approach to science, perhaps I should have pursued other avenues of change. I have been constricted by my studies sometimes. Having committed myself to looking at primary science, I have been locked into that system for the last few years. Also I have stayed at my school in the belief that I would be able to eventually teach science again as a specialist, or other similar system.

It is interesting to note the changes in my status as science specialist over the last five years. In 1992, I was a full-time science/PE specialist teaching seven grades each week. In 1993, although I was still the science specialist, I was required to act as a CRT in classrooms if teachers were absent. In 1994 I spent a term in a classroom (part-time) when the teacher went on long service leave. In 1995, due to staffing numbers, funding restrictions and other priorities, I was placed in a grade full-time. I still managed to teach science to the upper four grades. In 1996, by gaining funds through the school council, I was able to teach science to the upper three grades. In 1997, one staff
member withdrew her students, and I was then only teaching two grades. In 1998, I took the Buddy Science program across two grade levels. Now in 1999, I take science only in my own grade.

6.3 GETTING STARTED

I wanted to follow the action research model suggested by Altrictrer, Posch & Somekh (1993, p7) mentioned earlier in Chapter Four. This uses four stages of action: finding a starting point; clarifying the situation; developing action strategies and putting them into practice; and making teachers' knowledge public. At our first meeting, I wanted to discuss the options and to set this all up with the other two collaborative partners. Each had agreed in principle to having an extended meeting of up to one hour each month. This created problems which will be discussed later in this chapter.

Over the year 1998, I ran collaborative science sessions with two grades, grade two children and preparatory grade children. Working a buddy system, children were paired or teamed with others from the alternate grade for the duration of the year. The younger students gained the support of their older peers and the slightly older children gained the positive learning behaviours of cooperation and peer tutoring. The science sessions were scheduled to be held fortnightly with the option of using the alternate week for other curriculum areas. Each session would run for one to one and a half hours. The other teacher involved (JM) was to act in a team teaching situation and as a critical friend to give feedback after each lesson. Apart from her experience as a teacher, she possessed a strong biological science background, having had a career as a nurse prior to teaching.

In addition to this, I had arranged for teachers from another school to be involved in the assessment of the practical material. One (JR) was very supportive, suggesting that she would use the same program with her students so that a more valid comparison could be made. This in fact did not occur as she found it too difficult to reconcile my suggested program with her school-based themes. She decided to continue with her theme-based program, responding to her school and personal needs. This was a disappointment, particularly as it became obvious that individual time each week could not be found to
sit and discuss the practical sessions with these other two teachers. The best that could occur was JR’s assessment of each lesson in written form, several weeks after the session. The other teacher really was not very supportive, indicating that she felt that she was teaching a different level (Grade 5), her feedback would not be useful. On the suggestion of a meeting, or interview, she made excuses and only offered a telephone contact. I decided not to pursue the contact with this teacher any further, but to concentrate on gaining information from those who were more willing to help.

6.3.1 The Buddy Science Program

Initially I faced the dilemma of exactly what to teach my science students. My preference would have been to use my established program from the time I had been a science specialist at the school. I had improved this program over many years of teaching it, adjusting the content and student tasks until it was a comprehensive program which reflected the learning requirements of students this age. However, the problem with using this program was that it did not fit neatly into the Curriculum and Standards Frameworks (CSF) guidelines for Level One. Bearing in mind that in subsequent years, the students should encounter science experiences based on the CSF, I felt that I would be doing them an injustice if I did not complete the suggested topics. There would be no continuity to their science learning.

The other consideration which I faced was that of matching the science with the classroom themes. This proved impossible in the short term because the school was going through a transition stage, deciding whether to keep the whole school topics which had been in rotation for three years or whether to change them for something else. A decision was not made until the end of first term, by which time I had already started the other program. I suppose I could have altered it at this time, but I still faced the dilemma of bringing things into line with the CSF requirements.

In light of all these considerations, I decided to plan and implement a program which followed fairly closely the guidelines of the CSF. To do this I used several documents. The CSF Science document was the main one, but I also used the Science Course
Advice (Level One), and Exemplary Science (Board of Studies document). I had decided to follow the Level One CSF with the thought that it could be extended to suit the needs of the grade two students. I prepared an outline of between four and five sessions per term based on the four areas of: Natural and Processed materials; The Physical World; Earth and Beyond; Life and Living. In collaboration with the other teacher, I designated specific dates and times to these planned activities as we were both aware that it is much easier to timetable under these circumstances.

The plan was passed onto the other teacher for perusal and after agreement, the initial lessons were considered. I decided not to plan each individual lesson until just before its scheduled time in case other factors came into play.

6.3.2 Constructivism Revisited

I did revisit the literature on using constructivist principles. Some of the practical examples related to establishing children’s knowledge using probes (Russell Tytler, Science Teacher’s Association of Victoria Conference STAVCON 1996). Several techniques suggested by an inservice I had attended at STAVCON were part of my normal teaching practice anyway but it helped me to clarify my ideas:

- Discussion using probing questions;  
  This is probably the most common way of discerning students’ prior knowledge, by specific questioning and discussion at the commencement of the lesson.

- Now/ Before that/ Before that;  
  This is a technique for discerning children’s knowledge of the stages of development of an item, particularly with reference to natural and processed materials. The child is asked to describe a situation as they see it now, how it was before that and taking it even further, what they believed the situation was before that. This method of tracking children’s prior knowledge allows teachers to see if children have established the sequential links between different stages in science.

- Concept maps;  
  This is a very common technique in teaching as it links children’s ideas around a common theme or topic. The teacher can see what the children already know and what relationships they have established. At the end
of the session, a new concept map can be drawn which highlights the additional information the children have gained. Alternatively, children can continue to add to the original concept map as they discover new ideas and links.

- **Drawing an explanation;**
  Children actually draw their reasons for something happening. This is particularly useful for young children who have difficulty articulating their ideas or writing more formal reports.

- **Predict, observe, explain;**
  Given a possible scenario or problem, children are asked to predict the outcome of a set of circumstances or experiment. After observing what actually happens, children are invited to comment on why things occurred the way they did.

- **Demonstration with questions.**
  This is excellent where the experiment is too hazardous for the students to undertake themselves, where there are limited resources, as an adjunct to other investigations or where there is limited time.

I found it useful to revise these techniques before planning my lessons so that I considered different approaches. Many of these techniques were a normal inclusion in my lesson presentation but some were not. I wanted to expand my expertise so each lesson had to supply me with further information about my teaching ability. In addition, I wanted to improve the students’ learning experiences by altering my presentation to make it more interesting and to challenge them to think for themselves.

### 6.3.3 Supporting Teachers

JM’s role was that of supporting teacher in a team teaching situation. Although I led the lesson, she would assist with the management of the children and in many other ways. We would group the children according to the social needs of the Prep, pairing them with a grade two child who would be supportive and helpful. JM arranged this as she knew both groups of children - most of the grade two children had been in her grade one the previous year. JM would also supplement the lesson. Due to her own teaching and science/biological background as a nurse, she had many different experiences and knowledge to add to any lesson. Generally this was done at a convenient pause, or she would raise a question with the children relating to what we had been investigating. At
no time did she attempt to over ride the lesson or take over. In all instances, JM was an extremely supportive team teacher.

JR’s role changed over the year of the practical program. Initially, she was approached to discuss each practical session with me from week to week. I had hoped to gain her expertise in developing each lesson and in the critique of the concluded lesson. JR agreed to this and offered to extend her understandings by working through the same practical program as I was offering to the Buddy group. This exceeded my expectations of her participation, but I gratefully accepted the offer as I felt that it could lead to even greater lesson development. However, trying to come together for weekly meetings proved very difficult as her busy schedule and mine precluded us from meeting on a regular basis. There were staff changes at her school which meant that over the first four weeks of school the yard duty timetable was changed from week to week. We could not find a time convenient to both of us. When we finally met in March, it was to learn that JR had abandoned my Science program in favour of her own. She felt that it did not fit with her class themes and therefore would not be as relevant to her students as her theme based program. Although disappointed, I was not in a position to criticise and accepted what help she could offer. The weekly meetings did not occur even though I contacted her frequently to see if we could arrange something. Eventually, I decided to give her a hard copy of each lesson which included my aim, method, results and comments. JR would then write in her comments based on this. This occurred on a regular basis, after every four lessons or so.

The lesson procedure occurred as follows. Using a lesson skeleton developed at the start of the year, I wrote up each lesson prior to giving it. If there was time, JM would peruse it and offer suggestions. This was a rare occurrence. More often, JM and I would discuss the lesson over recess a day or two prior and I would incorporate any changes she suggested if they were appropriate. As soon after the lesson as possible, I would write down the ‘Results’ of the lesson with respect to the children’s abilities and understandings. If possible I would try to gain JM’s interpretations as well. ‘My Comments’ were my further reflections on the lesson, given time to think about all aspects.
‘Observations by JM’ were written after the lesson, often not for several weeks.
Feedback from JM was more likely to take the form of a few comments during or at the end of the lesson.
‘Comments by associate - JR’ were written several weeks after the lesson and without any direct experience of the lesson. In many ways they were limited in how they could help me in the immediate future, however it was interesting to note some of the comments made.
‘Additional Comments’ were added later by referring to my professional journal.
These were used to highlight what else was occurring throughout school, in particular with reference to the impact of other school needs on the science program.
‘Issue’ - these comments were identified after the completion of the entire program.
After reading through all the Science sessions and comments, definite issues started to emerge. These were then highlighted at the point that they first became obvious.

6.4 SCIENCE PRACTICAL SESSIONS

To illustrate the extent of the Buddy Science Program, I have listed each session below.
After this, I have included the first two sessions to indicate how the practical sessions were carried out and subsequently written up. The lesson outlines for the entire Buddy Science Program have been included in the Appendix at the conclusion of this document.

- Collections 20/2/98
- Noting changes to natural things 6/03/98
- Materials - How things change 1/04/98
- Electricity 30/04/98 & 7/05/98
- Planting Pansics 14/05/98
- Battery power 4/06/98
- Magnets and Magnetism 11/06/98
- Light 16/07/98
- Sound 23/07/98
- The Weather 6/08/98
- Day and Night 3/09/98
- Colour 16/10/98
- Snails 5/11/98
- Senses 19/11/98
- Fossils 15/12/98
Example 1 - Buddy Science Practical - Collections 20/2/98

Aim
To have children collect things from the school environment and to group them according to some recognisable quality.

Method
1. Discuss with children the word ‘environment’. Ask if anyone knows what it means and allow them to give examples. When sure that all students know what this means, discuss task and set them to it. Emphasise the need to collect four different things each. They will work in teams of four or five (two teamed buddies).
2. Walk around the school grounds discussing with individual groups what they have collected. Allow enough time for all groups to find enough things (fifteen minutes).
3. Return to library and talk to children about grouping, giving them examples but ensuring that they are given full reign to explore their own categories. Allow ten minutes for grouping to be achieved. Children circle their groups and label them (emphasise that correct spelling is not a problem otherwise some will worry more about that than the task at hand).
4. While students are grouping, JM, parent & I talk to children, asking them to explain their groups.
5. Sharing time. Ask children to explain their groups to the other children.

Results
I felt that this went very well with the students understanding the issue of environment at the simple level of ‘the things around us’. They gave examples which included the natural environment, plants/trees, air, birds etc. and the human-made environment, buildings, rubbish, playground equipment and many others.
They collected many different things and were able to group them according to colour (brown, green), origin (tree, plant), position (above the ground) and attributes such as soft/hard. Some students showed an ability to use two categories for grouping (colour and hardness)
My Comments
I would like to know if there was another way I could have gained an understanding of the children's prior knowledge of the environment given the limited time of the session. The session ran out too early, with there not being sufficient discussion/sharing time for the children. Must allow for this. Maybe we can share this next week.

Observations by associate - JM
The children enjoyed this preliminary buddy session. Social interaction will be an important thing this term as some of the grade 2's are immature with quite severe problems in some cases with literacy levels and concentration.

Comments by associate - JR
Surely they discussed and shared in their groups and with you as you checked on what they were doing!

Additional Comments
Week Zero and Week One (9-20/02/98)
The week leading up to the new science program is busy with meetings at Russell Primary School with JR and JO, at Maxwell Primary School with JM (regarding this program), a swimming meeting at Geelong East Primary School and a Program Support Group meeting with parents of my integrated student. All these meetings require ongoing action so time allocated to meetings is tripled by the additional things each one brings with it. As well as this, there is a stop work action on Thursday, Feb 12, a Parent Information Evening on Mon, Feb 16 and Staff and School Council meetings on Tuesday, Feb 17. It is during this week that I realised that a long term basketball clinic arrangement with 'Life Be in It' clashes with science on Thursday, necessitating the changing of science to Friday.
After the science session, JM and I had a quick discussion, but it was not too constructive as JM felt that all went very well.
Week Two (23-27/02/98)

Also went to Russell PS to discuss the practical with JO and JR but found that they were unable to meet due to a changing yard duty timetable. With the situation so fluid in their school at the moment, they cannot commit to a regular time for discussion. This is very disappointing, but I cannot push these others too hard or they just might opt out of the arrangement.

There is a whole school theme this week on Safety House, culminating on Safety House Day on Thursday. I am glad that science wasn’t scheduled for this Thursday or it would have meant yet another change. As it was, our alternative buddy activity had to be rearranged to suit the overall school timetable.

I was able to extend the grade two students back in class with ongoing discussions and activities relating to the grouping of natural things. We broadened the items to include other things that they had experience with and related those items to the human-made things.

*Issue - the difficulties that arise in trying to collaborate with other teachers due to other demands on time and effort.*

Example 2 - Buddy Science Practical - Noting changes to natural things 6/03/98

**Aim** - to introduce children to the changes that occur in natural things, some caused by humans, others by nature.

**Method**

1. Discussed last week’s groupings, just to reinforce. Asked children to describe how some things changed. They needed some examples to understand what the question meant. After this most were able to give some examples.
2. Showed them a leaf and asked them to describe the changes they could see. We discussed how the changes occurred. What had caused them?
3. In buddies, students were given a leaf, and had to write an account of the changes they could see, and asked to explain them.
4. Given twenty minutes to complete the task, while teachers circulated to discuss students work with them. Some students explained, most didn’t.
5. A selection of the students' work was presented at the Junior School assembly, with students reporting on their results.

Results & Comments
Students were able to accurately locate most of the changes, but only about 30% offered explanations. Maybe this would have been better had we had the time to collect the leaves ourselves, so that students had some say or 'ownership' over what they described. Time is somewhat restricting. Am I attempting to cover too much? I don't think so.

Observations by associate - JM.
This was a good follow-up to the first session but not quite so successful and I feel it was a bit abstract for the preps. Coral is right, it would have been better if we could have collected samples ourselves but time was a restricting factor. This work on change, when we use popcorn, jelly, ice melting, water boiling etc. will be more concrete and significant for the preps.

Comments by associate - JR
Found that a similar lesson on change worked well by setting up a longer term experiment with fruit and bread. It started by finding a mouldy sandwich in someone's locker. The children were able to observe the original object and then watch a progression as the mould grew. The changes were observed and the children were able to discuss these because they had a common experience. They were then able to more readily talk about their observations of objects we found in the environment that were changing in different ways. Many of the children brought things from home and share them with us.

Additional Comments
This is useful information from both JM and JR. I obviously need to make the practical sessions more concrete, and expand the students' background experiences first. With buddy science, it would be difficult to run the mould experiment which requires
ongoing observation and discussion, but there are probably other ways of achieving the same result.

I wasn’t comfortable with the preparation for this lesson. I was aware that it didn’t ‘feel’ right. I don’t feel very confident about using the principles of constructivism in a practical way. I wonder if there was another way I could have introduced this lesson which used children’s prior knowledge in a more concrete way.

_Issue - How does Constructivist Theory relate to my teaching practice and the ensuing problems I have in incorporating it into the lesson?_

Week One (2-6/03/98)

This week was somewhat quieter in terms of meetings, only staff and unit meetings running.

I have to start arranging the school swimming program, putting students into groups and collecting all the permission forms. Consequently, as the swimming program takes such a huge amount of time out of each day, science will be postponed until after swimming.

Week Two (9-13/03/98)

This week started with a Professional Development Coordinators’ meeting on Monday afternoon. Staff meeting Tuesday after school and Unit meeting Wednesday lunchtime.

I will be starting Keys to Life (reading) training on Thursday of this week and need to study the accompanying books and video before attending the first full day session.

Following this, on the Friday we have a whole school excursion on the steamship ‘The Wattle’. There really is very little time left at school to fit in all the curriculum areas.

Week Three & Four (16-27/03/98)

Unfortunately, buddy science had to be cancelled this week (20/3/98) due to other commitments of Swimming, Keys to Life and JM’s commitments as Integration Coordinator. JM took buddies for alternative activities. In addition, I had to prepare a questionnaire relating to the Geelong Regional Science KLA Network meetings, to be faxed out to all schools. For our last two meetings, we have had little support from
teachers around the Geelong area and need to canvass their opinions. School Council meeting this week as well as staff and unit meetings.

I find myself frustrated. We decided to try to fit science in this week (26/03/98) despite swimming. We are a week late with science buddies and still can’t do it as planned as we do not have the parent support for the next big activity. There was a mix-up as both JM and I thought that the other was organising the parent help. We will definitely organise it for next week. It is amazing that in such a small school with so few staff, that communication can sometimes be so poor.

*Issue - Communication between staff is poor, despite the fact that the school is small with low staff numbers*

6.4.1 Buddy Science Practical - Materials - How things change 1/04/98

**Results**

Students were able to discuss the changes they had seen and relate them to changes of state.

**My Comments**

I was very happy with the general approach to this task, although we nearly ran out of time again. The organisational details take much longer with this age group, particularly when there are twice as many students. I would like more sharing time at the end, but maybe this can be done back in the individual classroom when sharing the butter.

I can’t understand why this is taking so much more time to organise than my previous science lessons, maybe I’m just out of touch with what I used to do. It seems to be a greater effort than I expected. I remember when I first went into a classroom setting full-time that I thought that the overall organisation was simpler than being a specialist. Maybe that’s it.

This was to be the last organised science lesson for the term.

*Issue - Time and effort required to organise the science sessions are greater than I expected.*
Follow-up (8/04/98)

On the following Wednesday (no time Monday or Tuesday) I went through the butter manufacture again with the students. They wrote a sentence about the butter churn into their English books (it became a handwriting task as well!) and students viewed the curds and whey (which by this time had soured.) They tasted the butter on some dry biscuits. I didn’t make this into a full lesson, rather just an interesting adjunct to the previous lesson.

Observations by associate - JM

The children really enjoyed these activities as children of this age group seem to understand scientific ideas through practical experiments. The popcorn making was particularly popular because at the end of the day, as well as tasting their finished product, they were able to take a small bag home with them. The butter churning was followed up by a tasting session on the following Monday where the children tasted dry biscuits with their freshly made butter.

The practical organisation of splitting forty-four children into four groups and transferring them to different activities within the school setting is difficult, and some lapses in time were caused in the changeover.

This session really showed the children how, under certain circumstances, some materials can change their state.

Comments by associate - JR

* JR was not aware of the parental assistance when she made these comments.

As a classroom teacher having young children at four stations with heating equipment is an experience I would avoid. The candle and popping corn would become a demonstration piece and melting (probably in the sun compared with a cool place, grade heater or in water of different temperatures) and dissolving different materials (sugar, corn flour, salt, flour) would become the stations. There are different ways to make butter, churn, beat, whip, shake that have their own experiences for the children.

Additional Comments

Week One (30/03/98-3/04/98)
This week I have a Unit meeting, Staff meeting, a half day inservice for ‘Keys to Life’ (KtL) on Thursday and a full day, whole school inservice on KtL and Information Technology. We visited another school in the morning to see their set-up and then came back to school for visiting guest speakers. We decided to change the science back to the Wednesday to overcome the clash with KtL and to be able to fit it in!

This practical session was originally scheduled as two sessions on how materials change, but in light of the other incursions into our time, I combined the sessions to make one. I really want these science experiences to be useful learning experiences for the students. JR’s comments are useful if these activities were restricted to the normal classroom program. JM’s comments reflect the lack of time for actually participating in the practical sessions, bearing in mind that so much time is spent on procedural matters. Simplifying the sessions would be an answer. We have finished term one and have only had three science sessions, not four as time tabled. Is this an indication of what is to come?

6.4.2 Buddy Science Practical - Electricity 30/04/98 & 7/05/98

Results
The students completed the tasks in a satisfactory manner, although some children do not have a knowledge of what is actually powered by electricity. Because a car has a battery, they included that as a thing that runs with electricity. They are not wrong, merely not accurate.

My Comments
I don’t think that I should expect a greater level of understanding than exhibited by students. Again I felt that time was too restricting. Next lesson we’ll deal with battery power and some differentiation may be gained then.

Observation by associate JM
The introduction to this lesson was very good as it showed a great lack of understanding, particularly with the younger children, of their concept of electricity. The children were very quick to point out that the tape-player needed to be plugged in
to work, and Coral was able to then draw them out to talk about wiring to buildings, electricity supply and battery power. For children of 5 or 6 years of age this is a profound piece of knowledge. The children, after the introduction, were able to work with their buddies to select pictures of electrical items from magazines which were then pasted onto sheets and made into a class book. The positive suggestions in this lesson were directed at their presentations of individual pages rather than their understanding of electricity. The children did not enjoy this activity as much as other activities during which they conducted an experiment of some kind.

Comments by associate JR
Good source of developing an understanding of children’s prior knowledge. I would have assumed more understanding but have been reminded by this lesson of yours that assumptions cannot always be left unchallenged.

Additional Comments
I was not very enthusiastic about this lesson. It is a different style to what I would normally use, however it was one recommended in the literature (Course Advice). Usually, science lessons are much more ‘hands on’, with children reacting to their observations. This lesson used a standard classroom technique of ‘cut and paste’ to ascertain what children already knew. The children also displayed less enthusiasm for this activity, but still completed it well. It was interesting to use this activity to gauge children’s prior knowledge and for that it was really very worthwhile.

Week One (27/04-1/05/98)
After two weeks’ holiday, I find that I am not all that refreshed. I spent about three days of the break on school work, getting learning centres and other school tasks organised. This is much less time than I would normally devote to school things. Again a reflection of my overall tiredness and lack of commitment. My Journal entry for the 28th. April read, ‘Have we really had a break! ...I don’t really have that much enthusiasm. I can’t afford to relax, as there will be other interruptions to our course anyway.’ This lethargy is a result of the complexity of the changes at school coupled
with the ongoing stress of trying to complete the action research components of my studies. Staff meeting, Unit meeting as usual this week.

Later that week, I went to Russell PS to speak with JR and JO. I was able to speak with JR while she was on yard duty. This was when she informed me that she hadn’t followed the planned curriculum as she had offered. She was still unable to commit to a meeting and although extremely apologetic, said that ‘her school and home life is so hectic that she couldn’t fit it in just then.’ (Journal, 29th April, 1998)

*Issue - lack of collaboration is a problem as I can’t get the feedback I expected on these lessons.*

Week Two (4-8/05/98)

As I had KIL training on Thursday, JM finished off the practical work with the buddies. This is an unusual situation in that normally our science would not need to be carried through to the following week. I found it disappointing that I was not able to complete this activity with the students. I did discuss this further within my grade and Junior School Assembly presentation gave me the opportunity to extend their knowledge and understandings.

Wednesday after school, I attended an inservice on Bullying, along with five other staff. This is in addition to the normal meeting regime.

6.4.3 Buddy Science Practical - Planting Pansies 14/05/98

This is Arbor week and June wants to do some planting with the children. We still did it as a buddy activity, but she organised it. She was somewhat hassled by the whole activity and understands the constraints of such a large group with heavily practical tasks.

Comments by associate JR

You have mentioned these constraints (large group with heavily practical tasks) and I would agree that a large group for practical tasks is very difficult. Did you consider altering the grouping or renegotiating the timetable to lessen the size of the group?
Additional Comments
When we first thought of the idea of running science in the Prep grade, I offered to do it during my preparation time, so that I could have the benefits of JM as a critical colleague. She objected to the loss of my preparation time, and suggested that it would be detrimental to attempt to do extra work while decreasing this time. There was no way that the school was able to fund my action research into improving my science teaching practice, so we had to work around these constraints. Having the larger group was a trade-off against retaining preparation time. As well, there are other benefits of working a buddy system, one for the children’s cooperative behaviours and also for running the grade two science session at the same time. This did require additional follow-up in some cases to further extend these students. Both JM and I believe that students learn best when trying things for themselves, therefore the practical aspects of the science program had to remain. Although JR’s comments are relevant, we had to work within the parameters of the larger group, and practical tasks.

Week One (11-15/05/98)
There has been a lot of media coverage about the school curriculum. Phil Gude commented on the radio about the review of all KLAs. The newspaper also carried an article about the review but it added another interesting comment. It clearly stated that the areas of top priority were English, Maths, Science and Civic knowledge. In my Journal of May 12th. I wrote ‘I feel somewhat vindicated for my long and constant struggle to keep science at the forefront of the discussions at Maxwell PS.’
We thought that we might try to fit in an extra science session this week, as we are now behind our prescribed curriculum. However, with KIL training Thursday afternoon, staff and unit meetings, a whole school activity (play ‘Creatures’), and my requirement to attend a Science Focus Group meeting in Melbourne all day Friday, we have run out of time again.

Week Two (18-22/05/98)
I decided to run an environmental science activity related to trees with my class as a last minute decision. I based it on one found in the Gould League book, one which I had run many times before. It required the children to look at different characteristics of
trees, bark texture, height, leaf shape etc. It really was an informal wander around the school ground observing the trees more closely than usual. Children all enjoyed it greatly as did the Integration Aide and me. Meetings include staff, unit and School Council as well as a Focus Group Meeting in Melbourne on Friday, May 22nd. I enjoy the collegial support from these meetings. Extract from my Journal for May 22 read as follows:

The discussion over lunch dealt with parent interventions at school. One teacher commented that the parents at her school expected the school to right all their child’s problems, even when the school believed that the problems stemmed from home. There was general agreement that parents are shopping around a lot more and in fact are demanding more of schools and individual teachers. Discussion then moved onto issues of trying to fit everything in and how some teachers timetable things to access two hours of English and at least one hour of maths a day. One teacher commented on teaching as a career and said that she wouldn’t advise her children to take up teaching. Others commented that there was no future for new graduates, with limited tenure and no guarantee of a future job. One person there, a recent graduate, commented on the difference between the place she worked at (an exclusive private school) and the state schools that she was at to complete her teaching rounds only eighteen months earlier. She said that on her rounds there was significantly less pleasure and fun at the staff room. ‘Teachers looked tired and worn out’ was her comment. At her current position, there is less strain, certainly there was no push to address all the DoE initiatives and therefore being a teacher there was less stressful. ‘We don’t even do the CSF’ was one of her comments although she admitted that it might eventually be introduced.

Issue - Morale of teachers is low due to continuing changes and pressure to adapt to changes.

Week Three (25-29/05/98)

We are two weeks behind now and I started making plans for our next science session this week. I suddenly realised the we are having a whole school activity for Education week during our science time. All children are coming together for a buddy reading activity and other ‘sharing’ things. We are preparing a song to sing with our buddies and have been spending extra time with them this week practising. This means that we really can’t rearrange the timetable to fit in another science session.
6.4.4 Buddy Science Practical - Battery power 4/06/98

Results
Students were fully involved in this practical task. They worked well in pairs and teams and most solved the problem without too much intervention. Some solved the problem in five minutes, some in twenty. All drew their diagram of the circuit reasonably accurately and were able to describe how they got the globe to work.
Some students wanted to experiment and this was allowed if they described what they wanted to do. One student persisted with short-circuiting things even after being asked not to. One group had a six volt globe which they thought was faulty because it didn't light up properly, so were given two batteries to see if they could change this.

Conclusion
From discussions with individuals as they were completing their task, it was apparent that students developed an understanding that electricity moved through wires to light up the globe and that they needed to complete the 'loop'.

Observations by associate JM
This lesson was a really wonderful experience for the children as Coral followed up the previous week's discussion about electricity with a practical session of setting up an electrical circuit. Some of the behaviourally-challenged children experimented with short-circuiting things but revised their behaviour when instructed to do so. The faces of the younger children showed their fascination with this activity, and discussion continued in the classroom for several weeks after this activity.
Note - JM used the term behaviourally-challenged to describe those students who need constant supervision and management to do the correct thing.

Additional Comments
Fortunately the topic of Battery Power (Circuit Electricity) is one which always enthuses children and I decided to take a minimalist teaching role. This led to some minor problems of globes being blown, and some being under-powered, but these were soon fixed.
Week One (1-5/06/98)

We (the other Regional Technology Coordinator and I) had organised for a
Science/Technology KLA Network meeting to be held on Tuesday. Again it was very
poorly attended. We put this down to poor communication as the notice did not go out
until the Friday before. The notice was sent to the Curriculum Coordinator well over
three weeks ago to disseminate by facsimile machine, however it was mislaid. When
we contacted him again earlier last week, he still took several days to send out the
replaced notice. It is a matter of priorities - his personal priorities taking precedence
from our KLA commitments.

6.4.5 Buddy Science Practical - Magnets and Magnetism 11/06/98

Results
The students were enthusiastic about their tasks. Some of them discovered that the
magnets didn't stick to gold (in rings) or silver (in earrings). They were able to discuss
that magnets stuck to most metal things and were surprised to discover that some things
were in fact metal (the heater looks like wood!)
In the second part, the students were able to compare magnetic strength by comparing
the number of paper clips stuck to the magnets.
No recording was asked of the students this week. One, to give them a break from it,
but also to allow more time for group discussion and activity.

My Comments
Discussion was lively and children demonstrated good observations and understandings.

Observations by associate JM
This was another extremely successful lesson. The activity where the children had to
discover what articles in the room the magnets would stick to was extremely interesting.
The children actually discovered that magnets did not stick to everything that was metal,
and that some things that looked like other materials were actually metal, such as the
white board. The activity where the children had to experiment with paper clips and
magnet to see how many and individual magnet could hold stuck end to end, kept them
focussed and involved them in mathematical estimates, comparisons and actual counting as well. This was a very successful activity.

Comments by associate JR

As children were very interested in magnets did you feel it would have been beneficial to have extended this topic for another week? Sculptures can be made using magnets and different metal objects like bolts, screws, nails, etc. More than one magnet can be used with different objects. Metal filings. Magnets through different surfaces and thickness of surfaces. Magnets used in different application (for cleaning a fish tank surface). Fishing game.

Additional Comments

Perhaps under other circumstances, this lesson would have been extended. However, at this time we were already behind and it was also important not to allow any more loss of time. Probably, for preps, this is what I would normally do, however for the older children (grade two) I would involve them in more practical activities.

Issue - Morale of teachers is low due to continuing changes and pressure to adapt to changes.

Week One (8-12/06/98)

Meetings this week include staff meeting, unit meeting and Focus Group meeting in Melbourne all day Friday.

Week Two (15-20/06/98)

I was hoping to catch up on the other science session this week, but have KiL on Thursday afternoon. June is also doing a lot of testing of her students and wants to leave science go for the moment. We are all having to prepare reports which although computer generated, still take approximately an hour per report. I have spent the last two weekends on them and am over half way through. I want to try to complete them by the start of the school holidays.

RB, the principal, spoke to me about running an extension science program for next term, focussing on grade 2,3 & 4 children. I had already committed myself to taking the
grade six for human anatomy, so said that I would think it over. Staff, Unit and School Council meetings this week.

Issue - Obstacles which result in the postponement of the science program - other school commitments which must take priority.

Issue - Pressure to take on other 'science' activities as I am recognised as the science enthusiast at school.

Week Three (22-26/06/98)
June is still continuing with her testing, and I have my last KiL session this week. I am glad that it will be finishing although I have gained a lot of knowledge from the sessions. The 'homework' tasks have added an extra load as well. There are still two science sessions scheduled for this term, so JM and I will need to decide whether to try to pick them up next term or just continue with next term’s program. We have run out of time.

6.4.6 Buddy Science Practical - Light 16/07/98

Results
Students were very interested in all aspects.

My Comments
It was difficult to assess their learning as answers were varied in degree of complexity.

Observations by associate JM
Through the use of a light source, Coral was able to demonstrate the concept that light travels in straight lines. She then explained several tasks to the students which they had to try themselves. Of these activities, the one using a pencil to produce a shadow and challenging them to bend the shadow with a clue given about using a corner, was very much enjoyed, and all the children were fascinated when they were called to observe the discovery by one child who discovered how to bend the shadow around the corner of the toilet block. The demonstration of using a magnifying glass to make paper burn had
every child concentrating well. It was winter when this experiment was carried out and the concentration of the sun’s rays took longer than anticipated but it was eventually successful. This was a very good lesson which kept all children interested and provided good interaction between the age groups. For the younger children it helped to explain to them the power of the sun which fitted with their sun smart knowledge.

Comments by associate JR

Why was it difficult to assess their degree of learning? If the discussion had a focus on ‘what did you learn today?’ Then you should have been able to compare the difference between their original discussion points and what they added. Perhaps a sheet written up to record their original responses, a list of questions of things to look for, and then a checking and adding system used in the final discussion stage. The activities seem more manageable for a large group of children. Did you find this?

Additional Comments

Very relevant questions posed by JR. When I commented on the degree of difficulty in assessing students’ understandings, I was referring to the individual. I am constantly aware that reports have to specify exactly what each child has learnt, not what the grade has learnt or what has been taught. Targeted questions can help, but in a group that size it is difficult to gauge the understandings of all students. Generalisations can be made about the group as a whole and about some individuals but not each and every student.

Issue - Constant awareness of ‘standards’ required in reporting and in assessing what students know.

Week One (13-17/07/98)

Extract from Journal 13 July:

JM asked if I wanted to do science this week and I said yes because were still three down from last term. In addition, she had commented on the area of light in her reports and we hadn’t done it yet. It has been difficult to maintain the science practical sessions, mainly because of the KtL training which clash with the Thursday afternoon sessions. We decided to use the first two weeks for science as the third week is to be taken up with
KIL again. Great news! J… has been put on medication for Attention Deficit Disorder. What a change in his behaviour.

*Issue - Classroom management dependent on students with behavioural problems (social and medical) and Integration student.*

I spoke to RB about the science extension class and together we decided that it couldn’t start for several weeks do to the congested timetable and my other commitments. Meetings this week include staff, School Council and unit meetings and a half day at the Mathematics Association of Victoria conference MAVRIC on Friday.

6.4.7 Buddy Science Practical - Sound 23/07/98

*Result*

The children really enjoyed their experiences and were able to generate sound using a straw.

*Conclusion*

Another good experience for all students and through discussion I could assess that all students understood about vibrations creating the sound.

*Observations by associate JM*

The children enjoyed all aspects of this activity although one child tested their tuning fork on a glass and managed to shatter it. This gave us the opportunity to talk about vibrations, the reason the glass shattered and the dangers of broken glass. The end product of the straw kazoo was a hit with all children and left all buzzing! I believe the children really understood the concept of sound waves and vibrations through this session.

*Comments by associate JR*

I’ve tried gum leaves. Hair combs with greaseproof paper is a great way to do this. The children can feel the vibration on their lips. Rubber bands stretched to different lengths, small pieces of tissue sitting on a drum surface, an old turntable can be used to play
'music' - put a pin into a light piece of card and use that as the needle. After we tried
different experiments we made a band. Went outside and played Christmas songs (the
neighbours didn’t mind too much!)

Additional Comments
JR’s comments again highlight the difference between taking science on a sessional
basis as we did, and having the advantage of being able to develop a concept as a
classroom theme. Ideally, all teachers should be able to do it this way, but many don’t
and that is the dilemma.

Week One (20-24/07/98)
PD Coordinators’ meeting on Monday afternoon was postponed until next week. This
is a bother as other staff are doing midyear interviews this week and I cancelled mine
until next week. It’s too late to change back again. Now I’ll have to rearrange
everything again.

Week Two (27-31/07/98)
Monday is a busy day. I have students until twelve o’clock, parent-teacher interviews
from twelve until one thirty, PD Coordinators’ meeting at Corio Community College
from two until four thirty and then back to school for more parent-teacher interviews
from five until seven thirty. I’m a little annoyed with RB, as he said that he would
arrange a meal for me. He forgot. On Tuesday, I had the final session of the KtL
training with a guest speaker in the morning. RB attended. I was hoping he was
listening as the speaker, Carmen Crevola commented that the foundations of learning
were literacy, numeracy and science. It seemed that here was another forum that
science was being recognised, but not yet at the school level. After the lecture, I asked
RB if he had heard the comments. He indicated that he had but could not see how we
could accommodate science at school at the moment. I want him to realise that science
is not just ‘my’ interest, that in fact, many educationalists were lamenting the lack of
science teaching in primary schools.
6.4.8 Buddy Science Practical - The Weather 6/08/98

Results
I forgot to give out the weather chart for the second part of the week. Had to leave it for another week before completing. I haven’t asked June either whether her students did the follow-up as well.

Conclusion
This was really revision for most children, although the preps may have gained the terminology for some of the weather conditions. The children seemed to enjoy doing something which they already had some significant knowledge of.

Observations by JM
This particular session was not particularly successful due to the fact that during a very busy week following the session I failed to help the children keep the weather chart. I did, however, follow this session up a few weeks afterwards and kept check of the weather patterns as a whole grade rather than individually. Aspects that were looked at were days that were sunny, cloudy, windy, overcast and rainy.

Comments by associate JR
Useful if you have a set time of day for doing this. Perhaps a monitor system for checking the temperature. That way the kids remind you and have ownership. Extend to language activities - make a TV show with children giving the weather report. Tape them or show a tape off the TV and get children to talk about what they heard. Graph the temperatures predicted and compare with your readings. There are lots of great stories about weather so it could be a whole weather week culminating with talking about rain/frogs and making ‘Frogs in the Pond’ to celebrate.

Additional Comments
Again, some great suggestions from JR, particularly taking weather as a classroom theme. Perhaps this is something that could be considered, although at Maxwell PS we have set themes that we are meant to choose from. With more appropriate unit planning
for themes, some of these ideas could be more fully implemented. Unfortunately, in the last year, we have lost our team planning times as the budget has been cut back severely. I was also disappointed in myself for forgetting the ongoing report and the follow-up in class. There seems to be so much going on that things like this get overlooked.

_**Issue - Budgetary constraints have meant the loss of our 'once a term' planning time which I found invaluable for theme development and collegiate planning.**_

Week One (3-7/08/98)
Over the weekend, I started to think about mounting a review of science teaching at Maxwell PS. I'll need Rob's support to overcome some of the negativity. I missed staff meeting this week as I had to attend another inservice. Also had my mid-cycle PRP review during my preparation time this week. Although I tried to keep the time to the barest minimum, it still took over half an hour. On Wednesday, I started the extension science program with the grade 2, 3, 4 students. One of the parents spoke to me on Friday, commenting on how much her daughter was enjoying the science class.

Week Two (10-14/08/98)
Apart from staff meetings, I took up a classroom science/technology concept of how things move. I am particularly looking at the movement of bicycles and have made a booklet of activities to complete with the students over the next few weeks. Our buddy activity this week was prepared by JM and dealt with littering. I also had an interview with one of the parents who had missed out on Parent-Teacher Interview day. She spoke to me about the science program, praising it and me.

Week Three (17-21/08/98)
I spoke to RB about the positive feedback I was receiving from parents. He was pleased but wouldn't commit more than that. I have to miss the staff meeting again tonight as I am running the Regional Science and Technology KLA Network meeting at school. I chose to do a number of chemical experiments which I had done at Poppy Kettle the year before. They all worked really well. Unfortunately only seven attendees, despite sufficient notice of the meeting. I used some of the same practical experiments for the
extension science group and they were very enthusiastic. Again, one of the parents
spoke to RB in praise of the program. Meetings this week include unit meeting, School
Council, and a half day inservice on KIDMAP.

Week Four (24-28/08/98)
No extra meetings this week. Extension science program did copper coating of nails.
JM too busy for science this week. We are now well behind.

6.4.9 Buddy Science Practical - Day and Night 3/09/98.

Results
Students participated actively in the discussions and raised some interesting information
themselves.

My Comments
It is difficult to assess whether the younger children understood the concept of the globe
representing the Earth. If they did, then they would have understood day and night. If
they didn't, then subsequent discussion and demonstration would have been of no value.

I find these topics very dry for younger students, with very little practical content which
allows conceptual development.

Observations by associate JM
This was not an easy topic for younger children, and I found that follow-up activities
concentrated on nocturnal animals and things which families would normally do during
the day and night. The children understood the fact that at night the stars and the moon
shine and that the sun shines during the day, but I do not think that the Preps understood
the rotation of the Earth over a 24 hour period. This concept is a difficult one for such
young children.
Comments by associate JR
I agree! (with Coral’s statements) Have tried this and wondered if I had wasted my
time. O.K. to present the information, it adds to a continuing understanding of the
physical nature of the world. Why should we really worry that every child understood?
They will eventually if it gets presented lots of different ways to them as they grow.

Additional Comments
Week One (31/08/98-4/09/98)
Apart from normal meetings this week, I had an additional meeting with JR, discussing
her approach to science within her classroom. My class is having a bike day at school
on Friday which has involved quite a bit of extra planning. Extension science did design
and building a cereal box.

Week Two (7-11/09/98)
We have ball game sports this week. This has involved the children in practice for the
last four weeks and in a half day competition on Tuesday where they compete against
teams from seven other local schools. We had a pupil free day on Wednesday. On
Thursday, the extension science group made their cereal, tasting and evaluating it. I
have really enjoyed working with the older children compared to the younger ones.
‘I’m not sure if its the number of students (hence organisational hassles with equipment
etc.), the topics, or the age of the students.’ Journal entry September 10, 1998.
We had a Junior School excursion to Wambidgee Farm today. A great experience for
all concerned.

Week Three (14-18/09/98)
No science this week due to end of term activities and follow-up on Wambidgee Farm
excursion. I did spend some time speaking with JM about the topics for last term. In
fourth term, I had planned to deal with topics related to living things, however, JM has
been doing animals with the farm theme and an environmental theme. She believes that
we should leave animals for a while. We decided to do the senses and over the term
break, I would think of a number of other science experiences. Meetings include
School Council as well as unit and staff meetings.
**Term Four**

After discussions with June about the intended science lessons for this term, we decided to abandon the lessons I had devised at the start of the year. Primarily because she was also going to run with a theme of animals (farm animals, and endangered Australian animals) and thought that animals in science might be overdoing the theme. I was a bit disappointed because I had chosen the topics to fit in with the school theme at that time. However, it is important that children gain from this experience. I am also sure that June will tackle the science aspects of both her animal topics when she does them. It is probably better that her children study animals in this way than as a once a week lesson. I wish all teachers had June's science interests so that it became part of their ordinary lessons.

**6.4.10 Buddy Science Practical - Colour 16/10/98**

This lesson was chosen to finish off the previous term’s work on light and dark. I connected this lesson to that of light.

**Results**

Some children understood about light being needed for colour but the concept was too difficult to follow for some children. I think it is worth persisting with difficult concepts as it gives extension to children who are able to think in that way. When it came to mixes, some of the grade twos were able to recognise the prime colours and their mixes. Not all, however.

For Preps it was a new concept. Children enjoyed making new colours but those with textas were less successful due to depth of colour of texta. This creation of a problem (predicted by teachers before the lesson) was a good way of checking children’s problem solving skills. Again, some were able to work out why they had difficulty, others needed some help.

**My Comments**

Overall a successful lesson, with some children being extended.
Observations by associate JM
The fact that colours can only be seen if there is light is a difficult concept for Preps, but Coral related this well to the previous topic of Day and Night. Coral used cellophane mixes against the light of the window to show the children how different colours can be made from the primary colours. We also used paints to mix colours as a demonstrations. Children were then set to the task of colour mixing with pencils and crayons. They enjoyed this activity and worked well together, sharing their discoveries.

Comments by associate JR
I agree! (with the comment about persisting with difficult concepts to extend some children)

Additional Comments
Week One (12 - 18/10)
Started science with grade six this week. Journal entry ‘...so much more interesting than following the CSF schedule.’ Meetings include Unit, Staff

Week Two (19 - 25/10)
Meetings this week include, School Council, PD for Accreditation 20/10, Kidmap 2-4pm 22/10.

Week Three
Meetings this week include Swimming meeting 27/10, PD Coordinator’s meeting 27/10

6.4.11 Buddy Science Practical - Snails 5/11/98

It was decided to consider one lesson on mini-beasts rather than discard the whole area of animals.
Results
Children's knowledge of snails varied greatly, but all enjoyed hunting for them and locating their habitats. Children were all able to observe snails closely, even those students who did not want to touch them were still able to observe.

Conclusion
Children's knowledge and understanding of snails was demonstrably better after the practical session.

Observations by associate JM
This was my favourite lesson, and the children thoroughly enjoyed this science activity. Coral first found out what the children knew about snails and their various parts, and then split the class into groups and sent them on a snail hunt after discussing possible habitats. There were squeals of excitement as specimens were collected. We brought them back to the room to observe them closely, looking for various physical features, particularly the breathing hole. The lesson was rounded off with a snail race across wet concrete, with lots of barking from the children. It was a great lesson.

Comments by associate JR
A potentially dangerous exercise if there are no snails lurking in the school garden. Did you check first.

Additional Comments
Not only did I check to see if there were snails in the school garden, I made sure there were plenty by bringing some in from home.

6.4.12 Buddy Science Practical - Senses 19/11/98

Results
We ran out of time to discuss this as a group at the end. The following day, I asked the grade twos what they had thought and was able to determine that they understood most
of what they had participated in. Unclear about Preps without further discussion with them. I hope JM does a follow-up.

Conclusion
Time was extremely tight, lesson was shortened to one hour so the number of activities was extremely ambitious. Hence not enough discussion time. There was not enough time at the start to discuss things other than the organisational arrangements and a general classification about the senses. Helpers all commented on lack of time to develop the concepts properly. Next time need to extend over two or more sessions.

Observations by associate JM
This was an ambitious activity. It is never easy to organise two grades of infant children rotating around four different activity stations. Unfortunately we ran out of time to discuss the activities as a group at the end, but in subsequent discussion with the Preps, they did seem to understand most of what they had participated in. We probably needed to work on this theme over three or four lessons, to allow time for the children to complete the activities and discuss them and draw conclusions from their experiences.

Comments by associate JR
(There seems to be a lot of things planned for ‘sight’ and one activity for the senses. Also the time factor of 5 minutes x4 doesn’t add up to me as you say you ran our of time in 60 minutes.) In classroom activities I have linked taste, smell and sight (of food) together as they are interrelated. Hearing and touch are more separate. The hearing could have been related to the lesson you did on sound vibrations.

Additional Comments
Hindsight is a wonderful thing! This was far too complex to be handled in the one session. It really was a ‘fitted in’ lesson as we had originally intended to look at the senses as part of the animal theme.

Meetings this week include School Council on 17/11.
6.4.13 Buddy Science Practical - Fossils 15/12/98

Results
Students needed help with the practicalities of the task such as getting the consistency of the plaster correct before pouring it, and setting up their ‘fossil’ shape in plasticine. The casts needed several hours to dry, but turned out very well. Discussion had to be delayed due to casts not drying sufficiently in an hour (most children had made theirs too moist). I (Coral) also had a meeting that afternoon which precluded further follow-up discussion.

Conclusion
Children experienced making casts and gained in their knowledge of it as a scientific tool. However follow-up was very poor again. Lessons are too rushed and not developed fully. Is this a time factor, a factor of trying to fit in too much, lack of knowledge on my part about Preps capabilities - what is it?

Observations by associate JM
The Preps absolutely loved this activity, even though there were some practical problems such as putting too much water in the Plaster of Paris. This fossil session was conducted in the week before school broke up, when Christmas madness was upon the children, and yet they listened carefully to Coral’s explanations, were very interested in the fossil samples she had, and were able to successfully follow the direction and make their own pseudo-fossil. If it hadn’t been the last week of school, follow-up sessions such as footprints in the sandpit would have further developed the theme. Well done, Coral. I dips me lid!

The series of science activities planned by Coral over the year were excellent as she managed to make some topics which young children could find uninteresting, attractive and stimulating. Coral’s understanding of the CSF and her scientific background are an invaluable asset at our school.
Comments by associate JR

Was this a one-off lesson or were looking at dinosaurs as a classroom theme perhaps? I would only attempt this with lots of helpers. We did this lesson (grade one and just me) last year but it was part of our 6 weeks of looking at dinosaurs. It was messy and I mixed the plaster and poured it so there was some control over the mixture and the plaster used (adding salt to the mix can speed up the drying time I have heard). The children made their own shapes to pour into (maths making shapes from nets) and we used sand and found objects like leaves to get an authentic fossil. This followed a lot of discussion about how fossils are made and then the children called themselves paleontologists and so the activity had some relevance. An hour seems like a very short time for discussion, making a mould and expecting it to dry. I was able to extend this activity (in short bursts) over several days.

There seems many advantages to running a Science program through a classroom situation. I have become aware as I read your lesson comments as to the advantage of being able to follow up activities and to extending areas of interest if the chance arises. What concerns me when taking mixed-aged activities on a regular basis for science (or any topic) is the difference between a Prep’s ability to conceptualise compared with a grade two child who one would assume had more prior knowledge. Did you find it difficult to find activities that provided opportunities for exploration and extension? A lot of this would have occurred in the small group discussion work but that then is dependent upon the facilitator.

Additional Comments

I was glad to finish the science buddy program. Overall, I have been disappointed with several aspects of it. The time factor was the single biggest problem. Never quite enough time to finish or fully develop themes. There are certainly good features to running a collaborative program but it also presents its own unique problems.

Only one additional meeting this week - School Council 15/12
6.5 ISSUES ARISING DURING THE ACTION RESEARCH PROJECT

At the completion of my year's work, I considered that the action research project had been unsuccessful. The main contributing factor was the lack of time to collaborate effectively with others. Since completing the project, and with time to consider aspects of it more slowly, I am starting to gain an understanding of what went wrong and how I could have improved the action research. The 'reflective' aspect of this project has come much later, long after I had decided on its failure. If I was to try again, there are some things I would change. However, there are some factors which I couldn't change and these issues have been identified as playing a significant part in the lack of success of my action research project. These issues intermesh with the broader picture issues and need to be considered alongside those. A broad brushstroke of these issues will be discussed in chapter seven, followed on in chapter eight with specific relation to science teaching.

**Issue** - the difficulties that arise in trying to collaborate with other teachers due to other demands on time and effort.

**Issue** - How does Constructivist Theory relate to my teaching practice and the ensuing problems I have in incorporating it into the lesson?

**Issue** - Communication between staff is poor, despite being a small school with low staff numbers

**Issue** - Time and effort required to organise the science sessions are greater than I expected.

**Issue** - Lack of collaboration is a problem as I can't get the feedback I expected on these lessons.

**Issue** - Morale of teachers is low due to continuing changes and pressure to adapt to changes.

**Issue** - Obstacles which result in the postponement of the science program - other school commitments which must take priority.

**Issue** - Pressure to take on other 'science' activities as I am recognised as the science enthusiast at school.
Issue - Constant awareness of 'standards' required in reporting and in assessing what students know.

Issue - Classroom management dependent on students with behavioural problems (social and medical) and Integration student.

Issue - Budgetary constraints have meant the loss of our 'once a term' planning time which I found invaluable for theme development and collegiate planning.
CHAPTER SEVEN

EFFECTS AND IMPACTS OF STRUCTURAL AND POLICY CHANGES

This chapter will discuss the effects of the structural and policy changes occurring in Victorian education. It will summarise the content and findings with relation to the professional context. The four main issues identified in chapter two, workload, power relations, curriculum and teaching role, security and morale, will be addressed. Specific examples within my own school will be used to indicate the impact of those issues at the school level.

7.1 PREAMBLE: RECAPITULATION OF STRUCTURAL & POLICY CHANGES

The overarching philosophies that have affected Victorian government schooling and education in the last seven years are those of decentralisation and devolution. Responsibility of decision-making and fiscal management has moved to the individual school setting. As explained in chapter one this is a part of a much bigger picture - that of the global market economy where most prominent Western governments are following similar paths of economic rationalism. There has been a deliberate attempt to withdraw direct government involvement in the provision of goods and services. Market enterprise, whereby institutions generate their own revenue through competition and performance outcomes, is believed to be superior to other forms of administrative coordination.

The direct impact of this on the international educational scene can be found in the major reforms undertaken by educational authorities. Schools have become accountable for the management of their resources and the outcomes of student achievement. By fostering a system of competition between schools for student numbers, it is believed that schools would have to improve or close. Education, like many other government enterprises, is viewed as a market commodity to be subject to free market trade.
In Australia, from the early 1980s, there was a substantial commitment to decentralisation. This manifested in schools as the devolution of authority and responsibility to school councils. The dismantling of the education departments into ‘small strategic core’ facility was another aspect of reform (Beare, 1995, p.14). The central core is physically unable to control schools in the traditional sense, rather its task is that of coordination:

It is responsible for strategic decisions, for long-range planning; for negotiating and parcelling out the education budget; for instituting quality controls; for managing the Minister’s office. Around Australia, system after system, we are witnessing reconstruction of this kind.

(Beare, 1995, p.14)

Victoria was also committed to decentralisation and followed the lead of the other states until 1992 when the newly elected Liberal-National Victorian State Government came into power. From that point, on the rate and extent of change exceeded those of other parts of Australia. Arguing that Victoria could not afford its current education system, various measures were introduced to reduce the amount of money being spent on education. The first obvious changes were structural. School sites were rationalised, with principals and community members placed into task force groups to assess the viability of various schools. It was an onerous task. Schools were forced to close or merge with nearby schools. Nor did it stop there. Over the five year period from 1992 to 1996, schools were continually targeted for closure. Initially, very small schools were closed, then schools with less than 100 students were closed. Next, schools with enrolments of less than 150 students were closed until finally the closures ceased at schools where enrolments were between 150 - 175. If school enrolments dropped significantly below this figure, then they could expect to be closed down as well. In an article in Learn (Herald Sun, 3 March 1998), according to Department of Education figures, over 315 schools were closed or merged over that period.

As well as the school closures, came the reduction in staffing. School cleaners were told to reapply for their jobs under a contract system and some teaching staff became ‘over-establishment (OE)’. The DoE set a new ratio for the number of staff to be
employed at any school and the principals had to name staff who were redundant to the school's needs. Essentially all specialist staff became OE. Those teachers named in excess were offered large inducement packages to encourage them to leave the teaching service. Although nobody was actually sacked, there was a stigma associated with being named OE and many teachers took the redundancy package rather than waiting to see if sacking was the next step.

Over this time of uncertainty for schools, the DoE was trialling the 'Schools of the Future' (SOF) program in pilot schools. This was officially offered to all schools in 1994, although it was implemented in stages across several years. The DoE defined the program as both the process of change and the schools in which the processes were undertaken. SOF were modelled on the concept of self-managing schools which had been earlier introduced in Britain, America and New Zealand. Essentially the school was to take greater responsibility for the delivery of the prescribed curriculum, for student achievement, for the fiscal management of the school and was to be held more accountable in these areas. The new policies started arriving at schools with documents relating to:

- The Quality Provision Framework;
- School Charters;
- School Global Budgets;
- District Structure;
- School based Personnel Responsibilities;
- Broad Policy Framework;
- School Councils;
- Schools of the Third Millennium;
- Curriculum and Standards Frameworks;
- Learning Assessment Project;
- Staffing; and the
- Professional Recognition Program.

All of these factors have been discussed in detail in chapter two but a brief summary of each follows.
Quality Provision related to the supply of a new curriculum, improved facilities and increased community input (Hayward, 1993). At this stage, the Curriculum and Standards Frameworks hadn't been developed although the National Curriculum Statements and Profiles had. Hayward, whilst indicating lack of support of the National Statements, nevertheless promised a comprehensive ‘quality’ curriculum. Improved facilities were to be achieved by boosting the spending on capital works and upgrading existing facilities in schools. Certainly, this has been achieved slowly over the last four years to 1999, however often an individual school had to resort to taking its case to the media to gain the priority status needed for funds to be allocated for urgent works related to safety issues (Busfield, 1998). In May 1998, in his annual report on ministerial portfolios, the auditor-general, Mr Ches Baragwanath, called for additional funding for school maintenance. ‘Victorian schools...are in urgent need of upgrading...’ He called on the Education Department to reassess its funding formula to ensure ‘minimum health and safety standards are maintained’ (Borcham, 1998).

The School Council was reconstructed to increase parent representation and other government initiatives have included parent participation as part of the philosophy of the learning path. For example, the Early Years Literacy and Numeracy Programs both address Parent Participation as one of the four main thrusts. Parents have always been involved in their children’s education but now it has become part of the ‘policy’ of education.

The School Charter is a document which states the objectives of the school in terms of its profile, goals and priorities, curriculum, budget, accountability and codes of conduct over a three year period. Strict guidelines are to be followed in the development of the charter and stringent appraisal is given to the document by the DoE before it is accepted. The school charter specifies how it will achieve its objectives and an ongoing assessment procedure is put into place by the school. Documentation is collected to support the school’s management of its charter. At the end of the charter period, a major review called a Triennial Review is undertaken by the school to justify its approach over the previous three years and to assess the data to indicate future directions. Again the Triennial Review Process has to be ‘rubber stamped’ by the DoE.
The school charter is an effective document with school charter priorities being considered in all aspects of school management.

**Global budgeting** is the term applied to the fiscal management of the school using strict DoE guidelines with a designated pool of money. In theory, it gives schools greater control over how money is spent. In reality, schools are finding it difficult to manage all their needs within the budget and must increasingly turn to the school community for fund-raising or 'voluntary' fees.

Changes to **district structure** are often not immediately apparent to teachers in schools. However, the changes are now so significant that all teachers would be aware of the parring down of support structures to the barest minimum. Apart from the Regional Manager, a few curriculum consultants, a few support staff and administrative staff, the Regional Office has become a shell. This has been accomplished slowly over the last five years and the staff have been absorbed back into school-based situations. With the down-sizing of these support mechanisms, teachers are unable to supply students with additional professional assistance and in fact, some parents are being advised to consult private providers to give their child the best chance of success. Many parents cannot afford the cost of private consultants but are in a quandary about the best way to help their children.

The **administration of personnel files**, salaries, leave and other allowances has now become a school concern. This is part of full staffing flexibility that also allows the hiring of staff under DoE guidelines. In reality, this has meant a huge workload increase for the principal and office staff, without any additional resources being made available to the school. Positive aspects are obvious in that teaching staff can access administrative records immediately through the office staff and many administrative requirements have become more streamlined. Despite its promises, full staffing flexibility is not yet working satisfactorily - primarily because the DoE has altered the original conditions. Very stringent employment requirements have been introduced which can interfere with a school's choice of applicant.
Schools are operating under what is known as a **Broad Policy Framework**. This takes into account four sub frames, curriculum, people, resources, and accountability, all of which will be dealt with elsewhere in this preamble.

**School councils** are an enduring part of all schools. In more recent times, the decision-making and power of school councils have increased dramatically. School councils are involved in many more aspects of school management from global budgets to school charters. All of their responsibilities are guided by DoE documentation.

The legislation for **Schools of the Third Millennium** (SOTM) was passed through parliament in April 1998. Schools were then invited to enter into this new arrangement which would essentially give schools control over their financial and staffing management. School councils would be able to form business links with commercial industries and be able to hire and fire staff. Schools would still be globally funded and would still be accountable under the previous system. Although some schools have shown interest and become SOTM, most have decided on a 'wait and see' attitude. Due to the fact that schools will be funded for staffing on the basis of an average salary multiplied by the number of staff allocated for the student numbers, most schools with more mature staff would be seriously disadvantaged by this arrangement. The lack of positive response on the part of school councils has prompted the DoE to run a series of promotional workshops around Victoria. There was one held in Geelong on 23 July 1999. Our school principal, once reticent to comment much on SOTM, returned from the workshop abuzz with the opportunities offered by SOTM.

The **Curriculum and Standards Framework** (CSF) document is a series of smaller books which provide the guidelines and accountability structures of Victorian curriculum in eight specified learning areas. Within each key learning area (KLA) are seven levels of achievement which span the school years from preparatory to ten. Each KLA has a number of strands or themes and is further classified into sub-strands or minor themes. Each sub-strand has specified student learning outcomes. Although suggested as a guide only, the CSF is so prescriptive that teachers find little room for personal input. Measuring student achievement against benchmarks or outcomes statements was also
something new to come to terms with. In all aspects of teaching, be it planning, teaching or assessing, the CSF has added a huge load to teachers. At this time, CSF 11 (draft) is being reviewed in schools, although the consultative process was relatively short (April to June 1999). In this draft document, identified problems such as the crowded curriculum and teacher workload have been partially addressed by reducing the number of strands and sub strands and by simplification of the strand titles.

As part of its accountability thrust, the DoE has imposed the Learning Assessment Project (LAP) on all state primary schools. Despite huge initial opposition, the LAPs appear to be here to stay. They are still considered to be of little educational value by teachers, parents or educational theorists, but can be used to supplement the teacher’s own assessments. This year (1999) for the first time, the LAPS tests were undertaken in August, not earlier in the year. Teachers thought this was due to the fact that they had commented on the value of tests undertaken so early on in the academic year. Not so! The LAPs test this year incorporated the national tests so that Victorian student results could be compared with those of other states.

Over eight thousand teachers left the teaching service in the years 1993-94. They were encouraged to take early retirement or redundancy by the introduction of extra payments (redundancy packages). School staffing numbers were drastically cut by about a quarter, although larger schools were better off due to the funding formula allowing further benefits for schools with enrolments over 200 students. Most schools lost their specialist staff, or to retain them had to accept much larger class sizes. With global budgets, schools are now hiring specialist staff under contract, and use school funds to pay for teachers who once would have been supplied through normal staffing channels. This reduces funds for other school items and impacts on other aspects of school life such as fund-raising, school fees, voluntary support, school promotion and establishing links with businesses.

The Professional Recognition Program (PRP) is the current career structure for teachers in the state school system. Promotional opportunities are based on merit and the acceptance of more responsibility. Schools determine the number and speciality of
promotional positions required and must seek to fill them from anywhere within the state teaching ranks. The positive aspects are that younger teachers can move up the ranks more quickly and that merit may be recognised. The negative aspects are that teachers have to be prepared to sign limited tenure contracts, must be prepared to work even harder in an already overloaded profession, and must be prepared to promote DoE initiatives (as this is the area that most promotional positions are available).

All of these factors have contributed to the changes in teaching practice evident in schools. In the following sections, I will be commenting on the effects of these overarching changes in the professional context of schools in general, to my school in particular, and then specifically to my own teaching practice. Focussing down even further, I will provide an insight into the constraints to professional development in my science teaching practice, despite concerted efforts on my part to rectify the situation.

7.2 INCREASED WORKLOAD IN THE PROFESSIONAL CONTEXT

In 1993, the Cooperative Research Project (Assessing the Impact) was established to track and study the Schools of the Future Program (SOF). It was a joint venture of the Directorate of School Education (now the Department of Education), the University of Melbourne, the Victorian Association of State Secondary Principals (VASSP) and the Victorian Primary Principals Association (VPPA). Undertaken over five years, the study included both broad surveys and focused investigations. The final (and seventh) report was conducted in late 1997, and the results released in 1998. The surveys were conducted across a representative sample of schools over the SOF intake years. Over 829 schools were selected with responses received from 504 (60.8%). Principals were the target group of the surveys. Information was sought on a huge range of individual items specifically relating to SOF. In the last survey, principals were asked to comment on the single most significant impact of the SOF program on the students, teachers and themselves:

For the impact of Schools of the Future on teachers, the largest response concerned workload with 45.8 per cent of principals commenting on some aspect of workload as impacting on teachers.
(Thomas, 1998, p16)
The issue of teacher workload has been identified by principals as the single most significant factor for teachers under the SOF program - not curriculum, not change nor the rate of change, not professional development, not budgetary concerns nor new administrative tasks, but workload! Within its own document (*Assessing the Impact*) the DoE has acknowledged the concern raised by principals.

This problem of excessive workload of teachers was identified in earlier surveys of this project. Of the seven main problems identified by principals, four of them related to workload of administration staff, principal, teachers in key responsibility positions and other teaching staff. The 1998 report went on to state: 'That this pressure is not easing remains cause for concern'.

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<tr>
<td>Workload/time demands on teaching staff</td>
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<td>4.6 4.7 4.7 4.7</td>
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<tr>
<td>Workload/time demands on administrative</td>
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<tr>
<td>staff in key responsibility positions</td>
<td>1 1 3 26 69</td>
<td>4.6 4.6 4.6 4.3</td>
<td></td>
</tr>
</tbody>
</table>

(Extract from Table 22, Thomas, *Assessing the Impact*, 1998, p.60)

From the data above, it can be seen that there has not been a diminishing in the concern over teacher workload. In fact, for general teaching staff there has been a slight increase in the principals' perceptions of teacher workload so that now teachers with or without extra responsibility positions have similar results.
The report went on to outline the issues which principals believed were increasing teachers’ workload. These included: increased tasks and responsibilities, increased accountability, implementation of CSF, decrease in level of resources (financial, human, physical), increased financial responsibility, increased demands from parents and community groups, introduction of other DoE initiatives, increased class sizes and teaching in non-trained subjects (Thomas, 1998, p82 & p85). These will be discussed in more detail following.

Whilst it has taken the DoE several years to acknowledge the increased workload on teachers, others have noted this several years ago:

...teachers in Victoria generally work long hours which include substantial working time outside of school hours and their workload has increased significantly over recent years.
(Australian Industrial Relations Commission – AIRC, VSTA News, Feb 27, 1995, Vol.16 No 4, p1)

Back in 1993, with the dismantling of the state award system, teachers had to battle to retain their existing work conditions. This was accomplished by swapping to the federal system of awards and establishing an interim award on 15 December 1993 (operative from 1 June 1994) until the full award was recognised (Victorian School Education News, Vol. 1, No 20, 18 Nov. 1993). The DoE (formerly the Directorate of School Education, DSE) fought this at each and every step, by appealing decisions and offering solutions which were less than satisfactory to teachers. The DoE wanted to introduce Individual Employment Agreements and while they advocated that they had no wish to erode teachers conditions of employment, they were adamant that individual agreements would protect the rights of the teacher but provide for further flexibility at the workplace. Unless the conditions of employment were written into each individual work agreement, I really cannot understand how the employment rights of teachers could be protected. The AIRC brought down the Teachers’ Award on 1 June 1994 which covered hours of attendance and duty, qualifications for appointment, salaries and leave (Lord, 1994b, p1). The teacher workload case began in the AIRC in October 1994.
Barrister, Mordy Bromberg, representing teachers through the FTUV and the VSTA, stated:

What teachers do in front of the classroom is but the tip of the iceberg of a teacher's workload. Much work is done at home. This is not the sort of industry where the whistle of the time clock determine the hours of work of the employee.

(Lord, 1994a, p1)

Late 1994 until mid 1995, there was a stalemate between the DoE and the unions (Victorian Secondary Teachers Association and the Federated Teachers Union of Victoria) regarding the workload agreement (Bluett, 1995, p1). The AIRC had required the unions to be involved at the school level to help define 'an unreasonable or excessive workload' (AEU News July 14, 1995, Vol.1, No 1), however the DoE refused to negotiate with the unions stating the 'the determination of an individual teacher's workload is a matter for the principal' and that 'there is no need to define teacher workload' (Bluett, 1995, p1). In this period (Feb-July 1995) at our school, the principal took advantage of this time of uncertainty. Although previously teachers had been allowed two and a half hours preparation time each week, there was no longer enough money to support that allowance. We were reduced to one hour's preparation time and there were times when even that was impossible. Not only that, but the principal attempted to shorten the lunchtime which would have increased our face-to-face teaching time from twenty-four hours per week to over twenty-five hours per week. We compromised on the shorter lunchtime and ended up working an extra half an hour per week. To the staff at our school, this was sufficient proof of what could happen if we weren't adequately covered by an award. When the workload negotiations were finally resolved and teachers were given their full preparation time, somehow the principal managed to find some extra funds for support and even took over a small teaching load himself. We still only had two hours time release per week.

The AIRC approved an award known as the Teachers' (Victorian Government Schools) Conditions of Employment Award 1995 on 11 July 1995 (Lord, 1995b, p1). This was brought into effect on 17 July 1995, except for the clause on primary face-to-face
teaching hours which took effect from 30 January 1996. The main features of the award stipulate:

- The maximum face-to-face teaching hours for secondary teachers will be 20 hours per week, except where if taking two hours of sport where the maximum is 18 hours 40 minutes;
- The maximum face-to-face teaching hours for primary teachers will be 22 hours 30 minutes per week (from 30/1/96);
- The definition of face-to-face teaching includes curriculum or pastoral functions involving student supervision, counselling and consultation;
- Where a teacher is aggrieved about their workload, or the union is aggrieved about the workload imposed by the employer, grievance procedures can be activated;
- The grievance procedures are designed to settle the matter at the school level, or failing that, by the DSE and union through a conciliation process;
- If after 5 days a grievance remains unresolved the union may refer it to a Board of Reference;
- The Board of Reference has two union nominees, two employer nominees and a member of the AIRC as Chairperson; and
- The decisions of the Board are binding.

(Lord, 1995b, p1)

In June 1997, the DoE again tried to change the Teachers (Victorian Government Schools) Conditions of Employment Award, and the Teachers (Victorian Government Schools-Interim) Award. The DoE wanted to ‘simplify’ the teachers’ awards under the transitional provisions of the federal industrial relations legislation. The awards would only contain twenty allowable matters (AEU Bulletin, 4 June 1997). From the Conditions of Employment award, the DoE wanted to remove:

- Board of Reference;
- Leave reserved matters;
- Teacher Workload;
- Teacher Sabbatical;
- Grievance Procedure;
- Incremental Progression and Performance standards;
- Leading Teacher Progression;
- Restriction of deferral of increments;
- Length of LT2 & 3 appointments; and
The DoE wanted to remove another 26 clauses from the Interim Award relating to a wide selection of conditions ranging from study leave to hours of attendance. Although recognition for teachers’ increased workload was a growing concern in other areas of the community, the DoE was yet to indicate any real concern. In fact, to teachers it appeared as if the DoE really had no concerns for teachers as a professional group. The continuing onslaught on teachers conditions, the continuing introductions of more and more ‘initiatives’, the continuing demand on teachers to comply with radical changes to structure and policy were indications of a non-caring system.

The DoE stated that it wanted to remove from the award all those work practices ‘that restrict or hinder the efficient performance of work’ and that it wanted to ensure that ‘primary responsibility for determining matters affecting the relationship between the employer and the employee rests with those at the workplace or enterprise level’ (Murray, 1997, p1).

Over the next six months, unrest continued to surface in schools as the unions fought for a Certified Agreement on teachers conditions. The conditions described in the draft agreement were aimed at addressing teacher workload (Bluett and Glare, 1997, p2). Some of the issues specifically addressed were: recommended maximum class sizes, rostered teaching duties and Casual Relief Teaching duties/rates.

The award stripping and the Certified Agreement, although essentially dealing with the same matters were handled as two separate matters. One was an AIRC involvement, the other was based on negotiations between the DoE and the teacher unions. Some aspects of workload have not been specifically defined in our award. Class size has not been defined as according to the AIRC it ‘would not necessarily ensure that a teacher’s workload was fair and reasonable’ (Australian Industrial Relations Commission, VSTA News, Feb. 27, 1995. Vol.16, No. 4). This has continued to be a bone of contention as increasing class sizes has often been the only way schools can manage with their global
budgets. Inclusion of maximum class sizes within an award would have necessitated the DoE to supply additional funds to schools for additional staff (more about this later). Within the award, meeting times can be up to three hours per week if held adjacent to the school day, and 'other duties' can constitute up to fifteen hours extra per week. This includes things like yard duty, professional development activities, preparation and assessment tasks.

Details of systemic changes occasioning excessive workloads for teachers will be now discussed in more detail.

7.2.1 Fewer teachers and larger classes

Recent class size research is clear and unequivocal about the benefits of smaller classes, for all students, but particularly for those who are educationally disadvantaged.

(Lord, 1997, p6)

In 1993, amid the other changes, the DoE decided to reduce the number of teachers allocated to each school and the total number of teachers in the state school system. This was achieved in a number of ways. Firstly the teacher:pupil ratio was altered from 1:15.8 to 1:18.3 in primary schools and from 1:10.8 to 1:12.1 in secondary schools (Howells, 1998, p19). From being one of the best ratios in Australia, it became one of the worst. Included in this figure are the principal and any specialist staff which effectively alters the actual number of students per classroom teacher.

Secondly, teachers were named as being over establishment and these teachers were offered places at other schools or redundancy packages. Over eight thousand teachers left the service without being replaced (1993-1998). Teachers with specialist skills in areas such as art, library, science or physical education were either transferred, placed into a classroom or lost from the system through redundancy.

With fewer teachers for the same number of students, schools tackled the problem in one of two ways. The choice was:
• to retain staff as specialist teachers, thus giving classroom teachers some preparation time, but increasing the size of classes; or
• to place all teachers in classrooms, thus reducing class sizes but decreasing the preparation time given to teachers.

Since 1992 the number of students per classroom teacher (and per class) has risen from 23.4 in 1992 to 25.9 in 1998 (Busfield, 1999a). These figures were released by John Brumby (Opposition Leader of the ALP) through the Freedom of Information Act (Busfield, 1999a). In an attempt to keep preparatory class numbers low, classes throughout the rest of the school reflect a much higher number of students:

At least one in three primary schools cram more than 30 children in a class, new documents show. Schools are squeezing up to 37 students into classrooms - 11 more than state average.

(Busfield, 1999a)

In the same article, figures were released to show:

• Classes with 30 or more children exist in 555 primary schools;
• Average class sizes jumped from 23.4 to 25.9 in the past seven years (1992-1998);
• Extra funding for classroom teachers only sliced the state average by 0.1 last year (1998); and
• A Frankston school averaged 31.7 children per class - the state’s highest.

An article, in The Age newspaper (29 January 1999, p12 - Editorial Opinion), commented on the statistics above:

Our teacher-pupil ratio may be average, but it used to be better....However, if they choose smaller classes, very often something else has to be sacrificed. As we have argued before, the cuts which took 8000 teachers out of the system, went too deep in the first place. The government must do more to ease the pressure on our schools.
An independent report, *The State of our State Schools*, initiated by the Anglican Church stated:

...since the Kennett Government took office in 1992, school class sizes had increased, large number of specialist teaching and support staff had been retrenched and schools were forced into collecting voluntary contributions.

(Jones, 1998c)

The Education Minister, Phil Gude, refuted the report in a government document to be presented to the synod. The government report stated that ‘much of the evidence used to support a number of the church report’s findings and conclusions is incorrect’ (Jones, 1998c).

By July 1999, average class sizes had been reduced by an average of 0.5 of a student to 25.4 (Jones, 1999b). However, the figures released by the Education Department indicated that at least 36% (457 out of 1279) of all schools have classes of more than 30 students and 48% have classes which average more than the state average. Figures also showed that some schools still had very large class sizes with classes ranging from 34 to 38 children per class (Jones, 1999b).

In response to the figures released, Phil Gude commented that ‘The reality is the quality of education in Victoria has never been better.’ He went on to state that ‘teachers were the key to quality education. And that schools with large classes usually had more than one teacher with the grade.’ (Busfield, 1999b).

Within the same article, the Education Department stated that:

> Principals and school councils decide class sizes, usually in consultation with teachers and parents.

This assertion can be challenged. Class size is determined by the number of teachers available to the school which is directly related to the amount of funding a school receives. Certainly, more teachers could be employed, but at a cost to other school requirements. Reducing the program budgets for each of the curriculum areas, reducing the cost of maintenance around the schools, reducing the purchase of resources such as
books - all of these measures may release enough money to employ further staff. What an invidious situation the principal and school council are placed in.

In a letter to *The Age*, 18 January 1999, one teacher reacted to Phil Gude's comments about the improved quality of education in Victorian schools. She stated:

> As a teacher in a primary school where there are a maximum of 20 children in a prep class and 26 in a senior class, I beg to differ. The trade-off for all these fabulously 'small' classes is, of course, an arts program that is no more than a token gesture.

> The children are entitled to one term a year of art and music, where they get a half-hour lesson a week for that term. Of course, if the art or music teachers are absent due to illness, they are not replaced, and the children miss out altogether.

> The reality of education in Victoria, Mr Gude, is that when money is taken away from education, principals have to make decisions about how to spend what little they have. The end result is a curriculum jam-packed with maths and English, with a little physical education, science and general studies thrown in. And not much else.

> Is this really the kind of narrow, limited education we want to offer our children?

This was one school's reality. Listening to teachers from around the state, I have come to believe that this reality is the 'rule' not the exception. At our school in the years 1993-1994, we were able to manage with classrooms of about 27 students, even preps had 25. This was accomplished by changing the deputy principal's job into a full time classroom position and by the principal offering classroom assistance to provide some of the teachers' preparation time. In 1995, with a change in principal, and further staff cuts, we were faced with one hour's preparation time, the loss of specialist staff, and still with classes around 27-29 students. In 1996, with the reintroduction of complete preparation time of two and a half hours for teachers, our class numbers skyrocketed to average 33 in the upper three classes and 27 in the lower three classes. My class had 34 students. In that number of 34 individuals, I had one student who displayed severe behaviour problems and was supported two hours each day with an Integration Aide (what about the other four hours?). I also had a child whose mother was dying of cancer (and subsequently passed away through the year), I had another student whose father was dying of AIDS, and yet another student who had to appear in court because of sexual assault charges involving his grandfather and him. Previously, according to
award recommendations, classes which involved integration children would be reduced in number to about 23 students. My class and several others with integrated children were carrying many more students than suggested.

When you have such a big class, it does reduce the time you can spend with each student. It reduces the flexibility of your teaching practice because more time is spent in class management. It reduces the amount of physical space and therefore things like classroom plays or impromptu acting. There is no floor space for educational games, for reading groups, for activity centres - in fact no room for anything but children. The associated noise level increases too. Teachers either have to accept the higher volume of background noise or introduce further management strategies for keeping students quieter. Some children have great difficulty concentrating if the noise level is too high.

In the Herald Sun (19 May 1998) a retiring principal, Bob Wadley, commented on the increased demands placed on teachers and schools. He added, 'I think every primary school could do with an extra teacher' (Wadley, 1998, p35).

Parents are also worried about the number of children in classes. One parent wrote into the Herald Sun (10 February 1998, p20) with this comment:

We need more teachers. Victoria can afford them. Our children deserve better than being crowded into classes of 30 plus.

In the lead up to the Victorian State elections in September 1999, the Liberal-Coalition party has promised to create an addition 600 teaching jobs, mainly in the area of student welfare. The opposition party (ALP) leader Steve Bracks has also pledged an extra 650 teachers to reduce class sizes plus an additional 61 million dollars for programs to support disadvantaged students, the disabilities and impairments program and shared specialist for rural schools (Shaw, 1999).
7.2.2 Lack of Preparation Time

When I came into teaching over ten years ago, the prescribed amount of preparation time was two and a half hours per week. This was indicated by the award which stipulated a set number of hours of face-to-face teaching. Teachers in their first year of teaching were given an extra two and a half hours per week of preparation time and specialist teachers taking heavily practical subjects were also given more preparation time. Although this wasn't specified by an award, it was generally understood that there were greater demands on preparation time if a teacher needed to prepare different material for different classes across the day.

Traditionally, preparation time has been used for just that - time to prepare materials and lessons for students. The allocated time never really sufficed for many teachers who tried to make lessons creative and interesting for their students. A variety of approaches, using a range of stimulating material has always been the best way to gain and keep a student's interest. Teachers of younger children in particular, need to prepare much more of their material, due to the limited capabilities of their students. For this reason, teachers often used before school, recess, lunchtime and after school hours to supplement their preparation time.

Much of this time is now taken up with other duties. As stated in *Assessing the Impact* (Thomas, 1998, p85), teachers now face an increased workload due to:

- increased tasks and responsibilities;
- increased accountability;
- implementation of DoE initiatives;
- increased financial responsibility; and
- increased demands from parents and community groups.

All of these issues impact on the availability of time for classroom preparation. So much time is now used up on all of these other requirements. The DoE recognises that the increases in workload result in:
Increased time spent working outside of the school day which is impacting on non-school commitments, especially family life. Loss of availability to students, staff and parents.  
(Thomas, 1998, p85)

One teacher commented on the imposition of other duties on her life outside the classroom:

_Q - So you've given priority to what you do in the classroom?_  
Oh yes. If you're on a committee, then that's after school, that's extra.

_Q - And when do you do your planning?_  
When do I do my planning? At home... Saturday night, Monday night, Tuesday night, Wednesday night...ha, ha...

(Extract from an interview with JR, 3 September 1998)

Teachers are aware that their preparation time is not stretching to adequately cover the preparation they need to do. One teacher commented:

...how difficult it is at the primary level to do justice to the eight key learning areas. There's just so much preparation, you just can't do it.  
(JM, Interview 15 April 1999)

Further along in the interview, after discussions on laboratory assistants in the secondary science area, the teacher volunteered:

We have nothing like that, we have two and a half hours preparation time a week if we are lucky. On top of that we have other curriculum areas that we are responsible for where most of that preparation time is taken up.

...we have so many responsibilities, as I had last year, with no extra time...

(Interview with JM, 15 April 1999)

At the time, this teacher was carrying an additional responsibility position without any additional time release or monetary compensation for the organisational tasks required.
In *The Age*, a principal made the following comment:

> Teachers do more to assist students because they believe them to be short-changed by the system. This increase in voluntary time has come at a substantial human cost.

*The Age, 21 July 1999, p4*

### 7.2.3 Accountability Demands

Under the Broad Policy Framework, accountability is one of the four areas mentioned as being a school responsibility (see Chapter 2.2.6). Within the accountability framework are three separate elements: the school charter, the annual report to the DoE and the Triennial Report. Teachers are involved in all aspects of the accountability framework to a very high degree.

Writing the school charter itself had an impact on teacher’s workload, as it required many hours of meetings and consultation before the school charter document was ready. Added to this is the ongoing collection of support data to indicate that the goals and priorities of the school charter are being followed and indeed achieved. Further workload increases occur due to the fact that the charter is a ‘living’ document - it is used in all matters relating to school policy, programs, student welfare, etc. Basically, although it created a lot of paper warfare, most teachers were in agreement with the idea of documenting the schools goals and priorities. Therefore, most teachers were prepared to use the document in context.

The introduction of school annual reports occurred in 1996 (Thomas, 1998). At the time, teaching staff were suspicious of the DoE motives and thought that the results would be used to compare schools publicly. There are many aspects of the annual report, with surveys of parents, teachers and students being compiled and sent to the DoE. Student achievement and progress towards the school goals and priorities are another two areas reported on. There is a requirement to report on ‘unique aspects of the school charter not covered by the guidelines’ (Thomas, 1998, p52). It is still unclear just what these results are used for at the DoE bureaucracy. At an inservice on Assessment and Reporting (Melbourne, September 1997), I asked several questions of
the DoE representative. The first of these questions was: Why is the DoE collecting these results? The response given was that schools could use the information to better apply their funds to areas of concern. The question was not really answered - although the DoE representative did continue to say that the results would not be used in a league table to compare schools. The second question I addressed to him was: If a particular weakness was noticed at a school, would extra funds be made available to the school so that they could address the problem? The answer was that additional funds would not be made available, schools had to work within their global budgets and should address any problems from within their existing funds.

School annual reports also add extra work to teachers' large workloads. Although student assessment is part of any normal program, the requirement to assess and report in terms of the CSF levels has increased the amount of time teachers spend on assessment. In addition, teachers have to physically write it out once for student reports and again for annual reports. Kidmap has been suggested as an alternative, but earlier design faults on the Kidmap program meant that:

- the material was not directly transferable from one computer to the next and had to be re-entered manually; and
- reports generated using Kidmap were not able to be used for reporting to parents due to the technical nature of the language in the reports.

The Triennial Report is the third element of the accountability framework. This report is a cumulative report on the status of the school in its attempt to follow the goals and priorities of the School Charter. Again, many teacher hours are required in the process of assessing how the school has progressed. Each aspect of the school charter has to be commented on and supported with documentary evidence. Future directions for the school have to be identified within the context of evidence. This has to be compiled into a booklet which then has to be ratified by an independent reviewer, before being handed over to the DoE for final approval. As well as the teacher time needed, several thousand dollars of school budget is required to provide for support such as typing and presentation of the document.
There are other aspects of school accountability which are not delineated by the accountability framework. These include being more responsive to parents, more responsive to the individual student (as in Individual Improvement Plans) and taking up an equitable load within the school. Quite apart from parent reports, there is an expectation by parents that they will be consulted with respect to any variance to their child’s program or progress. Parents expect to have access to the teaching staff whenever they wish. While this improved communication can only benefit the child, it does present an increased workload on teachers who have to cope with additional impromptu parent interviews. In terms of the child’s achievements, children with special needs have to assisted by the introduction of personal programs to maximize their learning opportunities. These Individual Improvement Plans are drawn up in consultation with the parents and the student. It becomes a contract between the three groups in an attempt to improve some aspect of the student’s learning. It is reviewed regularly, depending on the circumstances, with ongoing meetings between the three participants. Students are required to put in extra effort by doing more work, parents are required to put in extra effort by supervising the student at home and teachers are required to put in extra effort by preparing the work, checking it on completion and monitoring the individual student’s progress.

Also, as part of the accountability process was the introduction of the Learning Assessment Project in grades 3 and 5. This series of state wide tests, conducted annually, present an incredible increase in workload for those teachers involved. They take up to two weeks to complete, therefore disrupting the normal classroom routine. Teachers do not see the value of the LAPs tests, except as another measure to add to their own records. Despite the continued resistance to the LAP tests by the school community, further standardised testing has been introduced in 1999. This is part of the federal government’s requirement to be able to assess all children on a nationwide basis. The national literacy and mathematics tests were incorporated into the LAPs tests. These will be used so that teachers can report to parents on how their child compares to the national average.
Accountability within the school may not be specified by policy but refers to taking an equitable load of the myriad of other tasks which need to be completed. Each staff member is accountable to others so that one person is not under allotted at the expense of another. Extra duties include being a KLA program coordinator, ensuring that the program is running smoothly, ensuring that the program budget is being adhered to and being responsible for the physical purchase of items from the budget under your control. Other forms of responsibility include:

- the review and rewriting of policies;
- being in charge of student or staff welfare;
- Religious Education liaison;
- the role of Integration Officer;
- organising Professional Development;
- Parent Participation liaison;
- organising Junior and Senior materials;
- assessment and reporting coordination;
- school promotions organiser;
- Interventions Programs coordinator;
- student teacher training coordinator;
- kinder and secondary transition coordinators; and
- many other organisational and coordination tasks

In the DoE document *Assessing the Impact* (Thomas, 1998, p83), principals identified the following points as having contributed to the increase in accountability of teachers and therefore, on their workload:

- introduction of the Professional Recognition Program;
- introduction of teacher annual reviews;
- implementation of the CSF; and
- introduction of the school charter.

The Professional Recognition Program is the career structure within the DoE. Apart from Level 1 teachers, there are another two levels of teaching promotional positions, Leading Teacher 2 and Leading Teacher 3. The Level 1 classification is for normal teaching positions, whereas the Leading Teacher classification is for the undertaking of substantive tasks above that of Level 1. In addition to these classifications, schools can award payments of up to $3000 pa for the completion of higher duties. While $3000
may be attainable at other schools, the highest level of payment awarded at our school is $1000 regardless of the tasks undertaken. Leading teachers can become accredited, which means that by completing a 12 month project and undergoing a rigorous testing procedure, they are deemed as being very capable. This allows them access to an increase in salary of about $3000pa. In addition to this, leading teachers have access to a bonus system of up to $3000 each year. A plan of additional responsibilities/projects has to be submitted at the start of the year and is assessed at the end of the year. Teachers are assessed as having achieved 100%, 75%, 60% of their bonus (or failed!). Apart from this, the leading teacher payment scale has no annual increments.

Level 1 teachers have a twelve step incremental scale, apart from teachers who are only three year trained. To progress up the scale, teachers have to submit an appraisal plan which is reviewed midyear and at the end of the year. Annual increments are awarded on the basis of successful completion of the items in the appraisal plan. The appraisal procedure is very heavily prescribed by DoE documentation and depending on the principal who reviews the plan, can be a simple acknowledgement of good teaching or can be a gruelling session of producing documentary evidence to support each aspect of the plan. Teachers who have reached the top of the incremental scale still have to participate in the appraisal system, despite no obvious monetary benefit. There is nowhere further for these teachers to go in the teaching profession. Leading teacher positions are relatively scarce (15-20%) and require a strong commitment to DoE initiatives. Many teachers feel that it is not the path for them, but there is no alternative. There is no recognition for good teaching. Both the leading teacher and level 1 promotional systems carry with them increased workloads trying to justify the value of the individual teacher. This is above the workload already apparent as part of their normal duties. Many teachers believe that the appraisal system is just another form of DoE requirements to ‘jump through hoops’ (Journal entry, 6 August 1998). Teachers have to prove that they are worthy of an annual increment.

The introduction of the CSF has increased teacher’s workload immensely. Not only in the initial familiarization process, but in the application of the CSF to all aspects of planning, teaching and assessment. The sheer bulk of the eight Key Learning Area
(KLA) documents is indicative of literally hours of reading before any level of
familiarity can be achieved. For each KLA there are a number of themes (strands) and
sub-themes (sub-strands) which have to be considered as a teacher organises her term,
weekly and daily planner. Every aspect of teaching has to relate to the student
achievement outcomes specified within the CSF. Teachers are being held accountable
for student learning in a tightly controlled, heavily prescribed curriculum setting. The
specifications of the measures of accountability require teachers to spend many hours in
assessing individual students against the complex array of outcome statements.
One teacher at school commented:

...given that most of us work at least a fifty hour week and more than
that often, it's an impossibility for us to cover those eight areas
thoroughly.

(Interview JM, 15 April 1999)

In a newspaper article, principal of Ivanhoe Primary School, Bill Hunt commented on
the school reforms including accountability:

But he fears that the increasing emphasis on accountability,
documentation and the 'bottom line' is taking its toll on schools,
particularly teachers and support staff.

(Hunt, 1999, p4)

On a positive note, one principal commented to The Age (21 July 1999, p4):

The increased accountability measures and the requirement of schools
to develop, implement and review three year charters has made a big
difference. A very positive one.

7.2.4 Professional Development

Today, teachers are under pressure to keep up with the developments
not only in the curriculum, but in health and welfare issues,
administration and technology. Self-education is as much part of the
teacher's day as marking the roll.

(Herald Sun, 24 February 1998, p35)
Professional development (PD) is seen as teachers increasing their knowledge and understanding in an area with a resultant improvement in their teaching skills. With the changes to the education system in the last seven years teachers have been struggling to update their skills to match the changes. One of the first things to alter was that the number of pupil free days was decreased from eight to four a year. Traditionally these extra days were PD days wherein each region would run a range of workshop activities based on the needs of the teachers, canvassed in advance. While PD seminars and activities were still available to teachers, the whole structure of PD underwent a drastic change:

...often means applying routine invented by others, believing reasons invented by others, servicing aspirations invented by others, realising goals invented by others and giving expression to values advocated by others.

(McTaggart, 1994, p320)

Professional development followed the dictates of the DoE initiatives. Learning how to interpret and use the CSF was one of the first areas offered by the DoE as PD. This was done as single one-off experiences, or through the use of CSF Networks which operated each term to discuss and share management strategies related to using the CSF and other documents like the Course Advice. Following this came PD sessions relating to every DoE initiative: Assessment and Reporting using the CSF; Learning Technologies in the classroom (e.g. Navigator schools); Kidmap; writing school charters; school council roles and responsibilities; Professional Recognition Program; Early Years Literacy; Safety in the Water; Consistency and Moderation in Report writing; Physical and Sport Education (PASE); Early Years Numeracy; and Science - SET for Success. For every new change came the requirement to become familiar with it sufficient to implement these changes at the classroom level. Many of these PD activities have been held outside of school hours and unsupported by additional funds to schools for implementation or even time release for staff to attend day sessions. Although stating that there has been a huge increase in PD funding, it is still inadequate to meets the needs of the accelerated changes introduced in schools.
A casualty of this style of PD is that less and less time is available for teachers to follow what they see as areas of need in their own teaching practice. Keeping abreast of educational research is a fantasy for all but those teachers pursuing additional studies. By the time teachers attend to their daily workload, and attempt to become proficient at some of the DoE initiatives, there is no time left to follow other types of PD. This is mirrored at my school where an analysis of professional development undertaken over the three year period (1996-1998 inclusive) revealed some interesting data. Personal professional development dropped from 31% of all PD in 1996 to 6% in 1998. Over the same period, PD relating to DoE initiatives, school goals and priorities and leadership rose from 69% to 94% (Triennial Review, Maxwell PS, 1999). The actual expenditure on PD dropped from 2.56% of the school’s global budget (1996) to 1.85% (1997) to 1.74% (1998).

It is interesting to note the difference in my opinion from that of principals. As stated in *Assessing the Impact* (Thomas, 1998), ‘it remains clear that professional development is a success story in Schools of the Future.’ With the introduction of professional development plans in the last few years, teachers and principals are becoming more specific about what areas of PD they wish to pursue. The PD plans are guided by a number of priorities. Firstly, the school goals and priorities are considered as the most important areas to upgrade skills in. Secondly, DoE initiatives are the next items of importance in terms of teacher PD. Finally, other forms of PD follow on a poor third. Is it any wonder that truly personal PD is being lost in the system? Unfortunately, the DoE label these PD plans as Personal Professional Development and principals believe that teachers are undertaking valuable PD. All that is occurring is that teachers are being given the opportunity to implement DoE initiatives a little more smoothly. The DoE boasts about the amount of money poured into PD, however, the scope of the PD funding is really to ‘push’ the DoE priorities. In the booklet *Celebrating School Education in Victoria, 1999* (a DoE publication) there is a section labelled Teacher professional development (p45). Within this section, the professional development opportunities for teachers include:
• Major conference for the *Early Years*, the Middle Years and Learning Technologies;
• Teacher Digital Networks;
• Women in Leadership programs;
• Principal induction programs;
• Learning Technology programs for school leaders;
• Extended professional development programs in science education; and
• Support for Civics and Citizen and Traffic Safety Education Networks.

A visit to the Education Professional Development web site (http://www.sofweb.vic.edu.au/pd/, 9 September 1999) provides another set of PD offers in curriculum, Learning Technologies, VET & Industry Programs, PD planning, accredited PD, Victorian PD Network and PD catalogues. It is clear from perusing these documents that the DoE has its own agenda with respect to teacher PD, one which doesn’t necessarily align with what all teachers want or need. On a more positive note, PD which is grounded in educational research and substantiated by practice in trial schools is of value to teachers.

There are really two elements to funding for PD. One is the amount given to schools in their global budgets to support teachers to pay for and attend PD inservices. The other is the amount of funding the DoE provides for PD to support its initiatives. Over the last few years, the amount of money available for PD has increased. Early in 1999, the state government promised:

&S78 million dollars for a quality teacher program to help teachers focus on professional development in literacy, numeracy, mathematics, science, information technology and vocational education.

(Nicholson, 1999, p3)

I would suggest that this is targeted mainly to the second area, not the first. Within the school global budget is an allocation of approximately $250-300 per teacher per year to provide PD (*Herald Sun*, 24 February 1998, p35). As most full day sessions cost between $100-200, and the replacement teacher costs about $180, the DoE allocation is barely enough to provide one PD day a year for each teacher. Schools have recognised this need and have released other funds from their global budget to improve teacher PD. However, this is very much reliant on the financial situation of the school and the
opinion of the principal. At a Primary PD Coordinators’ Network meeting in February 1999, the various schools’ PD budgets were discussed. It was obvious that some schools placed a far greater importance on PD than others. In one school, the position of PD Coordinator was linked to a promotional position (LT3) and funds to support staff PD were two to three times larger than at other schools. It is simplistic just to look at PD in terms of money - apparently the school devoting so much effort and money in PD saw that there was a need for some teachers to expand their skills and educational visions (Journal entry, 15 Feb 1999). One principal commented on his rationale for PD:

I look at what fits in with our plans for the school, then consider whether we have the personnel suited to the program and whether we can afford it.

(Herald Sun, 24 February 1998, p35)

The DoE have made their philosophies quite clear. By providing money to support their initiatives and little else, they are indicating that this is where PD should occur. At a Parliamentary Review of Teachers Professional Development Needs (31 May 1999) the Regional Principal Consultant indicated to PD coordinators that schools had to supplement the PD budget because the DoE management did not see that it was their sole responsibility (Journal entry, 31 May 1999).

With so many changes to keep up with and in many cases insufficiently resourced PD, teachers are bowed under with the workload and the thought of further DoE initiatives. At a PD Coordinators Network meeting (15 February 1999), one PD coordinator commented that teachers at her schools were reacting with ‘not another new thing’ (Journal entry, 15 February 1999).

7.3 CHANGED POWER RELATIONS IN THE PROFESSIONAL CONTEXT

An interesting dichotomy can be observed in schools. There has been an advocacy for team building and team relationships from researchers on change and change agents (Johnson, 1997). Neville Johnson, addressing a group of KLA Network Leaders, spoke about classroom change needing to occur at the classroom level and that the only way this could be achieved was to involve all teachers in the change process. This has been
strongly picked up by the DoE and can be seen in many of its PD initiatives on team building and team management.

Unfortunately, the reality is quite different.

Certainly, schools have built up teams - they need to so that the immense amount of work can be divided up and shared. However, many of the teams do not operate as cohesive units in which all contribute to the decision making. The hierarchical system has caused some teachers to resent the sharing of loads while only some teachers gain the rewards. Promotional positions are not common, and bonuses for extra duties are really not commensurate with the work entailed. In some situations, strong resentment is occurring. Leadership skills are extremely important but even some staff who believe that they are exhibiting such skills, in reality work off the old system of ‘do as I say’. Principals and leading teachers are the harbingers of change, but the way they act is often determined by different, hidden agendas. Pressure of time lines, imposed by DoE requirements or individual performance plans (to which a bonus is attached) may influence the way a particular project is implemented.

The Schools of the Future project was meant to divest decision making to the schools. In some respects it has achieved this, but most of that power of decision rests firmly with the principal. Despite trying to create teams and team management, increasingly principals are making the bulk of the important decisions ‘at the ground level’. Teachers have been disinfranchised by SOF which has taken away their power to participate in curriculum design and management. Directions from the DoE in all aspects of schooling are so prescriptive that teachers are becoming mere technicians with little input into educational matters.

In discussion with the Industrial Officer of the Australian Education Union, Brendan Murray, he commented that many teachers were intimidated by the power of the principal. Not that teachers had direct conflict with the principal, but were aware that the principal held the power to decline approval for annual increments, or would not be supportive of bonuses to teachers who did not toe the line. He commented that in many
ways 'principals have a lot more power than they once had' (Murray, B., 1999, personal communication, 8 September). This comment was in relation to staffing, the management of incentive bonuses and other internal decisions.

It has been recognised that with respect to certain elements of school management, particularly related to external decisions, curriculum definition, and assessment and reporting, principals have actually lost some of their power. As one principal stated about the SOF program:

It has increased my workload dramatically and, while giving me greater responsibility, as a principal has actually reduced my control.

(Questionnaire Response, 'Dorothy' 1996)

However, the DoE clearly sets up principals as the authority figures in schools who represent the managers of the system. Principals are meant to promote DoE initiatives and to represent the DoE philosophy rather than their own opinion or that of their staff. An example of this is in the evaluation of SOF program. Over a five year period, it was the principals whose opinions were sought about SOF, not teachers, allied staff, school community members, school councilors or others - just principals.

7.3.1 Changed Relationships Among Schools:

The Three C's - Cooperation, Collaboration and Competitiveness

Fundamental changes have forced schools into a competitive marketplace. Its competition for enrolments, competition for finance and resources and competition for community appreciation and support. As a result, the groundrules for competition between schools have been rewritten.

(Vining, 1996, p6)

One of the direct impacts of SOF is in the marketisation of education. The amount of money a school receives in its global budget is directly related to the number of students it has. Schools have become 'competitive franchises' (Bates, 1994) in their attempt to attract and retain students. Simon Marginson (1994) comments on the relationship which has developed between schools:
State schools have been placed directly in competition with each other. Instead of all schools being encouraged to do well, the success of one school is now the failure of another. Schools are competing directly for private funding and also for government support, especially if funding is proportional to enrolments.

Jill Blackmore (1994) also comments on the issue of equity and funding for schools:

Advocates of self-managing schools have made a naive and misplaced assumption that all governments will make equity a priority in their allocation of funds and that all communities will do likewise in deciding upon their use.

Two distinct, but related, points are made here. One is that competition between schools is directly related to funding levels and that funding will affect equity within schools. Jill Blackmore indicates that private funding will also be subjected to community preferences.

In the Geelong area, some schools are better placed than others when it comes to seeking support from the business community. While some schools have penetrated the business market, most are still working at the local community level trying to encourage small businesses to support them to some degree. So much depends on the businesses in the locality and the makeup of the school parent group. Schools really tend to rely on individual fundraising, voluntary levies and government funding. Heavy competition occurs at the 'bums on seats' level.

As a consequence of Schools of the Future policies, schools have become implicated in a complex web in which their performance feeds from and into media representation, public perceptions and community understandings of their work.

(Blackmore, 1995)

Schools produce glossy promotional brochures, school councils operate a ‘promotions’ subcommittee and principals spend up to an hour with prospective parents enlarging on the benefits of their school. The local newspaper is contacted about any major school event in the hope that the school will receive favourable publicity relating to its programs. It has been observed that some schools in the Geelong area appear to have
better contacts with the local paper than others, reflecting in the amount of positive ‘press release’ these schools gain.

Observations of other countries which have introduced ‘competitive educational markets’ indicate that the outcome is ‘increased educational inequalities’ (Bates, 1995). In New Zealand, the reality of the situation according to Codd (1993) is that ‘schools are pitted against one another for resources and students.’ In a comprehensive survey of schools in New Zealand, Cathy Wylie (1997) found that:

Schools in competitive situations were mainly urban, and twice as likely to be at either end of the socioeconomic spectrum as those serving middle income areas.

Competition for students and funding was intended to spur schools on to make themselves attractive to parents and students. Apparently in New Zealand, this is not happening, at least not to any large extent. Only 21% of schools felt that they were in competition with other schools and only 22% had made changes to their school promotion (Wylie, 1997). Cathy Wylie (1997) continues by drawing on the evidence which suggests that competition, rather than affecting schools in a positive way, has a negative effect, particularly in terms of disadvantaged schools serving low income communities.

Back in 1992, our school existed in a network of other schools in the district. We shared resources, such as sports equipment, Lego technic, small typewriter computers. We organised athletics, swimming and sports together in a community feeling of commitment to equal educational opportunities for all students. We still do some of these things together, but much of the collegiate support has disappeared. The network no longer meets to share equipment and resources. Staff are too busy to attend yet another after school meeting and provision for day time meetings is not given. There is nobody willing to organise, collect and distribute common equipment. Some schools within the network have merged, others have grown, some have lost students and have been closed down. In the climate of rationalisation in 1993 and 1994, schools feared for their very existence. The networks that schools had built up actually worked against
them as this ‘local knowledge’ was used in informing decisions of closure and merger.
A principal commented on the effect of this ‘rationalisation’ on the relationships
between schools saying that it caused ‘...greater competition between schools - less
cooperation.’(Questionnaire response, Dorothy, 20 November 1996)

Several years ago, as schools felt the ‘pinch’ of limited resources, some schools resorted
to a change of tactics. There had always existed within our network an understanding
that new school enrolments would take place in third term. All schools worked towards
this date, promoting their schools and setting up to enrol their share of new students.
Suddenly, one school advertised for enrolments shortly after second term commenced.
A publicity campaign was launched by this school which left other schools caught
wanting. Several other schools quickly followed suit and it seemed like all out war had
been declared. Staff felt uncomfortable with this turn of events. Teachers at other
schools who had been colleagues were now seen as poachers and inter-school
relationships hit a low point. It took close to a year of discussions at school council and
principal level to return the schools to friendly relationships and a new understanding of
the problems of competitive marketing.

Although schools appear to have stabilised their inter-school relationships, there is an
ever-present knowledge amongst teachers that a loss of students to a neighbouring
school could mean a loss of teaching staff. This would not affect the principal or
leading teachers who are secure in their employment but could affect ordinary
classroom teachers.

7.3.2 Central Bureaucracy: Principals: Schools

Schools of the Future devolves managerial responsibilities and some
of the responsibilities for funding and staffing to the local school
level but control over educational policy is more firmly recentred
under government control.

(Marginson, 1994)

Although principals have greater power over many aspects of the school agenda, in
reality they have ‘become both the mediators in these new set of contractual
relationships (school to school and school to parent) and also the buffer for the state against teacher resistance' (Blackmore, 1995, p2). Problems in education are now being passed down the line to schools and principals who are being 'held responsible for the hard decisions about competing educational priorities' (Blackmore, 1995, p2).

Blackmore went on to comment that good leadership was where 'principals manage to quieten dissent and debate.' Under the SOF, there are strong measures of accountability and the internalisation of these external goals requires a strong leader who is 'a culture builder and initiator of change' (Blackmore, 1995, p7). Townsend (1994, p154) also believes that:

The principal, to a large extent, is able to facilitate (or control) the culture of the school, the means and levels of communication within the school and the tone and direction that the school will take.

Principals have to mediate and negotiate pressures for change, change initiated through bureaucratic, centralised control. New hierarchies have been established where principals are distinguished from other teachers in terms of performance pay, decision making and their industrial relations role.

The principal... is positioned ambiguously in a system in which educational decisions are made at the centre and the management decisions at the school.

(Blackmore, 1994, p152)

An indication of the changing role of principals can be seen in the growth of educational studies tailored to the needs of principals in the area of business management and leadership (Whitty, Power & Halpin, 1998, p51). In Australia, courses in educational administration up to PhD level are available (McFarlane, 1996). Text books on educational management have increased as well (Whitty et al, 1998, p51). At a less obvious level, Grace (1993, cited in Whitty et al, p51) comments:

...but more pervasively, the language, assumptions and ideology of management begin to dominate the language, consciousness, action and modes of analysis of those working within the education sector.
Although commenting on experiences in England and New Zealand, Whitty et al (p52) state that these trends have been noticed on other parts of the industrialised world, particularly in countries which adopt the key features of self-managing schools.

The changing role of principals is very evident. At our school, we have had three different principals since 1993, and since the inception of SOF, we have had two principals. It is interesting to note the principal’s alignment with officialdom, sometimes at odds with this person’s unofficial philosophies. Principals have, by necessity, been forced to take on more administrative tasks and abandon their teaching allegiance. There is a discernible distancing between principals and teachers due to the imposition of DoE requirements and the principal’s task to pass these down the line. The powerful position of the principal with relation to his or her staff is another factor in the obvious separation of these two groups. The principal is seen less and less as a colleague and more as a manager who no longer fully understands the needs of the classroom teacher. In a conversation with a principal at a large secondary school in the Geelong area, the principal commented that his role was not to liaise with staff or students; that was for his assistant principals to do. His job was solely to manage the school to DoE requirements.

It has been through the efforts of the principals that the SOF project has been implemented in schools. Without their support, the DoE would not have been able to continue with the SOF. This rather unique position of the principals was highlighted in 1997 when principals threatened to take industrial action over a log of claims which had been delayed by the DoE. The Victorian Principals Federation were successful in bringing about a compromise by the DoE through threatened strike action (Coslovich, 1997). All negotiations with teachers over similar matters ended up in the AIRC. Although not a militant group, the principals have been vocal in their objections to aspects of the SOF project:

Of the negative impacts, the most often mentioned was ‘lack of support by the Department of Education. ...principals were also concerned about the rate of change, remuneration levels, and decreased school level control of the curriculum.
Principals noted difficulty in balancing the educational leadership role with that of manager.

(Thomas, 1998, p86)

7.3.3 Changes in the Culture of Schools

The culture of schools has shifted because of the changes to management structure and policy. As stated in Gerwitz, Ball & Bowe (1995, p109) by a principal of an English school:

A whole new vocabulary has entered into schools, particularly the management of schools... We’re having to relate the management decisions that we make to the use of the resources available in the school... We have to take account of whether they are used in the most effective, cost effective, and other aspects of effective, ways. So we talk about cost effectiveness, about accountability, we talk about quality control of various types of expenditure, we talk about budgetary control... So the culture is changing, the language is changing and we are using the language of the market place more and more. You hear people talking about ‘cornering the market in this particular aspect of school work’ or ‘Where is our market?’ ‘Who are our customers?’ ‘Who are our clients?’

While Australia in general, and Victoria in particular, is not as far down the self-managing path as English schools, it has been my observation that this change in culture and language is already occurring in local schools (some more than others).

The marketisation of schools has become important in that school funding is based on the student enrolment numbers. According to Gewirtz, Ball and Bowe (1995, p89):

The disciplines of the market are very real, the pressures on headteachers to ensure the survival of their schools are very real and the dilemmas they face are very real.

One school principal commented in The Age (20 July 1999, p4):

Sometimes I feel like the manager of Kentucky Fried Chicken - how many buns did I sell this week?
The school image is very important in gaining student enrolments and schools have followed the pathway of promoting very positive images. Schools must promote themselves. They have to 'sell' their good features. However, it goes much further than this. According to Vining (1996, p6):

Quality alone does not sell a school. In a competitive environment a quality product is just a starting point. You need marketing skills to gain a competitive edge.

A school needs to develop those skills which place it into the consciousness of possible 'customers':

The market-oriented school...harnesses the power of positive publicity and manages word-of-mouth. It develops the tools and expertise necessary to promote itself to its community and it understands the factors that influence school choice.

(Vining, 1996, p9)

The main focus of this promotional thrust is the parent group, although students and the broader community have to be considered as potential targets as well. Apart from the immediate tangible benefits of student achievement, 'parents look beyond the classroom for broader benefits, such as values, behaviour, self esteem, networks and future directions for their child.' (Vining, 1996, p10). A principal in the area commented that 'large amounts of time and money are spent on school promotion' (Questionnaire Response, Dorothy, 11 November 1996).

The culture of change, the market mentality, is being resisted by most teaching staff. Principals, Leading Teachers and School councillors who are pressed by the necessities to manage the school's resources are more open to suggestions of marketisation. Most teachers, while wanting well-funded programs, believe that this is a government responsibility and not that of schools. Most believe that 'selling' the benefits of the school or attempting to raise substantial funding for the school is outside their philosophical agreement about what constitutes education. This resistance manifests itself in several ways. Firstly there is the outright resistance. Teachers make their views known and actively resist any participation in what they see as overt marketisation.
The more general form of resistance is passive. Teachers grumble about being involved in marketisation activities but participate for the benefit of the school. Cooperation is coerced. This is not meant to negate the fact that teachers are proud of their schools and will actively promote them given the opportunity. However, the reasons for this are altruistic and not related to money - they believe in the good work that is occurring in their school and like to make this visible. Due to the fact that most teachers have been in education for many years, their beliefs stem from the premise of education as being ‘free, secular and available to all’.

In The Age, Bill Hunt (1999, p40) states that:

The reality is that state schools have to think more about marketing. Sometimes the very existence of a school depends on what you do well. Some schools may not be able to market themselves as well and it’s a fact that disadvantaged schools find it harder.

So, marketisation is still occurring. Funding levels have to be achieved for the school to operate to its full potential. It is important to keep this fact in mind as we view the overwhelming evidence of this happening in schools. To keep a school viable by attracting further funding, and with DoE approval and support, many schools are forging links with local businesses or community agencies. This has been coined the McDonaldization of schools (Whitty, Power & Haplin, 1998, p92):

Whereas the school curriculum has traditionally transcended - indeed actively distanced itself from - the world of commerce, the growth of self-managing schools and the promotion of market forces within education are forging a new intimacy between these two domains. Commercial penetration of the curriculum is evident in all our countries.

(Whitty, Power & Haplin, 1998, p91)

The first instance of this on a large scale was the Coles ‘Apples for the Students’ project wherein parents, teachers, students and other community members collected Coles sales dockets for up to six months to be eligible to gain free computers (Kenway, Collier, Tregenza, Bigum & Fitzclarence, 1994, p23). Most schools took part as it was the only way they could resource their schools with computers. Since then there have been a
number of other commercial enterprise programs which offered benefits to schools for the free promotion and publicity within this ‘captured’ community. For example: Pizza Hut ‘SportIt’ program which supplied free ‘healthy’ pizzas to students who achieved certain sporting skills in their program. There was the ‘Rev’ milk challenge which provided schools with sports equipment in exchange for the collection of tokens from the side of Rev cartoons.

Kenway et al (1994, p24) comments on the benefits to companies which undertake sponsorship or support of schools:

- Gaining access to schools and hence students;
- Building in ‘brand loyalty’ at an early age; and
- Often cheaper than other forms of promotion while dealing more directly with the consumer.

In NSW, until 1995, McDonald’s was involved in schools. It had been involved in sponsoring schools to the amount of $296,000 per year. Other companies, such as Coca-Cola, also gave large donations of up to $100,000. A foundation had been set up to handle these donations and imposed strict guidelines for sponsorship of school events. The foundation attracted over $1.7 million dollars in three years (The Age, 21 October 1997, p11).

As mentioned earlier, there is some resistance to marketisation from within. However, to illustrate the point, I would like to draw three hypothetical pictures - call them ‘before marketisation’, ‘in transition - present times’ and ‘after marketisation’.

‘Before marketisation’
At a typical recess, teachers are talking about a range of topics, some personal, but many related to school. Teachers might talk about the behaviour of a difficult child and could be asking for suggestions from other staff on management strategies. Another teacher might be suggesting a lesson that worked really well for other teachers to copy or adjust for their own teaching. Yet others might be discussing the organisation of a school excursion. Later that day, after school, they all meet again for the weekly staff meeting. Issues to be discussed might include the annual review of two or three school policies and the delegation of responsibilities. Other matters might be related to the school’s policy on management of ‘difficult’ children as a direct
flow on from the teacher's concerns earlier in the day. A teacher may relate back about a professional development activity she attended and share the ideas with all staff. Other matters relating to the teaching and learning needs of the schools might be raised.

'In transition - present times'
Hurriedly, before school, the Prep teacher is photocopying some material to hand out at the local kindergartens. She is being relieved of classroom duties to attend the Pre-school centres to speak with parents about the positive things happening at this particular primary school. Later, at recess, there is a smaller enclave of teachers present (staff cutbacks achieved by altering teacher/pupil ratios has caused some of the problems). However, this year there is now double the number of teachers on duty. This is not related to playground violence, rather other bigger schools have done it and this school would appear remiss if it didn't follow suit. It might be accused of not showing enough concern for students' welfare. Teachers now face two hours of yard duty a week. The staff in the staff room are discussing the school's upcoming open day, at which time 'new' parents are invited to come to the school to view classes in action. Apart from an introductory greeting from the principal, and an escorted tour of the school, using school council parents, these potential clients will be given morning tea while their children are catered for in the prep classrooms. No extra teacher help has been organised (not enough money). Children from grade six will be involved in assisting the prep teachers with controlling the younger children. Later in the day, at the staff meeting, issues that are discussed are the school's reporting document, and how teachers can use various aspects of the computer program in completing their reports. Unit groups arrange another meeting for later in the week to discuss consistency and moderation in their assessments. Teachers are asked to record all their results on the annual reporting sheets which will be entered into Kidmap and the CASES file for inclusion in the school's annual report. The meeting concludes without any relevant discussions on teaching or learning concerns.

'After marketisation'
The business manager arrives at 6 am, with the first round of teaching staff coming shortly after. The first shift of students is due to arrive in an hour. The deputy principal comes at this time also to handle any parent or teacher concerns. Over morning recess, the business manager outlines the new school business arrangement with a local pharmaceutical industry. In exchange for providing science equipment to the school, the school would act as an outlet for the promotion and sale of pharmaceutical products - a direct link for the company with its buyers. The company would provide a staff member for a 'scientist in schools' program which could be also subleased out to other schools needing this facility. Teachers would be required to actively promote the company's products at all times. As well, they would handle the initial contact with any orders, processing these against student names and recording amounts. This information could then be used by the company to target specific
parents directly for further products. The business manager reminds staff that marketisation was now a clause in their employment contracts. Later in the day, the second round of staff comes early to attend a staff meeting before commencing duty at 1 pm. They are joined by staff finishing their shift at 12:15 pm. Discussions under review include the after school-hours child support program and how teachers could assist. Teachers involved in the on-line teaching of off-campus students are asked to give a progress report on this new initiative. The business manager explains that the school’s Web page had been upgraded to include the new initiative. Further communication is referred to the internal network communication via email. The meeting ends promptly as the second round of students responds to the invitation to come to class.

These are hypothetical situations, but the first two are based on experience and are valid and authentic possibilities. The last situation is difficult as I really don’t have any experience dealing with the business world in education but it does appear a reasonable extrapolation based on the recent rate and nature of change. Perhaps this will be the extent of marketisation, perhaps it could be even more far-reaching than this. In other countries around the world, schools have actually been ‘sold’ to private companies to manage as educational businesses. This has proved unsuccessful, as the businesses reduced the curriculum to only core subjects to save money (Blackmore, J., personal communication, 18 October 1999). This has been considered by senior government staff in the Victorian DoE. Documents obtained under the Freedom of Information Act revealed that senior officials in the DoE had commissioned a report on the changes to the structure of the state school system (The Age, 7 September 1999, p1 & 6). Some issues mentioned were the possibility of the private sector building, owning and operating government schools, and the proposal for existing schools to be contracted out to the private sector.

Accountability is one part of the SOF framework so it envelops all aspects of schooling. School performance, student outcomes, annual reports, triennial reviews, school charter, parent/teacher surveys are all aspects of accountability. How accountability affects the power relationships in a school is not simple. The roles of the principal and the leading teachers in affecting the implementation of the SOF are crucial. Other staff who assist, or who don’t resist, can be considered ‘friends’ of the established order. Those who resist or even just question the implementation of SOF practices find themselves at best
ignored, at worst, victims of the new regime. Promotions or bonuses are not really available to good teachers, they are available to staff who will help implement DoE initiatives (or change). Should the circumstances arise for promotion within the school, who will be rewarded, the person who has assisted in the past or the person who has resisted (all other aspects equal)?

Teachers are very aware that SOF has disempowered them. The tightly specified CSF, constant top-down demands, erosion of work conditions, career opportunities, all indicate a systemic attitude of disregard for the professionalism of teachers.

7.4 CHANGES IN CURRICULUM AND TEACHING ROLE IN THE PROFESSIONAL CONTEXT

7.4.1 Changes in Curriculum

Throughout the world, as part of the introduction of self-managing style schools, most governments have introduced a centralised curriculum, similar to the Curriculum and Standards Frameworks (CSF) introduced in Victoria. Whitty, Power and Halpin (1998, p79) indicate that this has the following benefits for the government:

...the imposition of national and state-level curricula and assessment programmes can enhance the ability of the state to steer at a distance, as well as supposedly providing consumers with the comparable data to distinguish between schools.

The effect of a centralised curriculum on schools and particularly on teachers has been explained:

The content of what they teach and how they assess is regulated by the government, and their performance is evaluated and rewarded or penalized through parents’ choices.

(Whitty, Power and Halpin, 1998, p79)

The inclusion of student outcomes or achievement levels is new. Previously, curriculum documentation was in the format of guidelines for teachers. Broadfoot (1996, cited in Whitty, Power and Halpin, 1998, p87) states that what is occurring is:
...a greater homogeneity or rationalization of curriculum provision within a detailed framework of sequential targets rather than the provision of curriculum guidelines in terms simply of courses of study or subjects to be covered.

She precedes these comments by stating that assessment is used to determine competence. Key competencies have been built into the Australian National Curriculum and also into the Victorian CSF. Many other countries which have introduced these new curriculums have also published league tables of school competencies based on student achievement. Whitty, Power and Halpin (1998, p87) argue that ‘the publication of performance indicators represents an important dimension of market accountability and the consolidation of central control’. Internationally, there has been a re-emergence of the ‘back to the basics’ thoughts and core subjects such as mathematics and English are given more emphasis. As stated by Whitty, Power and Halpin, (1998, p89) ‘The gradual trend... reflects a more general shift towards traditional education’ and ‘There is little doubt that the past few years have seen increasing emphasis on old-fashioned education.’ It has been stated that teachers are altering the way they teach. Hughes (in Whitty, Power and Halpin, 1998, p89) mentions that ‘teachers spend less time on topic work and are abandoning the integrated day’.

In New Zealand, where a National Curriculum was introduced in 1993, Wylie (1997, p144) has found that some teachers indicated the following impacts: increased workload (36%), work was easier to plan (24%), teaching style had changed (16%), more time spent on planning (13%). These do not reflect the true situation, as these were responses to the open ended question of the perceived impact of the national curriculum. For example, because 36% of teachers said there was an increase in workload does not mean that 64% said there was not an increase in workload. Increase in the amount and type of assessment was another area identified by Wylie (1997, p144) as a major change of introducing the national curriculum. Wylie went on to ask:

...whether the benefits of increased assessment are being undermined by the time it takes away from work which is just as important as assessment and its analysis in meeting children’s learning needs?
In Victoria, Blackmore et al. (cited in Whitty, Power and Halpin, 1998, p89) reports that similar changes were occurring in Victoria. She states:

...teachers in their case study felt under pressure to move away from their preferred way of teaching, which tended to be more open-ended, explorative and integrative, to more structured task and outcome orientations.

Bates (1995, p6) comments that in Australia, the National Curriculum Statements and the CSF are instruments of a wider agenda, that of making ‘education the instrument of economic recovery’. He also comments on the ‘vocationalisation’ of education wherein industry, unions and Government see education as the tool leading to employment. Within the same working paper, Bates (1995, p8) relates ideas from a newspaper article (Bishop, 1994), which have since gained validity from experience overseas and in Victoria. Summarised, these are as follows:

- CSF too detailed and wordy - difficult for teachers to use;
- Levels and strands are artificial divisions;
- Strands make little sense as a curriculum structure; and
- Integrated or thematic work will be difficult to sustain due to the detailed reporting and testing required in each KLA.

The Curriculum and Standards Frameworks have been introduced into Victorian schools in the last five years. Although there was a reduction in the number of key learning areas, eight compared with nine in the previous system, the complexity of the new frameworks immediately heralded a range of changes for teachers. The most obvious was an increase in workload for teachers which was discussed earlier in this chapter. Less obvious, but equally important, were changes in the way teachers had to approach the curriculum. There was a new structure (strands and sub strands) to the frameworks and a lot of new content knowledge to assimilate. In addition, the level of accountability was extreme by comparison with former systems. The curriculum in primary schools has been ‘crowded’ since the introduction of the specified curriculum in 1988, but with no imposed standards, schools were able to integrate the curriculum. With accountability standards, schools struggle to continue with an integrated curriculum which still delivers enough specificity in terms of student outcomes to
satisfy DoE requirements. Directives from the DoE which specify the minimum number of hours to be taught in some subject areas has added to the problem. In a twenty-five hour teaching week, ten hours is taken up with literacy, five taken up with maths, physical education requires another three and LOTE ranges from one to three hours (grades P-6). That is a minimum mandated nineteen hours taken up in those curriculum areas (21 for grade 6), leaving only six hours to cover all the other school requirements and the remaining four key learning areas. If you take into account school excursions, school assemblies, learning technologies, library, swimming programs, sports events, special theme days, it starts to become clear why teachers are complaining of crowded curriculums. In *Assessing the Impact* (Thomas, 1998, p82) the crowded curriculum was identified by principals as having a negative effect on students:

Negative impacts included too many subjects in the curriculum (crowded curriculum), increased assessment and accountability, priority given to academic learning areas in preference to non-academic, and decreased response to local community needs.

It did not specify exactly what these effects were, but implied that a crowded curriculum meant that there were too many subjects.

In *The Age* (20 July 1999, p4) an extract from the survey of principals of Victorian state schools stated:

Society’s expectation of what needs to be dealt with in schools (such as drugs, suicide, information technology, sexuality and parenting) have crowded the curriculum to the stage where teachers feel they can’t cope.

Mario Pinti (1999, p31) writes that the word curriculum means so much more than just the teaching of core academic subjects:

From sex education to ethics, from conflict resolution to making lifestyle choices, from driver education to being sun-smart, schools are expected to have a policy, a considered response to each social issue. Every time a crisis is considered to have occurred, teachers are expected to address it.

(Pinto, 1999, p31)
In the *Herald Sun*, Phil Quinlan (1999, p17) advocated that schools should 'fulfil their primary function of providing a sound basic education'.

As well as the increased complexity and accountability of the CSF, some teachers are advocating that in some areas of the curriculum, specialist knowledge is required. KLA's like physical education, LOTE and science have very special knowledge which is difficult for a generalist primary teacher to acquire in ordinary training. When many of the teachers in the system undertook training, LOTE and science were not included in their methods training. As one teacher commented:

> It’s an impossibility for us to cover those eight areas thoroughly and I believe there’s a need for specialists at the primary level. I think it’s impossible to do all those areas justice as one teacher.

*(Interview JM, 15 April 1999)*

Further comments from this teacher indicated that many specialist areas are heavily practical subjects which adds to the difficulty for taking them as a generalist teacher. She said:

> You can’t theorise with children of that level, it has to be practice. Therefore, the preparation is much more involved and it takes time to get things ready... it is unrealistic of the Ministry to expect us to cover, adequately, eight key learning area without the assistance of a specialist. You can only pose some sort of token respect to that area.

*(Interview JM, 15 April 1999)*

### 7.4.2 Changes in Teachers’ Role

The move to self-management was meant to empower teachers so that teacher could make decisions more directly related to their school community (Caldwell & Spinks, 1988, p80). This has not occurred. In fact, teachers have been disempowered by many of the constraints of SOF. Robertson (cited in Whitty, Halpin and Power, 1998, p65) claims:

> ...teachers' work has effectively been proletarianized, both ideologically through loss of control over policy and technically through tighter specification of the content and pace of their work.
As mentioned earlier in this chapter, teachers have experienced a distancing between themselves and the principal or leading teachers. This follows trends in New Zealand (Wylie, 1997, p117), and England (Whitty, Halpin and Power, 1998, p66). Blackmore (1995, p7) notes:

New hierarchies are emerging as principals are increasingly distinguished from other teachers in terms of different forms of performance pay, decision making responsibilities and their industrial relations role. New hierarchies are forming between teachers as categories of leading teachers are constructed.

Blackmore found the changes tended to have a detrimental effect on personal and collegiate self reflection (1995, p7). School based change initiatives were impeded by the restriction on ‘teacher talk’:

Teachers spoke about the intensity and breadth of the changes they were expected to implement in a short period of time. They spoke about how the shifts in administrative practices meant intensification of labour, more authoritarian and managerial approaches; an increasingly administrative not student centred foci in their work; more attention being paid to the outward/market orientation and image management in response to system community and media generated images of ‘good’ schools in an educational market.

(Blackmore, 1995, p7)

These words were generated by a project which studied the response to change of four distinctly different government schools. They encapsulate my own thoughts and confirm what my research has also found. Teachers find there is less time to talk about teaching. More time has to be found to manage ‘administrivia’.

Earlier in this chapter, I discussed the effect of the marketisation of schools. Regardless of their views on the matter, teachers are involved in this to one degree or another. All realise that their very jobs are dependent on the number of students that the school has, and that those teachers who don’t make an effort to promote the good features of the school might be amongst the first to leave should the student numbers drop. In some instances where the principal and school council have embraced marketisation, teachers must be even more active and involved. The very culture of school life has changed.
Blackmore (1995, p6) writes:

New types of teachers and principals have begun to emerge in schools. A key aspect of their work was the capacity to mediate and negotiate pressures for change that had multiplied considerably.

In an article in The Age, a teacher, Wendy McLean, describes her teaching role as 'a balancing act'. The newspaper stated:

The changing demands of her profession means that Ms McLean is no longer confined to the classroom. She, like most teachers, have taken on several roles that require some deft juggling.

(Jones and Hughes, 1999, p4)

The newspaper article highlighted the changing nature of the role of teaching by referring to a report of a senate inquiry into the status of teaching. The report, A Class Act, stated:

...the complexities of contemporary schooling, whether in curriculum, technology, school-based management or student welfare mean that demand on teachers' skills, time and energy are at an all time high.

(cited in Jones and Hughes, 1999, p4)

One of the less obvious changes to teachers' roles is that of welfare or social worker. The changing social conditions means that many teachers have to attend to more urgent student needs. Schools have set up special programs which deal with issues such as grief, student behaviour management and self-esteem. In an article in the Herald Sun Jeanette Hill (1998, p37) comments:

Schools are finding themselves having to care not just for students' education, but their welfare needs as well. Some schools have been forced to tackle the welfare problems head on with special programs and activities.

The article went on to identify the issues of welfare which were impinging on schools and the areas in which schools were involved. These were:

- Parents needing help with budgeting;
- Parents unaware of available services;
- Parents unable to pay fees;
- Family crises affecting students;
- Families seeking advocate to act on their behalf;
- Emergency accommodation;
- Students wearing tatty clothes; and
- Students coming to school without lunch.

While schools in poorer areas would obviously be involved in more of these issues than others, even schools with a "middle class" mix of students is seeing an increase in the welfare needs of students and is therefore more involved than previously. At our school which is considered to be a mix of students from cheap rental accommodation and middle class backgrounds, the school has been active in at least half of the issues mentioned above.

These problems were identified back in 1995. In an article in The Age, Deborah Stone (1995, p1&2) comments on the role of teachers:

Mediating in cultural clashes, detecting child abuse, replacing failed parents and supplying economic Band-Aids have all become part of a teacher's brief.

The article went on to discuss 'an education revolution that defines a teacher's role more broadly'. It discussed the broadening curriculum dealing with social issues:

Schools must fix violence, Aids, teach road safety, whatever the issue of the day is. And they must do this without losing anything from their spelling, uniform, self-control, or tidiness at the bus stop.

(Stone, 1995, p1 & 2)

Part of the problem has occurred because of the removal of support services from regional offices. Recognition of this fact came in the run up to the 1999 Victorian State Elections, when the government promised to employ 600 new teachers and school councillors to handle welfare issues (Wallace, 1999, p11). This is roughly equivalent to the number that were cut from support services over the last five years.

All of the changes mentioned, from market strategies to welfare issues, have occurred at my school. Teachers have been active in providing transition sessions for pre-school
children or evening information sessions for parents. As well, teachers have been involved in actively canvassing local businesses for monetary or like support. In 1995, for example, the school council sent out a letter to more than 60 businesses Australia wide, requesting financial support for the school science program. We received a $5 donation, a visit from BHP, many letters of response, but no further support of any kind. So much for trying to forge links with businesses! Education week is seen as an opportunity to promote our school to the wider community, not just to show our present parent body what is happening in classrooms. Whenever something special is about to occur at school, the local paper is contacted in the hope that our school will benefit by the positive promotion.

In addition to the marketing of the school, teachers are far more involved in all aspects of the administration. From managing program budgets, to ordering supplies, to writing school policies, involvement in Charter formation and triennial reviews, teachers have to be involved in a wide range of non-teaching tasks. Most of these tasks would have been handled once by the school principal or secretary.

Social problems of children are being handled more and more at the school level. Most children cannot separate their home life from school and bring their burdens to school with them. Recently, I had to organise for a student to see a special counsellor as he was involved in a court case. Fortunately, the school psychologist had a vacancy and was able to attend to him immediately (usually there is a three-month waiting list). However, within three weeks of organising this support, both the child and mother disappeared without any notification to the school! It is very stressful not knowing what has happened to the student. Teachers deal with problems like this all the time. Probably one of the most common is the matter of individual parents who need to ‘chat’. Many parents need reassurance or advice on their parenting skills, some just need a sympathetic ear. A teacher becomes whatever is needed in these circumstances.
7.5  CHANGED SECURITY/MORALE IN THE PROFESSIONAL CONTEXT

In 1993, the state government slashed staff numbers, closed schools and cut schools budgets. All of this was done under the umbrella of economic rationalism, or as stated by Crooks (1993/94, p18):

The unrelenting message over the last twelve months is that Victoria is experiencing a debt and fiscal crisis....The debt and fiscal ‘crisis’ is used to justify all manner of government action.

With so much uncertainty in schools, teachers began to feel intimidated by the changes and morale plummeted. Even while schools were being subjected to such massive budget cuts, media representation indicated that all was necessary for the good of Victoria.

...the electorate rightly or wrongly sees these actions as the necessary, but unpleasant, response to the financial crisis left by the previous government.
(Australian Rationalist, Editorial, No 35, July 1993 - Jan 1994, p5)

There was a ‘condoning’ of the decimation of the education system, by the silence of public outcry. Although teachers went on stop work to highlight the worsening conditions in schools, the pervasive ‘teacher bashing’ attitude prevalent in our society believed what the government said, that teachers had had it easy for many years. Don Hayward, Minister for Education at the time, stated that teachers ‘milked the education budget over the past decade’ (Curtis, 1993/94, p64). That sort of negative publicity, from within the ranks of education, fed the public’s critical image of teachers. In an article in the Geelong Advertiser, Christine Callaghan, VSTA regional spokesperson, said:

In terms of decimating the morale and goodwill of teachers, 1993 has been the worst year.  
(Brdar, 1993. p2)

An article in The Age several years later commented that the public perception of teachers was so low that many teachers were ashamed to say that they were teachers. One teacher in the article commented, ‘The general public and the media think that
teachers are the lowest of the low' (Milburn, 1996a, pA7). The article mentioned that 'teacher bashing', the criticism of teachers by society and media, had increased over the years. Teaching is seen as a low prestige occupation (Holroyd, 1997, p29). Reports in newspapers on teachers' work and job satisfaction have indicated that there are problems in these related areas:

The Flinders and Deakin studies found a morale problem among teachers.

(Milburn, 1996b, p1)

Research on job satisfaction and why teachers resign has found a profession in the doldrums, facing low morale and struggling to cope with the pace of educational change.

(Milburn, 1996a, pA7)

The low morale continued, as teachers faced ongoing changes in work conditions. Redundancy packages targeted teachers who were named in excess, or were close to retirement age. The conditions of the redundancy packages even allowed teachers in their early forties to retire with a substantial remuneration. Teachers with many years' experience were leaving the system and were not being replaced.

The reasons for low morale have been touched on in the comments above, but will be investigated more closely below.

7.5.1 Impact of CSF and other Workload Factors

Thousands of teachers return to the classroom tomorrow to resume a growing battle against overwork and stress.

(The Age - Agenda, 16 July 1995, p1 &2)

Earlier in this chapter, it was identified that teacher workload had increased significantly since the introduction of Schools of the Future (SOF) and the Curriculum and Standards Framework (CSF). Teacher workload has contributed to teacher stress and reduction in morale as teachers struggle to cope with the continuing demands of an ever-changing system. Mary Bluett (1994, p6), president of the VSTA, commented that teacher morale was the lowest she had remembered due to teachers' "enormously increased workload".
At the A IRC hearing in 1994 into teacher workload, Mr. Bromberg stated:

...teachers were suffering stress and low morale, had little time to prepare for classes and were teaching overcrowded classes.

(Herald Sun, 30 September 1994, p11)

This article went on to prophesy that the introduction of the CSF in 1995 ‘would also place new pressures on teachers.’ This has proven to be correct. A teacher commenting on the introduction of the CSF and its impact said:

...the shift from a school-based syllabus to statewide curriculum ‘frameworks’ as one of the most significant changes she has had to cope with.

(Jones and Hughes, 1999, p4)

Within Assessing the Impact (Thomas, 1998, p83), principals identified the implementation of the CSF as having the biggest single effect on teachers. Further clarification indicated that although the introduction of CSF was considered to be a positive change to the school, it was the single most important source of increased workload for teachers. Other factors which were reported as contributing to teachers workload were; increased accountability, decreased resources (human, financial, physical), introduction of other DoE initiatives and increased class sizes. This is similar to the findings of Wylie (1997, p144) in New Zealand schools where:

...the main impact of the NZ curriculum on teachers’ own work, mentioned in response to an open-ended question, was an increased workload.

Also within that report, it was noted that a definite correlation existed between workload and morale:

Teachers with good or high levels of morale worked fewer hours than those whose morale was less than low.

(Wylie, 1997, p86)

In 1997, the Australian Council of Trade Unions (ACTU) undertook a survey of stress in the workplace. Over five thousand respondents listed the main causes of stress. Of
these, 56% identified 'increased workload' as one of the leading causes of stress. (AEU News, September 11, 1997, p12). One teacher commented:

Apart from teaching, we are also expected to be councillors, carers, advisors to parents, writers of curriculum, reports, programmes - not to mention learning new skills in our 'own' time - I don't have any 'own' time left...

Victorian school principals also noted that the manifestations of increased workload were teacher burnout and a decline in morale (Thomas, 1998, p83). In *The Age* survey (21 July 1999, p4), comments from principals regarding workload and stress included:

Good teachers are more and more getting to the edge of breakdown.

Workload pressures mean that, to avoid burnout, we have many teachers acting in survival mode, especially the older ones.

A Federal Senate inquiry into the status of teaching, *A Class Act*, reported that teachers were experiencing 'a widespread crisis of morale' (Jones, 1998a, p8). The report indicated:

Excessive workload was identified as the most significant contributor to stress and low morale. Classroom teachers are overworked, unfulfilled and feel unappreciated.

(Jones, 1998a, p8).

One principal indicates the schools and teachers cannot work indefinitely in this way:

The workload on principals and staff is not sustainable in the long term...We risk burning our best people out.

(Hunt, 1999, p4)

Around the state, teachers are voicing their concerns about workload, stress and morale. At a Focus Group meeting, for writing the Science Course Advice, one teacher commented that she would not recommend teaching to her children as a career option (Journal entry, 22 May 1998). Another teacher, a young graduate currently employed at Melbourne Ladies College, remarked on the difference between her present school and
doing rounds in state schools. She said that in her current position there was less strain. She added that at that time, there was no push to address all the DoE initiatives and therefore being a teacher was less stressful. ‘We don’t even do the CSF’ was one of her comments, although she admitted that they might eventually be introduced. She said that on her rounds there was significantly less pleasure and fun at the staff room table (of state schools) and that ‘teachers looked tired and worn out’.

Within my own school, the added workload certainly has contributed to teacher stress. There have been incredible arguments amongst teachers fighting over bookshelves because there have not been sufficient funds to buy new furniture for an additional classroom. Normally this debate would have been solved in a reasonable way without these teachers resorting to a screaming match. However, stress levels have been so high at times, that teachers are on the edge. On another occasion, a teacher ended up in tears over a small remark addressed to her. She explained afterwards that she was becoming despondent over the workload and felt that she was not able to give the students the best learning experiences due to other responsibilities encroaching on her time. As one of the other teachers commented:

...we are expected to do too much and as conscientious teachers, we find that we cannot cope with the ever increasing load.

(Journal entry, 5 March 1999)

In an interview with another teacher at the school, the following comment was made regarding workload and the CSF:

...we have so many responsibilities... It’s an impossibility for us to cover those eight areas thoroughly... I think it’s impossible to do all those areas justice as one teacher... There’s just so much preparation, you just can’t do it. You haven’t got the hours in the week.

(Interview JM, 15 April 1999)

What is the impact of increased workload? For teachers it has been identified as stress and burnout. But what about the indirect impact on students? Alan Lawrence, principal of McKinnon Secondary College, commented:
There's a high correlation between staff morale and student learning, so if you introduce something that makes staff morale worse, you have to ask yourself whether it's worth doing. (Jones, 1999b, p3)

This statement is further supported by *Assessing the Impact* (Thomas, 1998, p106) where direct links are made between teacher morale and improved student outcomes.

### 7.5.2 Teachers' Career Structure - Professional Recognition Program

The ACTU survey conducted in 1997 on workplace stress recognised the role of the career path on the overall morale of workers. Sixty-five per cent said that 'job insecurity and lack of career paths' was a majority source of stress (*AEU News*, 11 September 1997, p12).

The current career structure for teachers in the state system is called the Professional Recognition Program (PRP). One has to ask what aspect of the 'profession' it is recognising! This career structure was implemented as part of the Schools of the Future Program (SOP). How is the career structure related to teacher morale? To answer this, I need to revisit some information mentioned earlier in this document. When I first came into teaching in 1989, the career structure was based on seniority and teachers were placed on a list depending on their years of service. A teacher could gain an accelerated promotional classification, but then had to wait for a position to be available before that classification could be taken up. Even then, if someone else higher up the promotional ladder was interested in the same position, then she had priority. This system did not allow for promotion on the grounds of merit and disregarded all aspects of teaching ability. It was replaced in 1991 with the Advanced Skills Teacher (AST) scheme. This system of recognition rewarded good classroom teachers and any teacher with the relevant experience could ask for a reclassification. Under the AST scheme, teachers could not undertake less than 60% classroom duties. In other words, teachers were being rewarded for their classroom expertise and teaching, not additional administrative tasks. It was a merit based system, which rewarded teaching ability. It had one drawback in that teachers with less than ten years experience could not access promotion.
Teachers who wanted to pursue an administrative career in education had another system available, called Senior Responsibility Position (SRP) scheme. In this scheme teachers who took on additional roles such as Curriculum Coordinator were recompensed for the extra work they had to do. Finally came the PRP.

With the PRP, the number of promotional positions are determined by the school and its global budget. Teachers can be promoted from the teaching ranks and merit is recognised. The negative aspect is that most promotional positions are based on the amount of administrative duties a teacher can deal with effectively and does not reward good teaching practice. Those teachers who want to teach and not pick up extra responsibility, cannot be acknowledged in this system. I return to the question posed earlier. What is the PRP recognising? It recognizes commitment to DoE initiatives, ability to change, ability to bring about change in others, preparedness to take on increasingly huge workloads outside the teaching load. It does not recognise sound teaching practice, or personal professional development.

This is only one aspect of the PRP. The other aspect is the Annual Teacher Appraisal. Teachers must 'prove' that they are capable teachers before they can access an annual increment. This is accomplished as a series of meetings with the principal (or leading teacher) where the teacher is asked to select some 'standards' of appropriate teaching behaviour to be achieved. The school then assigns others related to the school charter goals and priorities. The items of proof are designated. About five months later, a midyear review is undertaken to ascertain if the teacher is on task with her suggested standards. Finally, at the end of the promotional year, the teacher presents her itemised proof to the principal to gain her increment. While this system has some merit in terms of assisting teachers to focus on areas of teaching or professional development, the fact that it is tied to annual increment has upset many people. Rather than anticipating that a teacher will do a good job, it is asking for proof. Rather than a principal having to prove that a teacher is not worthy of receiving an increment, it is up to the teacher to justify her teaching style and practice. This is similar to the annual performance review of principals and leading teachers. In an article about annual reviews, the following statements were made:
Teachers and principals no longer just have to do a good job, they have to prove they are doing it. For many participants the system is time-consuming, demeaning, full of conflict and threatening.

(Graham, 1997, p7)

In Assessing the Impact (Thomas, 1998, p83), Victorian school principals identified the PRP as impacting on teachers lives in many different ways. They stated that it had increased the accountability of teachers through annual reviews and promotional positions. It had improved the professionalism of teachers again through critical appraisal. However, despite the PRP being hailed as a success, principals reported negative aspects as well in terms of teachers’ careers:

- Career uncertainty;
- Decreased opportunities for staff to transfer between schools; and
- Lack of career structure.

(Thomas, 1998, p83)

Within this report, the negative impacts outweighed the positive impacts.

Teacher morale is directly affected in a number of ways. Firstly, with the promotional situation, no amount of good teaching will allow a teacher to gain promotion. Expertise and skills go unrecognised professionally. In addition, the number of promotional positions are limited and even those teachers with the requisite skills, are often not rewarded for taking on an increased load. Many teachers wonder just where they are going in teaching. When talking about job satisfaction, one teacher stated:

I’m at a dead end. So few senior positions are advertised these days that it would be impossible for me to get promoted. There’s no real incentive because schools just don’t have the money to appoint more senior teachers.

(Jones, 1998a, p8)

Secondly, with the annual teacher appraisal, many are indignant at having to ‘prove’ themselves to be good teachers. Most teachers believe that an active and alert principal should be able to observe his/her staff in situ. Student results also give an indication of a teacher’s effectiveness as a teacher. As with any form of assessment, there are many
ways to gain information. The Annual Teacher Appraisal is, for many, just a further encroachment on time and an addition to workload. As one teacher at my school commented:

...I object to being made to jump through the hoops, surely our principal knows what sort of teacher I am.

(Journal entry, 1 August 1997)

7.5.3 Increased Casualisation of the Workplace

11.9% of all state school teachers are employed on short-term contracts.

(Jones and Hughes, 1999b, p4)

Of this number, 64% are on contracts of less than one year (i.e. 7.6% of all teachers). This is still down on what the DoE would like to see in schools as part of full staffing flexibility (personal communication, Brian [pseudonym], 1997). In a conversation with my principal several years ago, he indicated that at a DoE principals’ meeting, principals were encouraged to increase their contract staff to about 30% of the total staff. This would allow more flexibility in a range of different circumstances, particularly if student numbers dropped. According to The Age (5 April 1998, p8), ‘contract employment is increasingly replacing permanent employment.’

The introduction of contracts affects both permanent and new teachers. Teachers who gain a promotional position have to sign a limited tenure contract, the average length being about three years. At the completion of the contract term, if the school no longer has a need for that position, or redefines its leadership profile, then the promotional position is lost to the teacher. Teachers who are employed to fill short-term vacancies from six weeks to a year, find themselves without a position at the end of the term. Contracts of this nature do not allow for any long term financial planning or career structure. At a Focus Group meeting in Melbourne, several experienced teachers were commenting on teaching prospects and they stated:

...There was no future in teaching for new graduates, with limited tenure and no guarantee of a future job.

(Journal entry, 22 May 1998)
As identified earlier, the ACTU national survey of workplace stress indicated that 'job insecurity' was one of the contributing factors to stress. In related discussions about teaching as a profession, Ms Bluett AEU Victorian Branch President stated:

...and the introduction of contracts for teachers was also deterring young people from entering the profession...

(Jones and Hughes, 1999b, p4)

One young teacher was forced to endure seven interviews in two years because her position was either reclassified or readvertised. She talks about the insecurity of her position having an affect on her health and her future.

Contract employment makes it difficult to take a rental lease, or buy a new car. This year...I will be able to make long term plans and begin establishing a future.

(Jones and Hughes, 1999a, p4)

In a letter to the editor, Jan Thomas, a senior lecturer in mathematics education stated that;

The current system (of contracts) operates in favour of the better-resourced schools - state, Catholic and private - that pick the best of the contract teachers and offer them ongoing positions.

(Thomas, 1999, p14)

Thomas makes the additional point that there are already curriculum areas with teacher shortages and believes that these teachers should be secured by the option of ongoing employment.

In a letter to the Age (8 February 1999, p8), a young education graduate wrote a whole article entitled 'Why I won't become a contract teacher'. Sean Pywell (1999, p8) states that he is the type of teacher that the Victorian Government wants, 'highly qualified in science, able to teach across a broad range of curricula, highly literate, committed to students' physical and social development, and with several years experiences working outside teaching.' However, the current system of contracts has caused this teacher to seek employment elsewhere.
He writes;

Contrary to claims by the Education Minister, Mr Gude (The Age 2/2), the contract system is a direct disincentive to many new teachers, destroying them before they can flourish. Contracts mean constantly rebuilding your, and your students' foundations, thus undermining the development of quality teaching and learning. They leave one with no promise of employment next term, they do not cover holidays, and make it impossible to obtain a loan, to start a family, or to plan a future.

Mr Gude claims that only 12 percent of teachers are employed on contract. This may be true, but it is undoubtedly far, far higher for beginning teachers.

So, I have taken a job outside teaching.

Similarly, in The Age, another contract teacher, Don Cummins, wrote about the disadvantages of the system (Cummins, 1999, p15). He indicated that he could not apply for positions of responsibility in the school, nor could he access the laptop computer leasing arrangement because of his contract status. As he stated, "...a new underclass of teachers has been created in our schools". This teacher pointed to the disadvantages of working for the entire school year, but only being paid for the ten or so months of actual teaching time, to having to seek new employment every few months, having to reapply for your own position and sit through numerous interviews for the job in which you are already employed. He completed his article by saying that for beginning teachers, teaching "has become an underpaid and insecure road to disappointment."

Phil Gude, Minister for Education, attempted to refute many of these claims in an article in The Age (Gude, 1999, p15). He actually confirmed one of the statements made by Don Cummins. By stating that a position advertised internally could only be accessed by continuing teachers, he confirmed that Mr. Cummins could not apply for promotional positions within the school. Phil Gude added that fixed term employment has enabled schools to manage enrolment variations and curriculum priorities. Whilst this may be correct, the education system stands to lose many good teachers if there is no opportunity for permanency. Phil Gude stated that "fixed term employment often leads to permanent employment". This caused me some concern as I had believed, like most primary teachers, that permanency was no longer granted in education. On
discussing this with principals of both secondary and primary schools, it appears that there may be some confusion existing within the system. Secondary principals state quite strongly that they can give a teacher permanency, or ongoing status, by making the position they apply for an ongoing one. Some primary principals believe that they can only employ teachers under contract, albeit an open-ended one. Apparently the truth of the situation lies somewhere in between. A teacher may achieve an ongoing position at a school if they are successful in defeating outside applicants for the position they have previously held under contract. If the new appointment then takes them past the twelve months at that school, they are considered an ongoing staff member of that school only. They do not have permanency within the Department of Education. If the school can no longer maintain the position, it is the school’s responsibility to attempt to relocate the staff member at another school within six months, or undertake redundancy procedures. This perception that permanency is not achievable in primary schools adds to the dilemma facing contract teachers who may believe that there really is no future in primary education.

The senate inquiry, *A Class Act*, pointed to the career path of teachers as ‘unattractive’, stating ‘lack of remuneration for experience and the poor opportunities for promotion’ (Henderson, 1998, p17). It was considered to be one of the factors in contributing to teachers low morale. Solutions were offered. The suggestions were;

Better working conditions, remuneration, opportunities for professional development, or renewed belief in a dedicated profession.

It is over a year since this report was released. I see no evidence of a change in teachers’ circumstances.

### 7.6 COPING WITH ‘BIG PICTURE’ ROLLING CHANGES

In this chapter, the issues of workload, changes in curriculum and teacher’s role, power relations and teacher stress and morale have been thoroughly discussed. Why have I done this and what does it mean? I have provided overwhelming evidence that a
teacher's lot is quite different now from what it was five or six years ago. Workload has increased dramatically as a result of the introduction of the SOF program, through such initiatives as CSF, LAPs, Kidmap, Early Years Literacy and Numeracy, LOTE, Learning Technologies and a myriad of other DoE requirements. The curriculum has changed from process-based to content/outcomes based. This has required a huge amount of additional input from teachers in assimilating the new material, adjusting teaching practice and generating new assessment and reporting methods. The teacher's role has changed, both in terms of the 'market' philosophies of education and in terms of its multiplicity - being many things to many people. The crowded curriculum has contributed to this. Within schools, it is recognised that principals wield more power over other staff. The working relationships of principal and teachers is directly affected by the manner in which the principal exerts that power. It can even be affected by the perception of power, rather than the reality. The end product of these changes is an increase in teachers' stress and poor morale.

Although there is now widespread recognition of the issues of increased workload and teacher stress, there has not really been a concerted effort to alleviate the problems. In fact, the changes keep coming. Early Years Numeracy is expected to be introduced to schools in the year 2000, as well as moving the Early Years Literacy strategies up through the primary school. Science has become a priority area, with money being invested in providing professional development to teachers and a one-off grant for science equipment in schools. Add to this the Middle Years Research and Development Project (MYRAD) which aims to address the plateau effect of educational achievement in years 5-8, and the initiative of 'Consistency and Moderation' for assessment and reporting, and it becomes clear that there will be no easing of the pressures on teachers.

In an effort to reduce the impact of the CSF on an ever-burgeoning curriculum, the CSF has been reviewed and simplified. I believe this is too little, too late. Other factors need to be considered such as reducing class sizes by increasing the number of teachers in each school, allowing more time release to cope with the increase in administrative tasks, improving the morale of teachers by recognising their professionalism, allowing
more promotional positions so that those with increased loads are recognised, at least monetarily, for it. Far more needs to be done!

The next chapter will revisit some of the aspects of science teaching in relation to the issues of overwork, curriculum, power relations, teacher's role, morale and stress. I will clarify the direct role these changes have played on my science teaching practice over the years of this thesis study.
CHAPTER EIGHT

SPECIFIC ISSUES FOR SCIENCE TEACHING

This chapter will study the effect of specific issues in relation to science teaching. It will look at the role of contemporary educational theory, the effect of the contextual changes on science teaching practice and the ways in which a range of related issues are expressed in the field of science education. By drawing on the experiences of teachers in the field teaching science, it will answer the main research proposal.

How do primary teachers develop and teach a quality science program in light of the structural and policy changes occurring in education in Victoria?

8.1 ROLE OF CONTEMPORARY EDUCATIONAL THEORY IN VICTORIAN SCIENCE CLASSROOMS.

There appears to be little evidence that the committees took cognizance of the important issues in the schooling of science: gender and science education, the Science, Technology and Society movement, the role of the history and philosophy of science, changing conceptions of scientific literacy and science for all, and the psychology of learning among other things.
(Dr Roger Cross, The Age, 8 November 1994, speaking about the development of the Science CSF)

When thinking about the role of contemporary educational theory, I had to ask myself exactly what this meant. Within the school setting, contemporary educational theory plays little or no role; at least, not in a way that teachers articulate explicitly. The only time teachers learn of new developments in educational research is under the following circumstances:

- As part of ongoing studies that teachers undertake independently;
- As part of DoE initiatives, such as Early Years Literacy or SET for Success;
- As part of research groups involved in the preliminary stages of DoE projects, for example Early Years Numeracy or the Middle Years Research and Development Project;
• Through membership of specific teacher subject organisations, which is rare in primary schools; and
• Sometimes through commercial publications advocating a research base for the material produced.

The top-down approach to curriculum development through the imposition of new DoE programs means that teachers rarely have time to advance their knowledge by undertaking personal research or educational reading. The discussions at recess and lunchtimes, traditionally a sharing time, have diminished as other matters take up teacher time. Blackmore (1995, p7), in a study of four Victorian state schools, comments:

There was widespread agreement amongst teachers in all case study schools that the demands of the system with increased meetings, reporting and administrative tasks, and more students was to the detriment of personal and collegial self-reflection. In effect, this impeded rather than facilitating school based initiatives by restricting ‘teacher talk’, the mode by which teachers discussed in relatively social situations the nature of their work, the welfare of students, and swapped strategies about curriculum and pedagogy.

There are some issues of contemporary educational research which are known about and understood in schools. Unfortunately, without significant support from the principal or the DoE, these issues tend to remain theoretical rather than practical applications of knowledge. Issues like gender equality, while all teachers are aware of it, and most would say that they practise gender inclusive principles, are generally not at the forefront of educational practice (unless the school is reviewing its social justice policy). It is interesting to note that in 1993, when I was involved in writing the Equal Opportunity Policy for Girls, it was recommended by the principal that it be changed to cover all aspects of social justice. Equal Opportunity for Girls no longer had the credence and support from the ministry it had once received. Similarly, the most recent social justice policy mentions all disadvantaged groups, without indicating that gender equality is by far the biggest issue, for our school at least.

Other issues which are known about, but not necessarily put into practice, are the principles of constructivism and the use of children’s questions to aid teaching. Whilst
most teachers have heard the word 'constructivism', generally they would have a very simplistic understanding of what this means. Using children's prior experiences on which to build their learning would probably be the accepted understanding. Again, while teachers acknowledge the benefit of children's questions, I doubt whether many would use this strategy in planning units of work.

There other areas of contemporary educational theory which are becoming more widely known. Particularly the research into the middle years of schooling (years 5-8), in which a plateau area of learning is thought to exist. Schools need to address this issue and because the Department of Education is now providing additional funds to support research into this area, at least awareness of this issue is growing. Whether there will be sufficient funding to implement some of the wide-ranging changes suggested by the research is another question.

In undertaking my doctoral studies, I have become aware of many other issues of contemporary educational research, particularly as they relate to science education. These include the science-technology-society links, environmental educational and where it fits in the curriculum, formative versus summative education, interactive teaching and interpretive teaching. However, until my principal or other teachers at school indicate a need to learn more, I have found it to be useless to make suggestions of professional development based on this new information (and I have offered!) Teachers just have too much to cope with now to take on anything else. Even in my own teaching, as evidenced by my action research project, it is difficult to tackle too many changes concurrently.

8.2 EFFECT OF CONTEXTUAL CHANGES ON SCIENCE TEACHING PRACTICE

Earlier chapters of this thesis demonstrated the types and extent of contextual changes on teachers and their teaching role. Workload, involving increased class sizes and fewer teachers, lack of preparation time, accountability demands and structure of professional development, has impacted severely on teachers' practice. Add other issues such as
changed power relationships, marketisation of schools, the crowded curriculum, CSF introduction, decrease morale, increased stress and it is evident that it becomes increasingly difficult to maintain an enthusiastic, vibrant approach to the practice of teaching. Yet, despite this, it is what teachers are attempting to do.

Blackmore (1995, p7) stated:

In effect many teachers individually and collectively changed; but...in how they channelled their time and emotional and intellectual energy to protect educational values. They changed their practices in order to maintain quality teaching in underresourced overcrowded classes.

The intention in the remainder of this thesis is to consider what effect these contextual changes have had on science teaching practice in particular.

8.2.1 Importance of Science Education

There is firm evidence of the lack of importance placed on science in the primary curriculum. In the DoE's statewide figures on the time spent on each curriculum area, science comes in very poorly. Across the years 1996 and 1997, schools reported spending 4%-5% of the teaching time on science (The State Benchmarking Materials 1996-97, DoE). This equates to between 60-75 minutes of science per week. According to these statewide figures, science and technology were the KLAs that teachers spent least time on. All other areas of the curriculum were given at least 6.5% of teaching time (minimum 95 minutes). At our school, the figures were about the same for science, 4%-6% of teaching time (Triennial Review Figures, Maxwell [pseudonym] Primary School, 1999), or approximately 60-90 minutes per week. I believe that even these figures might be an overestimation. Primary schools are now committed to giving literacy at least ten hours per week, maths at least five hours per week, LOTE and Health and PE about three hours each. That accounts for at least twenty-one hours of school time. The other four KLA's only have four hours per week allotted to them. These figures do not include excursions, assemblies or other interruptions. Even allowing for an integrated curriculum approach, it is difficult to see how schools can do
justice to the remaining four curriculum areas. One hour of science per week is probably more accurate.

Earlier this year while talking to another teacher at a conference, he commented on primary school science:

...his comment was ‘there aren’t too many schools or teachers teaching science, are there?’ This is the general conception amongst most teachers. That although science is taught by some teachers, most teachers have a very ‘relaxed’ attitude to science as an important curriculum area.

(Journal entry, 20 February 1999)

Student teachers on rounds have also commented on the lack of science teaching that they see in schools. One student teacher attending rounds at my school stated that:

...science wasn’t given a priority in primary schools.

(Journal entry, 16 October 1998)

Other student teachers have commented at Deakin University about the lack of science in primary schools:

...there was not much science teaching occurring in primary schools.
...there were pockets where schools were teaching science but on the whole that it just wasn’t a priority.

(Journal entry, 19 November 1998)

A previous student of mine, who now attends secondary school, was commenting on his teacher’s attitude to science and how many new secondary students were really excited about doing science because:

...most of the other students don’t seem to have done any science in their primary school.

(Journal entry, 19 March 1999)
8.2.2 Workload

Some people would argue that lack of primary science has always been a problem and I would have to agree that this would appear to be the case. However, consider how much more difficult it is to implement science given the overwhelming workload faced by all teachers. The principal of my school, talking about teachers undertaking science stated:

...most teachers just find it too hard to take science with all the other pressures placed upon them.

(Journal entry, 2 February 1999)

In an interview situation, one teacher commented that it was the content of the CSF which had slowed up her science teaching. She had always based her science teaching on the interests of the students but found the CSF content difficult:

...the CSF - they're not always based on the interest areas of the children...what this CSF thing's done is put emphasis on topics in science that normally I wouldn't have considered that the children had a great interest in.

(Interview, JM 15 April, 1999)

The teacher made further comments about workload saying that it was an impossibility to cover all eight curriculum areas with any thoroughness. Yet another teacher talked about the constraints on her science teaching and how lack of time was an important factor:

If I have to get out so much stuff and get so much stuff organised and I don't have the time, I can't do it (science).

(Interview JR, 3 September 1998)

When discussing the situation at another school, the teacher commented that, despite a huge school emphasis in science several years earlier, that the teachers actually did very little science, did not plan together and that a science program really didn't exist:

Q - Is there much co-planning in terms of science?
A - No! None! None!
Q - Are you the official science program leader?
A - Yes. Is there a science program? Not really! No!

(Interview JR, 3 September 1998)

It is recognised that science is not being taught much in primary schools and that the reasons for this vary from teacher to teacher. However, whatever difficulties are reducing science teaching are compounded by the fact that teachers are overworked and stressed.

At the time of writing this thesis, the DoE has decided to boost funding in the area of science education. They are doing this in a number of ways, but at the practical level, funds are being allocated for the provision of professional development and to schools to purchase equipment. The money for equipment comes with the proviso that schools send staff to relevant PD sessions on the use of science equipment. I am involved in the development of these sessions. Already I am disappointed that funds have not been made available to schools to cover the cost of replacing staff who attend PD sessions. Essentially, teachers will be required to attend out-of-school hours PD sessions to gain the resource allocation. Again, there is no bureaucratic recognition of the workload for teachers.

8.3 PROFESSIONAL DEVELOPMENT & WORKLOAD

As discussed in Chapter Seven, professional development has undergone changes over the last five or six years. Firstly, the number of pupil free days, traditionally used for network professional development sessions, have been reduced. Secondly, professional development through the DoE began to mirror DoE initiatives. Professional development was seen as a vehicle to bring teachers into line and up to date with DoE policy. The focus of PD moved away from teaching and learning to areas like assessment and reporting or how to use the DoE packages such as the CSF. Key Learning Area Networks were set up to assist teachers in becoming familiar with the CSF and its accountability structure. These were funded at about $1000 for the first two years, reducing to $500 in the third year of operation. Teachers volunteered their time to operate these networks which met on a monthly basis for several hours after school.
The Science KLA Network operated from 1995 until 1998, although other networks ceased operation at the end of 1997 due to the withdrawal of funding. As I was the Science KLA Network leader for the Geelong North District in 1997 and 1998, my agenda was to attempt to help teachers in gaining skills and understandings in science. The CSF was part of this, but from my point of view, was not the most important aspect. In 1995, meetings attracted between thirty and fifty participants but over the next few years, numbers declined. This was occurring in the other KLA Networks as well. Although the Networks were guaranteed additional funds at the Network Leaders Conference in August 1997, by November 1997, funds had been cut. Eventually, due to declining numbers, the Science KLA Network was the last one to cease operation in December 1998. Other DoE initiatives had taken priority over the need for KLA Networks. New networks had sprung up, financially supported by the DoE - the Early Years Network, the Middle Years (grades three and four) Teachers Network, the Numeracy Network, the Middle Years of Schooling Network.

With the introduction of Schools of the Future, schools were expected to carry the bulk of the cost of professional development and were accountable if the teachers did not become familiar with incoming DoE initiatives. While schools were required to take on more of the responsibility for resourcing PD, external providers became more and more expensive. In the Geelong region, regional curriculum consultants took on the task of providing PD relevant to DoE initiatives, with a minimum cost to schools (schools still had to provide replacement staff). Most PD sessions were provided out of school hours. There was no obvious pressure from the DoE for schools to attend. However, by the very imposition of change, and the requirement to implement change, schools, and indeed teachers, felt compelled to seek out further information in the form of PD sessions. Unfortunately, teachers and teaching practice are damaged by this narrow definition of professional development. There was and is no opportunity for personal growth or for reflective teaching. Professional development is defined within the confines of the accountability frameworks of the SOF program.

In more recent times, some of the DoE initiatives have been related to improving teaching practice, and appear to be based on some definite research. Projects like the
Early Years literacy and mathematics, and Middle Years Research and Development projects are addressing perceived needs in student learning. In the area of science, the DoE has launched the ‘SET for Success’ project based on the Science Engineering Technology strategy (Science Engineering Technology Strategy, 1998, DoE publication). At the primary level, the science CSF is promoted as the framework for curriculum planning and assessment and reporting in on student achievement. Professional development for teachers mainly relates to the development of competencies in handling equipment. Research in recent years indicates a need to develop a teacher’s conceptual base in science (Tytler, Smith, Grover & Brown, 1999). As part of the professional development strategy, some money will be made available to subsidise 100 primary teachers to undertake a Graduate Certificate in Science which will be based on improving teachers’ knowledge base. Similarly, ‘Extended Professional Development in Science’ courses have been offered in 1999 (and again in 2000) to improve teachers’ understandings and confidence in science. Unfortunately, at this stage, only a small number of teachers have been able to access these sessions. Again, they are offered for three hours each week for six weeks at a cost of $120 per participant. This is a large commitment in terms of time outside school hours. There is no indication that the completion of this course will benefit a teacher in any way other than personally. By this I mean that the DoE have not offered any real incentive for teachers to undertake any extra study. Even the Graduate Certificate in Science does not count as the fourth year of study required by the DoE. With workload demands so high, I believe that few teachers will commit themselves to these professional development opportunities without some further concrete benefit or recognition from the DoE.

8.4 CHANGES IN ROLE: SPECIALIST VERSUS CLASSROOM TEACHER

With the reduction in staffing in 1993-4, one of the main casualty areas was that of specialist staff. As schools had to reduce staff, decisions had to made whether to retain specialist staff but increase class sizes, or whether to decrease class sizes but reduce specialist teachers. Despite losing their preparation time, most teachers opted for smaller classes which would improve students’ learning opportunities. Curriculum
programs in library, art, music, science, technology, computers and PE were cut as specialist teachers were taken back as generalist classroom teachers or left the system altogether. Some schools used a rotational system so that the expertise of individual teachers wouldn’t be lost, however it was a difficult situation without the necessary preparation time most specialist subjects require. In other schools, classroom teachers took up the role of teaching in these specialist areas. Yet other schools financed the hiring of specialist teachers from their global budgets to the detriment of other needs in the school.

In 1994, a visiting teacher from Scotland, Rosey Whittles, commented on the situation of specialist teachers, comparing the systems of Victoria and Scotland:

It seems very sad there are cuts to specialist areas - you have to do it all yourself. In Scotland, there are a lot more provisions. Here, we've got no free time. This school continues to offer all the specialist areas, but it's stretching teachers to the full. We haven't got the resources for it.

*(Geelong Advertiser, 2 December 1994, p10)*

Mrs. Whittles went on to discuss the need for more specialist teachers and commented on the possible effect of insufficient staff:

She said State schools needed more specialist staff, such as physical education and music teachers, as well as more general teachers. She believed teachers may reach the point of exhaustion if work demands continued...

*(Geelong Advertiser, 2 December 1994, p10)*

Those comments, recorded in 1994, have proven to be correct in light of the immense workload that keeps continuing for teachers. The issue of specialist staff is still of concern. Most schools have had to employ specialist staff in order to provide classroom teachers with adequate preparation time. This has had to come out of the school’s global budget which means that there is less money for the provision of other programs, maintenance or student resources. Very few specialist staff are given sufficient preparation of cleaning up time themselves. Prior to the current funding arrangements, specialist teachers of heavily practical subjects such as art, were given approximately one hour’s preparation time for four hours of teaching. Now, if the school is generous,
they may receive thirty minutes. Most specialist staff work part-time and supplement their preparation requirements with their own time.

Despite schools hiring some specialist staff, many teachers feel that there are further needs which are not being addressed. One teacher indicated that she was worried by the lack of science teaching in primary schools. She said:

I just don’t believe that topics such as science can be done adequately because there just isn’t enough knowledge in the primary teaching section.....I think in the primary level itself, there’s a shortage of science education and I think its one of the specialist areas that we really need someone leading us.

(Interview JM, 15 April 1999)

Further comments from this teacher placed science in the context of a difficult area to teach and that most teachers suffered from ‘a feeling of inadequacy’ due to the lack of content knowledge. She added:

Science is, for most primary teachers, a different language just the way Japanese might be, a whole different level of understanding that many people haven’t been exposed to and that’s why we need some expertise in it.

(Interview JM, 15 April 1999)

This was confirmed by comments from another teacher who makes science a priority in her grade:

I’m not a scientist. I struggle to understand the physical rules, the concepts and things like that. So if I struggle, then I have to make damn sure that the kids that I teach aren’t going to struggle.

(Interview JR, 3 September 1998)

The issue of science teaching being a specialist area or not is contentious in itself. The lack of background knowledge of most primary teachers in the area of science is sufficient reason to indicate that science should be undertaken by a person with specific science training. An enthusiasm for science is also necessary to engender similar responses in children. However, the answer lies in the practicalities of the situation. There are just not sufficient numbers of scientifically literate primary teachers to have
science as a specialist area. However, if teachers do have a strong science background, then there is no reason why science, just like art or music should not be considered an area that lends itself to a specialist approach. Currently, the DoE has a huge ‘push’ in science and many of its directions include the training of teachers. This was discussed earlier in this chapter. An extended professional development program is being offered to teachers which will include a strong component on concept knowledge. Much more needs to be done to improve the scientific literacy of primary teachers. Incentives need to be included along with the professional development so that teachers embrace the idea of furthering their understanding of science.

As a person with a strong science background, I came into primary teaching as a science specialist. It was a role that I really enjoyed. However, with the cuts in education, it was decided at the school level that it was impossible to keep this position going. Maybe it was for a short time, however reflection on the school situation across the last five years have indicated that it goes further than this. The school has been buying in specialist teachers for the last few years, plus allowing a 0.6 load teacher to undertake a specialist program. It continually comes down to resistance on the part of staff and the principal to reinstate science as a specialist area. Some teachers would comment that they undertake science, but most would agree that they don’t do enough. Statistics gathered for the school’s Triennial Review supports the claim that there really is not much science being attempted at our school. It even comes in lower than the state average. Each year, when the school staff are discussing staffing options, I raise the issue of science becoming a specialist area but to no avail. There are always other priorities. Earlier on (1995-97), lack of money was given as the reason for reduced commitment to science and staff perceived that other areas of the curriculum (such as literacy and numeracy) needed development. In more recent years, the emphasis has been on learning technologies as over $30000 of school funds are committed to maintaining the computer network each year and the part-time teacher has taken on the role of Learning Technologies Coordinator. In acceptance of the situation, I have offered to assist teachers in their science teaching. Again some teachers make use of the offer, but most don’t. In many cases, teachers admit that taking science is just too hard
sometimes. As well as that, when they do take some sort of science lesson, they have confidence that they have completed a satisfactory lesson and don’t need any help.

8.5 RATE OF CHANGE: MORALE/WORKLOAD ISSUE

The DoE has introduced change at an alarming rate. In fact, the rate of change has itself been identified as a contributing factor to teacher stress (Thomas, *Assessing the Impact*, 1998, p83). The successful implementation of these changes engaged teachers fully over the years, not allowing for any other school based endeavour. Listed, these changes are:

- Quality provision Framework, 1993-94
- School Charters, 1994-95
- School Global Budgets, 1995-96
- District structure, 1994-97
- School-based Personnel Responsibilities, 1995-98
- School Council restructure, 1995
- Curriculum and Standards Frameworks, 1994-95
- Learning Assessment Project, 1995
- Assessment and Reporting, 1996
- Professional Recognition Program, 1995-96
- Early Years Literacy, 1997-98
- Middle Primary school literacy, 1999-2000
- Self-Managing Schools, 1998
- Turning the Tide, 1998
- Early Years Numeracy, 1999-2000
- Middle Years of Schooling, 1999-2000
- SET for Success, 1999-2000

While some of the changes above are policy changes and others relate directly to classroom procedure, all have impacted on teachers across the years. The ones marked
with an asterisk have impacted most heavily in terms of my workload and probably that of most other teachers.

I do not believe there has been any progress in the development in science teaching practice over the past few years. Those teachers who are interested and involved in teaching science are either continuing with what they have always done, or are struggling to adjust their teaching to match the science CSF. There is no time for anything else. As mentioned in Chapter 8, sections 8.1 and 8.2, contemporary science theories are essentially unknown in the circle of primary science teachers and where they are known, most teachers would carry too heavy a load to be able to address them in their teaching practice. Unless given a large amount of extra support, through whole school approaches, principal support or through undertaking studies which have a form of peer support, most teachers do not have the time or ongoing motivation to continue implementation in face of the large barriers of overwork and other priorities. Instead, I would suggest that there has been a real decline in the amount and quality of science teaching. The CSF, with its outcomes based curriculum and tightly specified strands and sub strands, has stifled science for those teachers who were once quite creative in their approach. The curriculum document prior to the CSF (The Science Frameworks P-10, 1987) was, in fact, much more supportive of teachers taking science. It was based on current science research with acknowledgements to many contemporary researchers. The document embraced the Science-Technology-Society (STS) philosophy while advocating a constructivist view to children’s learning. It really was at the cutting edge of curriculum reform.

Despite wanting science to be a priority area, despite trying to motivate other staff in accepting it as an important area of the curriculum, I have fallen far short of my expectations. Even undertaking the action research component of my research became a learning experience for me, not as I had expected in the area of science, but rather in the awakening to the impact of the changes on teachers’ lives. Many times I felt like Don Quixote fighting the windmill - there seemed to be insurmountable barriers to my attempts to undertake critical reflection on my teaching practice. Other teachers,
without my strong commitment to science, must find it increasingly difficult to implement science in light of all the other DoE priorities thrust upon them.

8.6 BUDGETARY CONSTRAINTS

A primary school with about 500 students has a budget of about $1.7 million or about $3400 a student. From this schools have to pay salaries, cleaning, utility bills, maintenance, workcover, payroll tax, superannuation levies, etc. What is left is about $155 a student in primary schools and $240 a student in secondary schools. This money has to cover a huge range of items, including administration, library books, all classroom materials, newsletters, reports, art materials, phys-ed equipment, all replacement furniture, computers and computer software, concerts/awards nights, all VCE materials, all student consumables for technology, science, home economics, arts, drama, music, etc.

(Linnet, Brearley, Szmal, 1998, p15)

There have been huge amounts of money slashed from the education budget in Kennett era. Effectively this reduced the numbers of teachers at each school and the programs offered. Schools have to buy in specialist staff, as cheaply as they can, from money within their global budgets. The global budgets do not carry a wage component, it is meant to supply other needs around the school. Funding for a LOTE teacher is supplied separately which means that the LOTE teacher has become one of the providers of preparation time for other teachers. Often the principal will pick up a small teaching load, also supplying release time and the school has to manage to find funds to support specialist staff for further release time. The timetabling of specialist staff becomes quite complex with many schools only paying for teaching time, not preparation time for the specialists. I am aware of one school principal who hired a music teacher in the following way. She was required to work for 45 minutes and have a fifteen minute break before working for another 45 minutes and so on for the full day. However she wasn’t paid for the breaks, lunch or recess, only the face to face teaching time. She would have been paid for 6 x 45 minutes sessions (four and a half hours) while needing to attend the school for six and a half hours. The principal managed to secure a music teacher willing to take those conditions. Over a two and a half days of teaching, the teacher was effectively paid for two days. In times of tight budgetary management, principals are resorting to all sorts of arrangements to maximise their shrinking
educational dollars. A very common practice, which has virtually stopped now due to adverse publicity, was the instance of paying for a teacher through the term, but not over the holidays. Principals would contract someone for three months until the holidays. Over the holidays they were unemployed, but often reapplied for their position. This continued over the school year. Effectively, principals only had to pay for the forty-two teaching weeks, not the whole year. This amounted to a huge saving for the school of almost 20% of a teacher's salary. However, it was grossly unfair to contract teachers and provided yet another disincentive for young people thinking of teaching as a career choice.

On 17 February 1998, in response to growing publicity about the cuts to funding in education, a four page brochure outlining all 'the facts' on spending in education was included in the two state newspapers, The Age and the Herald Sun. The brochure entitled 'Victorian School Education: The Facts' was a series of statements on:

- increased spending on education;
- Languages - a priority;
- more funds for families;
- the importance of all students;
- higher student achievement;
- computers in schools;
- $1 billion committed for buildings;
- tackling youth problems;
- greater career opportunities for teachers; and
- increased funding for literacy.

This brochure was attacked from a number of sides. Kerry Stephens (Stephens, 1998, p30) wrote into the Herald Sun with the following comments:

In my copy of the Herald Sun (February 17) I discovered a blatantly misleading piece of propaganda entitled 'Victorian School Education the Facts'. Any parent like me who has a child in the state system would consider this bit of creative advertising an insult to their intelligence and counter to everything we know about the parlous state of affairs in our schools. It would be interesting to know the cost of this exercise in duplicity. I'm sure the money could be better spent in areas of desperate need. The true facts are those presented from the Commonwealth last week, which showed Victorian schools falling behind.
Another comment relating to the brochure, came from Beth Sheffield, the president of the Victorian Federation of State Schools Parents Clubs Inc. She writes:

Statistics presented in costly pamphlets will not repair the damage. Rather than waste precious resources on expensive leaflets and advertising, the government needs to concentrate on providing a quality, well resourced education that is accessible to all Victorian students.

(Sheffield, 1998, p30)

Davidson (1998, pA13) comments on the findings of the report on government services by the Steering Committee for the Review of Commonwealth/State Service Provision:

Victoria (down 0.3 per cent) was the only jurisdiction to record a fall in real expenditure. Victoria now spends $5160 a year per government school pupil - $300 below the national average.

In a similar statement, Mary Bluett of the AEU, commented:

How much does the state government provide? Between 1992-96 its spending on education actually fell, while every other state and territory spent more. That is what the Industry Commission confirmed in its 1998 report. Victoria now spends less a head on government school education than any other state or territory

(Bluett, 1998, p19)

Schools have to use their fundraising to compensate for reduced government funding. They do this in a number of ways:

Schools raise money from parents through voluntary levies, donations, tuckshop profits, fetes, raffles and chocolate drives. The privately raised funds are crucial for state schools because it enables them to provide additional education programs, computers and to hire more teachers.

(The Age, 4 May 1998, p3)

Budgetary considerations affect every decision in schools. Resources are assessed by whether the school can afford them. Each area of the curriculum has its own program budget, which is set twelve months in advance. For any school curriculum purchase, approval has to be granted by the Program leader who has to sign a pro forma indicating
that there are sufficient funds for the purchase. Bigger items have to be approved by a
Resources Subcommittee of the School Council. However, within that there are
budgetary areas over which the principal has full discretionary powers. Similarly, if the
school principal recommends spending in a particular manner, it very unlikely that she
(or he) would not gain full School Council approval.

At our school, the reduction in funding and hence staffing had a direct impact on the
specialist programs, with the principal claiming that we had to juggle class sizes and
specialist programs because we couldn't afford both:

Science specialist program scrapped. At tonight's staff meeting, as
we discussed the significance of staff numbers and specialist
programs, the attitude of the staff was to go for smaller classes to the
detriment of release time (and consequently) specialist subjects.
(Journal entry, 13 December 1994)

The School Council President at the time, was quick to lament the loss of the science
program as a specialist area and made further suggestions:

...suggests approaching industry for sponsorship and prepares a letter
in draft form...Over January, we sent out over sixty-four letters to
related industries in Geelong, Victoria and Australia asking for
financial assistance of some kind so that science could continue.
(Journal entry, January 1995)

Over my years of teaching, lack of money was often cited as the reason behind not
taking up the science program again using me as a science specialist. Despite strong
support from members of the School Council, the money for science just seemed to be
reallocated to other areas. Comments from one school council member confirm what is
my personal observation of the situation:

I know from being on the fundraising or resources subcommittee,
they never wanted to allocate anything to science.
(Interview, KM 1 February 1999)
The School Council President supported that view and commented:

There certainly was from a school council perspective, from my own individual perspective at least, a downgrading of science under the so-called leadership of Max (principal - pseudonym)

(Interview, DM 1 February 1999)

He continued by mentioning the tacit support offered to science:

And while Max did seem to be, or say words which seemed to be supportive of science, the end result was that it was always kicked in the head and suffered and no matter what happened there was always 'this case of' ...and money had to be pushed into that sort of area or money had to be diverted there....money was tight and Max seemed to be supportive but in the end, was totally unsupportive.

Further evidence for the lack of support of science came from the way the science budget was often targeted as the area from which funds were often withdrawn:

Yes and everytime they looked at their budgets and they decided to cut somewhere it was always 'Oh well, we'll take some off science' and I'd say 'Well wait a minute'. There were not many of us there, it was always 'We'll take money off science'.

(Interview, KM 1 February 1999)

One instance of this that I am aware of occurred in 1996 while I was attending a two day inservice in Melbourne:

In my absence, the matter of the science funds was discussed and a decision made that the funds were to be used, to continue with a reduced level of support for science (2 hours per week) and to hire a CRT (casual replacement teacher).

(Journal entry, 28 June 1996)

As I was the Science Program Budget leader, this decision should not have been made without my input.
8.7 EFFECT OF CONTEXTUAL CHANGES ON REFLECTIVE TEACHING PRACTICE

The contextual changes in education have been previously documented. The systemic priorities within the DoE which have raised the issues of teacher workload, morale and stress, changed power relations and changes in curriculum and teachers' roles have been clarified earlier in this chapter. The context of individual school situations cannot be dismissed and are of huge importance.

How has my reflective teaching practice been affected?

The following issues were raised through the year of my action research project. They speak in part to the difficulties faced by a full time primary teacher attempting to adopt a critically reflective approach to self-improvement. While my action research project failed to meet original expectations the following comments are examples of critical self reflection on the opportunities for action research itself.

Issue - the difficulties that arise in trying to collaborate with other teachers due to other demands on time and effort.

In any one week, there are effectively about ten time slots that can be accessed for preparation or discussions. These are lunchtimes and after school. Most recess times are busy periods, used for preparation and organisation of school events, rarely for taking a break. Without wishing to labour the point, there seemed to be a never-ending list of administrative tasks required to be completed in my spare time. With yard duty taking two slots, and meetings taking three slots, there were effectively only a few time slots left for discussion with my colleague (JM) who was acting as my critical friend. Taking into account her timetable as well and the irregularities of scheduled events, and it was extremely difficult to meet on a regular basis, and then it was only for a few minutes at a time. JM, as prep teacher, was extremely busy. Apart from the prep children needing extra supervision at cating times, JM was heavily involved with the Integration Program. As the Integration Officer, she had to set up the time tables of our 8-9 integration aids (for our five integration children). If there were any problems, she needed to be available to sort things out. Particularly in the earlier parts of the year,
there were lots of teething problems as the way the integration program ran had to be altered due to lack of funds. This necessitated JM having to fill in at times when the Integration aids were away or over recess/lunch breaks if there weren't enough aids to cover the supervision of the children in the playground. In retrospect, our meeting time really should have been organised differently, perhaps by arranging to meet with her at the weekend, however I felt uncomfortable about imposing on her over the weekend. This is a relevant issue when related to the fact that I need to be able to reflect on what I've been teaching and how I could improve. Collaboration is essential to provide me with the feedback I need.

*Issue - lack of collaboration is a problem as I can't get the feedback I expected on these lessons.*

When I first proposed the idea of this action research project, I had anticipated having three colleagues to assist in the discussions and assessment of my science teaching. This didn't occur. Even from the start, one teacher lost interest and dropped out. Possibly she realised what level of commitment I was asking for and decided that she really couldn't commit to it. The second teacher was still strongly supportive but again circumstances at her school (timetables, workloads, other commitment) stopped her from being able to give a firm meeting time each week. Generally our meetings were short and procedural, relating to questionnaires or returning material rather than about science teaching. Often our meetings occurred with me following her around as she did yard duty, or in her classroom while she was preparing for the afternoon session. The third teacher was again strongly supportive, but because of the precarious nature of her integration role, was unable to commit to a specific time each week. We tended to snatch a few minutes in passing to discuss more the practicalities of the science session about to happen, or to discuss briefly what had happened at our last session. It was left up to me to record these observations in my daily journal to reflect on. However, the deeper, more meaningful, reflective discussions never took place. This was hugely disappointing. I really didn't know what to do about it. I realised early on that I wasn't receiving the feedback that allowed for an analysis of my teaching practice, but I kept hoping that the strain might ease. I had expected that JM's integration role might ease up and that when I finished the Early Years Literacy training that we might be able to
find time together. It just seemed that other things filled the gaps. In reviewing the situation, there always seemed to be a number of different barriers which prevented me from pursuing a fully collaborative, action research project. These barriers would be present at any school and in any situation where a teacher wanted to undertake critical self reflection. Simply stated they are: lack of time, imposition of other school priorities, inflexibility of school time tables, lack of interest generally, lack of commitment of other staff. Basically, they relate back to the over riding issues discussed in chapter seven of increased workload, changed power relations, changes in curriculum and teaching roles and changes in teachers’ morale.

**Issue - How does Constructivist Theory relate to my teaching practice?**

I did undertake my own reflection on the science which had occurred, but found that I did not know how to actually improve once I had identified a problem. I had read about constructivist principles and read different case studies, and applied what I could, but really struggled to dissect my science teaching practice further. This relates in part to the issue of not being able to find time to collaborate with the others involved. Had there been more time, maybe I would have been able to approach each lesson with a more strongly constructivist practice. Often, I couldn’t quite see how I could change my approach. It is interesting that, after finishing the whole year’s work, I am able to look back at the practical work and immediately see how I could have approached it differently. I am able to be reflective in hindsight. Probably my knowledge base has grown, but I also believe that the ‘pressures’ have been removed. The pressures I refer to are partially self imposed, partially down loaded. The time constraints, workload, other priorities are all examples of external pressures. The other pressures are the ones I could have done something about at the time, had I recognised what was happening. I was tied up to the idea of completing a set number of activities across the year. I imposed a strict timetable on myself and the lessons. Flexibility may have allowed more time for reflection.

**Issue - Communication between staff is poor, despite the fact that the school is small with low staff numbers.**
This lack of communication created problems by causing clashes. As other teachers organised whole school activities, they were faced with the task of trying to fit them in around the constraints of specialist time tables and specific classroom timetables. Sometimes events were organised which clashed with science and if communication was poor, as it so often was, then there was little time left to reorganise science. This occurred many times. Science was given low priority and often we had to rearrange the science time based on other school priorities. Had communication been better this may not have occurred.

This lack of communication meant that I could not discuss my concerns about science lessons with other teachers who may have been supportive (not all would have been, I would have had to be selective). Again, using others as sounding boards for ideas or for problem solving would have been a wonderful tool for my personal professional development in science.

**Issue - Time and effort required to organise the science sessions are greater than I expected.**

In terms of the organisational aspects of the buddy science program, gathering the equipment and other resources together were the hardest to manage. The room which housed the science equipment was in use on Monday and Tuesday for art, Tuesday after school we had a staff meeting, Wednesday lunchtime I was involved in a junior school meeting, Thursday recess and lunchtime I had yard duty. Generally, science was directly after lunch on Thursday, so I had to rely on Wednesday after school and the second part of Thursday’s lunch break to prepare things. Thursday after school, I cleaned things up and put them away. As I was dealing with such a large group of students, fifty-five in all, I needed a lot more equipment than usual or I would have to organise for two smaller activities which the students swapped between. This extra effort cut into the time available to do other things, like talk to others or meet with my critical colleague. Taken in isolation, it is just one small element of the whole experience, but when combined with the other constraints on the program became significant.
Issue - Morale of teachers is low due to continuing changes and pressure to adapt to changes.

As workload has increased, staff have become less amenable to other changes. The stress levels have increased, morale has plummeted (particularly in the years 1993-1996) and it has been difficult to establish harmonious working relationships. The group dynamics at my school have contributed to that as well. As discussed in chapter six, there was quite a strong clique of teachers in the school until early 1997, who seemed to be able to exert control over many of the school decisions. This group did not support the specialist programs as they had existed because they believed that the specialist teachers were given too much preparation time. Even today, with the disbandment of this group, individuals still feel resentment towards others they believe are carrying an easier load. This easier load can be defined as having more time off from direct face-to-face teaching, having fewer students, having an ‘easier’ group of students (e.g. no integration children, no students suffering from Attention Deficit Disorder), having a specialist load (less marking and assessment of students), having the best classroom and so it goes on. Petty jealousies created by low morale, high stress and increased workload can make the work environment uncomfortable at times and affect a teacher’s enthusiasm for teaching. I found it extremely difficult to discuss my ongoing research project, mainly because I knew that many of the teachers were just not interested and some would have been quite antagonistic. As there still seems to exist a rift between teachers and educational researchers in general, discussing my educational research would have placed me in the category of researcher, thus alienating me further from some of the staff, many who do not understand my need to extend my professional growth.

Issue - Obstacles which result in the postponement of the science program - other school commitments which must take priority.

I realised that during the undertaking of the action research project in 1998, there were many occasions when the science sessions had to be changed in some way. I decided to check through my records (diary and journal entries) to determine how frequently they were altered and why. The first date is the date that the activity was originally planned for. Changes are noted and explanations given if recorded in the Journal at the time.
19/2 - changed to 20/2 - double booked with PE.
5/3 - changed to 6/3 - preps not able, teacher involved in meeting.
19/3 - changed to 1/4 - Early Years Literacy given priority, swimming program running.
2/4 - not taken, ran out of time term 1
30/4 - unchanged
14/5 - changed to planting to fit in with Arbor week.
28/5 - changed to 4/6 - education week - whole school special activity scheduled during science time.
11/6 - unchanged session, although we are still one topic behind.
25/6 - Early Years Literacy on Thursday, JM testing her preps for school reports. No time.
16/7 - extra session fitted in to complete last term’s topics
23/7 - unchanged although still one topic behind.
6/8 - unchanged, two science lessons combined into one.
20/8 - no science, preps too busy
3/9 - unchanged, back on schedule.
17/9 - no time, second last day of term.

At this point, the rest of the science program had to be changed due to the Animals theme taken up by the junior school. JM felt that to continue with the Life and Living theme as well as the Animals theme would be too much for the preps.

15/10 - changed to Friday, Thursday difficult for preps.
29/10 - changed to following week, to keep the two week rotation going.
12/11 - changed to following week
26/11 - no science. Student teacher given priority on time.
10/12 - changed to 15/12

On reviewing the timetable for science, I was appalled. There were only five sessions out of the original twenty which were not rescheduled for some reason or other. I was amazed to see the range of ‘other’ priorities which either required that the science be rescheduled or in some cases abandoned. I thought that I had done a good job of
keeping science a top priority for the buddy program, but on reviewing the data, it seems that other things have impinged on the science program.

**Issue - Pressure to take on other ‘science’ activities as I am recognised as the science enthusiast at school.**

I really enjoy taking science and have always been glad to advance the standing of science with my colleagues and students. Whenever the opportunity arises, I will take on ‘extra’ if it means that science is being brought to the forefront of people’s thoughts. Over the year of the buddy science program, I was also involved in providing an Extension Science Program in term three to students from grades 2-5, and in delivering an ‘Anatomy Unit’ to the grade 5/6 in term four. The Anatomy Unit has become ‘tradition’ in the school and every grade six group expects to ‘do dissections’ in their final year at primary school. Although I really enjoy taking on these extra science activities, they do require more preparation and time, adding yet another pressure to my already crowded day. Again, this was only one other infringement on my time, but quite a significant one. I probably lost between 1-2 hours per week in organisation for these extra science activities. However, they added so much pleasure to my teaching.

**Issue - Constant awareness of ‘standards’ required in reporting and in assessing what students know.**

Children have to be assessed using the Science CSF standards. It is a constant dilemma when dealing with such a large group and in a one-off lesson to be able to gauge each student’s understanding of all concepts introduced in the lesson. In fact, it is impossible. However, the best that we can do is to question as many children as possible throughout the entire practical session in an attempt to arrive at some knowledge of the child’s learning. Recorded responses might help, but with this age group, they are not always very practical.

While working with this buddy group, each teacher was responsible for keeping records of the children in her own grade. I don’t believe this was done very well. For myself, I would use a checklist for the children that I was sure understood, or did not understand,
a particular concept and the rest of the children would have to be observed on other occasions.

For some lessons, I undertook targeted assessment, where I questioned specific children. This worked well but meant that my focus was not always on what all the students were doing, but only what a select group were achieving. This created problems when others wanted or needed attention. Sometimes the targeted assessment was not achieved due to the needs of the larger group. This need to concentrate on accountability while running lessons meant that there was less time to appraise the lesson in situ particularly with regard to assessing whether I was proceeding according to constructivist principles. It required constant awareness of things like allowing children to ask questions, giving them the opportunities to develop their own answers to questions they may have, and being vigilant to allow for the cognitive development of the child.

*Issue - Classroom management dependent on students with behavioural problems (social and medical) and Integration student.*

Several of the children in the grade two component of the buddy science program were quite immature. As well, within this group there was a child who displayed all the behavioural characteristics of Attention Deficit Hyperactivity Disorder (ADHD). He was unable to concentrate, very distractible, and difficult to manage in a group situation. In the larger group we had two integration children, one of whom was in a wheelchair. The inclusion of these children added another dimension to the group dynamics. There was no such thing as 'normal' behaviour. Children had to be monitored very closely to keep them on task. Fortunately, the two integrated children had Integration Aids who were able to modify tasks if needed and involve other children in the learning experience. Management skills and high levels of organisation were needed to keep the others focused on their activity. Part way through the year, the suspected ADHD child was diagnosed as having this disorder and placed on medication. There was an immediate improvement in his behaviour and subsequent alteration of the class dynamics. In terms of my ability to reflect on what was occurring in the classroom, this rates similarly to the situation concerning assessment. Having to concentrate on
classroom management to keep students on task detracts from the ongoing assessment of the actual learning taking place and how any teaching strategies may be working.

*Issue - Budgetary constraints have meant the loss of our 'once a term' planning time which I found invaluable for theme development and collegiate planning.*

Over the years of staff cuts and budget cuts, different principals have approached the idea of team planning time in different ways. One principal organised the supervision of all the children from the grades involved, with the help of the specialist staff. This meant that he and the other specialist teachers had a heavier load for half a day, but gave the unit teams time to plan. The next principal, also believing in the planning time, organised for the children from those grades involved to be split up amongst the remaining teachers. Often this meant an extra ten children in a classroom for half a day. In 1996 when this occurred, I ended up with forty-six children for half a day across the grade levels 3-6. Still, to gain the same benefit, I was happy to cooperate. One principal who was only with us for a term in an acting capacity, organised for casual replacement teachers (CRTs) to replace the staff for half a day each. This did not increase the burden on any member of staff. He felt that the money was wisely spent. Finally our current principal tried to split the grades as before, but the junior school numbers were becoming too large. After trying this a few times, it was abandoned and teachers lost out on release for planning time for the rest of the year and into the next. Planning was undertaken during weekly lunchtime meetings, on an ongoing basis. Several of the staff complained about the necessity for this and after review, planning time has been reorganised by providing CRT cover in the grades. This is by far the most satisfactory way of doing it from my point of view. Before the reduction in the number of pupil free days allowed to schools (schools went from 8 to 4 a year), the entire staff would spend a day together each term planning the next term's work. Half the day was spent, with the specialist staff, gathering resources and discussing the themes, the other half of the day was spent in unit teams organising the specific planning for that particular unit. For efficient teaching and learning, it is essential that teachers have access to planning time. In terms of the buddy science program, it would have been useful to have discussed this
with the broader junior school team and to have gained the support of other teachers in the area.

8.8 CONCLUDING COMMENTS

Taking into account the issue of workload, it has been incredibly difficult to maintain any energy for curriculum initiatives outside the requirements of the DoE. Each new change imposed by the DoE has required large amounts of time, reflection and energy to implement. It has not been a simple task of the introduction of one new idea with the resultant attitude of 'Let's try it'. Rather it has been a constant string of comprehensive, complex, even grandiose conceptions, introduced without thought of the impact on teachers' workload. Each new idea requires whole school consultation, planning for implementation, individual strategies and finally the practicalities of implementation. The CSF, in particular, probably took at least three years for teachers to become familiar with all aspects of the document and its subsequent use in planning and assessing of curriculum. School strategies for integrated curriculum had to be reviewed and revised, assessment and reports had to be revised, individual classroom programs had to be audited against the CSF. I would confidently say that there are still teachers who do not fully use the CSF and do not intend to.

The altered power relations have had some impact at my school. With the disbandment of the 'clique' mentioned earlier, there has been a reshuffling of the hierarchies within the school. New staff have contributed to the complexities of the situation with the two most senior positions in the school being filled from the external school community. In that reshuffle, the new principal shifted staff around and appointed others. People in acting higher duties positions lost them to new staff which caused some resentment. For several years, school was not a pleasant place to be. The manner in which the newer members of staff affect change has also been criticised. Despite the rhetoric of team building and collaborative decision making, the reality has been the establishment of an hierarchical order of individuals who appear to be a strong collegiate group, but in fact are far from this.
Morale within the school was discussed within section 8.7. It has caused a great deal of discomfort and unhappiness at our school over the years and has directly impacted on the science program offered by the school and on my science teaching in particular. I have not felt at ease with many of the staff. This has caused me to back away from the issues surrounding my science teaching practice and from that of others. It would have been wonderful if the staff as a whole had embraced the idea of science education and planned for its improvement at the classroom level.

Now, to answer the question raised at the start of this chapter.

How do primary teachers develop and teach a quality science program in light of the structural and policy changes occurring in education in Victoria?

In the current situation of workload, power structures, curriculum and morale issues, I think it would be almost impossible to teach a quality science program. Some teachers do, but they ignore or can isolate themselves from one or more of the issues above. I do know of some teachers who would consider that they teach a quality science program. However, one of those teachers, Roxanne, ignores the Science CSF and continues to teach science in the manner she has done for years. The others have considerable support from their principal and other staff. Their enthusiasm for science has led to the recognition of science as being an important curriculum area within their school.

Of course the term 'quality' is problematic as well. Roxanne, for example, believes quality comes in when you address the students’ concerns and queries in science. Her science lessons are led by students’ interests. However, she admits that she does not take science in areas that she doesn’t understand, such as electricity or forces. Does she teach a quality science program?

Others I know have adjusted to the Science CSF, and addressed the accountability requirements within the CSF. Because they do this and have trained in recent DoE science initiatives; do they teach a quality science program?
When I started this thesis, I wanted to improve my science teaching practice. I armed myself with an understanding of recent research findings on how students learn science and how this can improve students’ understandings. I developed a program and enlisted help. I approached the project with enthusiasm. At the time of undertaking the program, too many things acted against the development of my science teaching practice. Particularly the issues raised in this thesis acted to reduce the time available for collaborative and reflective analysis of my teaching practice.

I query how any teacher without significant additional support could teach a quality science program in light of the structural and policy changes that occurred in education in Victoria in the Kennett years of state government.
CHAPTER NINE

OUTCOMES OF THE RESEARCH AND THEIR CONTEMPORARY SIGNIFICANCE

This final chapter is divided into three main sections and draws together the perspectives and establishes the relevance of the research reported in the preceding eight chapters. The first section reviews the role of the teacher as researcher over the period of the thesis study. It discusses the changing nature of the research work and concludes by defining the focus of the thesis in its final chapters. The second section describes what happened as the research proceeded and summarises the results of each of the chapters. The main outcomes of the research are placed within the context of the 'Kennett era' of state government. The third section focuses on the contemporary significance of these outcomes. It re-examines the current educational scene, particularly in terms of science education. Finally, it sets out a number of considerations grounded in the outcomes of this thesis.

9.1 REVIEWING THE RESEARCHER'S STORY

At the commencement of my study in 1993, I had intended to undertake a short action research project on my science teaching practice. As documented in Chapter Four, after a personal struggle coming to terms with alternative research methods, I presented an argument for using action research within a case study - because of the 'harmony' and compatibility of the methodologies with my research requirements. I had every intention of using a case study methodology to set the scene within my school whilst using action research to study my science teaching practice therein. The organisational aspects of the research were set up. I approached the District Liaison Principal of my district to gain official approval and I attended a district principals' meeting to engender support. Subsequently, I approached several schools on a personal basis to ask for the support of the principal before approaching staff. Having gained the support of one school principal, I approached several of the staff he recommended to ascertain if they were interested in assisting me. After further discussions, I obtained the support of two
teachers from that school. At my own school, it was much more difficult to gain support. Firstly, from a logistical point of view, there was no way that other teachers could actually be involved in participating in or watching my classroom practice. Secondly, as mentioned in Chapter Five, there were certain elements working against me within the school. Eventually, one teacher agreed to be available to discuss my sessions with me.

Owing to an unprecedented set of events associated with the introduction of changes in policy and structure within the Victorian education system, my study became entangled within the greater demands placed on my time and energy. At this time, I was still trying to work within the parameters I had set up for the action research. Despite every effort on my part, I felt that circumstances had moved out of my control. During this time of restructuring, I continued to document the changes that I was seeing and experiencing first hand. I was still not really aware of the importance of this documentation, I was completing a journal to fill in the ‘gaps’ later. Finally, realising that I was not making much forward progress with my studies, I attempted to set aside a year for the action research project. Again, I approached the collaborating teachers and gained their support. However, despite assurances, none was able to give the time, effort and energy required to complete the action research successfully. At this time, I thought that I would have to abandon my studies. I certainly did not have the data to indicate an improvement in my science teaching practice. As I tried to think further, other ideas were generated. Perhaps I could run a short three months action research project? Perhaps I had been too ambitious at the start?

With the passing of time, I started to see that in fact my study had changed. My study became a critical account of the impact of change on the lives and teaching practices of teachers in the Victorian education system. When I gained study leave and was actually physically removed from the demands of teaching, I found that I was able to critically reflect on those changes and their effects on my ability to undertake critical self reflection of my teaching practice. My action research had broadened from studying my science education teaching practice to studying the constraints on reflective teaching
practice. My case study of the school context had grown to encompass the structural and policy changes in Victorian State education.

9.2 OUTCOMES OF THE RESEARCH

9.2.1 The Thesis Outlined

The earliest chapters of this thesis set the scene. The changing state of education at the international, national and state levels was clarified in terms of the political nature of educational policy and structure. The changes over the last seven years have not been based on sound educational philosophy but rather on the fiscal management of the school system. This was plainly demonstrated in these first few chapters. In particular, the complexity and rapidity of change in the Victorian state education system was clearly highlighted. The umbrella term for the introduction of these changes was that of 'Schools of the Future' and these chapters touched on the implications of these changes for the practising teacher. A number of issues and research questions were raised through the documentation and discussion of these changes.

Chapter Three dealt with the exploration of science education - its historical context and some of the philosophies behind certain teaching approaches. Recent research into constructivism was investigated and explained. This was necessary to give the reader some understanding of the area in which I intended to undertake my research.

From there, the thesis moved onto a discussion about my journey as a researcher from my background beliefs in empiricism to an acceptance of interpretive research. After this, the thesis outlined the justification for choosing the two methodological forms of action research and case study. The action research project was to be a collaborative, critical investigation of my science teaching practice. The case study of my school environment was to provide a comprehensive account of the context of the research. A short description of the data collection methods used in the research project was then given.
To set the context of the research, I have given a short descriptive account of my base school, its staff and the power structures operating within the school over the course of the last six to seven years. A nearby primary school was also investigated as a comparison and cross check on the influences of change on teaching practice. This chapter revealed that other schools were experiencing similar problems of staff workload, innovation overload and general tiredness with the expectations of the educational system. Several teachers' stories were told to highlight the way perspective can be altered by the personal situation of the individual. In particular, the newer teachers, the graduates, are unwilling to condemn any of the new initiatives. This is in part due to the fact that they are just so pleased to be employed at all but also because they know no other system.

Chapter Six gave a narrative account of my teaching background over the last ten years and in particular, the direct effect of the educational policy and structural changes to my science teaching practice until the start of the research project. It is a subjective account which highlights some of the constraints felt by teachers in the climate of change of the last seven years. This chapter then moved onto a weekly description of the buddy science research project - its successes, its failures, children's responses, critical comments from colleagues and factors which influenced the way the science sessions were run. Issues which arose through the conduct of the action research were then identified to be further investigated in chapter eight.

It was at the conclusion of the action research project, and after attempting to write about the improvement in my science teaching practice, that I started to construct an alternative view about the significance of my thesis. Chapter Seven takes up the challenge of trying to convince the reader of the breadth, depth and complexity of the changes that have occurred in Victorian state education over the last seven years, through the years of the Kennett state government. These structural and policy changes, linked back to the earlier chapters of the thesis, are of critical importance to the development of teaching practice. Throughout this chapter, examples and arguments are presented from the international, national and local scenes which support the contention that these changes have impacted significantly on a teacher's ability to be critically self
reflective. In reality, very little teaching improvement can come about unless it is sanctioned and supported through the DoE. This is a significant and crucial finding and one which is further discussed in the last chapter.

Chapter Eight deals with the specific issues for science teaching in an attempt to answer the question of whether primary school teachers can develop and teach a quality science program in the climate of change in existence in schools. How have the structural changes impacted on science education? It appears that science education is an area of difficulty for many teachers. Those who are enthusiastic about science will continue to teach science in the manner they have done for years. Those with less enthusiasm find that, given all the other pressures (as mentioned in Chapter Seven), there is insufficient time to physically and mentally gear-up to take science. Like other curriculum areas which require specialised knowledge, teachers need to study what they are about to teach. Chapter Eight indicates that: currently contemporary educational theory plays no part in teachers’ understandings of science; that science has not been a priority curriculum area for teachers for many years; that professional development is only now taking into consideration the needs of primary teachers of science; and that much more of everything (time, resources, professional development) is needed for science education to improve at the classroom level. Within this chapter, specific issues related to my school situation and science teaching were also addressed. While these cannot necessarily be extrapolated to the wider school community, it is reasonable to expect that many of these issues would exist in other schools.

9.2.2 Critical Self Reflection

There seems to be little legitimate space in school for reflection about practice.

(Holden, 1995, p149)

Recently, a colleague at Deakin University asked me the question, ‘Is critical self-reflection even possible at primary schools?’ She was aware of the research I had been undertaking and enlarged her question to include the importance of the specific context of the school and individual interest groups within my school. My response was that I thought it was, if teachers were given adequate support in school. A person
working in isolation, or even in collaboration, would find it difficult to be critically self-reflective given the amount of time and energy needed to just maintain a teacher's role. Several factors influence the ability of a teacher to study her own practice from a critical viewpoint. These include: the teacher's own enthusiasm, personality and abilities; the context of the school and staff, or how much internal support is offered; and the externally imposed factors such as structural and policy changes which affect workload and morale. All of these factors are critical and I believe that if any two are working in contradiction of the teacher's practice, then self reflection is impossible.

Earlier in this thesis, I made comments about different factions within my school who appeared to actively work against the reintroduction of science as an important curriculum area and, consequently, against me as the instigator of this change. With no direct support, and even open hostility at times, it was impossible, for a long while, to ask for collegiate support for undertaking self reflection on my science teaching practice. While other teachers may not experience this same hostility, support in terms of time or collegiate discussions is essential for the critical element of self reflection. However, as I found out when undertaking my own research, not all collaboration leads to further understanding or improvement in teaching:

> Does teachers' time together advance the understanding and imagination they bring to their work, or do teachers merely confirm one another in present practice?
> (Little, 1990, p22 in Fullan, 1992, p105)

I believe that this happens sometimes, but if teachers are meeting to try to change practice, then I believe a different process occurs, a much more structured and formal analysis of practice.

There are certainly examples of school situations where teachers are given time to be together, for planning and discussion of educational issues. One school in the Geelong region has time-tabled all its teaching staff to be available for two hours each week to meet in unit groups. The time is used to discuss the technical arrangements of their teaching, not reflection or the theory and practice of teaching. However, if one school
can manage its resources like this, then so can others. At this point it relates to the school’s priorities and leadership. I have heard of other schools which allow ‘planning time’ for teachers on a term basis. How much more beneficial to the school would it be if ‘critical self-reflection’ became part of the school’s normal practice?

In Queensland, Pullenvale Environmental Education Centre works in conjunction with local teachers, offering them a professional development workshop in which they learn the elements of action research. Together, staff and individual teachers work on a joint project which can be undertaken at the teacher’s school as ‘an ongoing curriculum project’ (Andrew, J. & Robottom, I. 1995, Case Study 4, p5). This is another method of support which can be offered to a teacher wanting to improve her teaching practice through action research or critical self-reflection.

9.2.3 The Kennett Era

On closer examination, I can see that the broader issues of workload, teacher stress, professional development and changed power relations are the defining factors within which all others are located. The Kennett era of state government saw an incredible number of changes introduced into the Victorian education system. These changes were in the nature of policy and structural alterations of significant proportion. A different philosophical approach to education became more obvious as education was viewed in terms of economic viability and economic responsibility. Schools had to operate within specified budgets and be able to quantify their spending. Schools became more responsible to the consumer market, wherein parents and children were considered to be customers or clients. Accountability measures were taken up in all aspects of schooling and with this, a huge increase in teachers’ work, both at the classroom level and administratively. The structural and policy changes had deep and far-reaching effects on teacher workload, teacher morale, power structures within school and on professional development opportunities. This last factor relates specifically to this thesis and the difficulties faced by teachers who try to undertake critical self reflection. In a sense, the Kennett era contributed directly to diminished opportunities for teachers to reflect on their own practice and consequently, to improve their practice.
9.2.4 Limitations of this Research

Earlier in this thesis, Ch 4.3.2, I acknowledged that I would not be generalising from my case study to another. Because each case study is unique, seated in a dynamic social situation, it is difficult to draw parallels from one to another. However, McTaggart (1987, p8) writes about the establishment of ‘domains of generalisation of phenomena’, wherein generalisations can be made between similar circumstances. Obviously, there was a unique set of conditions at my school and a unique interplay between members of the staff. These things cannot be extrapolated into a different field of study, into another school setting. However, I believe that the conditions that I experienced as a teacher with the change of structure and policy within the Victorian education system, were similarly experienced by the greater proportion of teachers in the State. How each individual reacted to the changes remains unstudied, however how the general population of teachers reacted and was reacted upon is reflected in the literature cited in chapter seven. I believe that there was enough evidence supplied to support the contention that generally speaking, all teachers are suffering from overwork, innovative overload, stress and reduced capacity to cope. Other researchers have commented on how other countries which have introduced outcomes based education within a self managing school system have experienced similar findings (McWilliam, 1994).

9.3 CONTEMPORARY SIGNIFICANCE OF THESE OUTCOMES

9.3.1 What is the contemporary significance of these outcomes?

To answer this question, a broad brushstroke description of the contemporary scene of education needs to be given first. This everyday scene of education is one where teachers continue to operate within a structure imposed by the state government within the Kennett era (and this thesis articulates the pressures/difficulties associated with this for teachers interested in adopting a research perspective on their practice!) Over the last two years, the DoE have introduced a significant initiative in the ‘Science in Schools – SET for Success’ project. This project is based on the Science Engineering Technology strategy (Science Engineering Technology Strategy, 1998, DoE publication) and initially involves five separate components:
• School-Community Partnerships;
• Professional standards for science teaching;
• Professional Development;
• Research Projects; and
• Development of Support Material.

(extracted from Science in Schools booklet, November 1998, DoE publication)

In addition to this, from mid 1999 there were a number of newly funded projects which included:

• Leading practice centres - $3.6 million over three years;
• Science equipment for primary schools - $3.2 over two-three years;
• Partnerships with tertiary institutions, business and industry - $0.5 million;
• Major science research project undertaken by tertiary institution - $1.3 million;
• Science Professional Development - $2 million;
• Science grants to schools - $1 million; and
• Promoting science in the community - $0.3 million.

(Science in Schools, New Projects for 1999 Information booklet, 1999)

This huge commitment to Science in Schools - SET for Success places further demands on teachers. My experience and the documented evidence in this thesis indicate that for Science in Schools - SET for Success to succeed, there needs to be a recognition of the constraints and institutional/systemic demands being experienced by teachers.

Apart from the investment of teachers in terms of time and energy, the Victorian government is committing large amounts of money to science education via Science in Schools - SET for Success. It is important that this monetary commitment is informed by recent research, and perhaps more importantly, that practising teachers will have the opportunity to respond to these science education initiatives (SET) and adapt a reflective perspective themselves as they do so.

This thesis has shown that recent policy and structural changes have diminished the opportunity for this to occur. It is clear that in the Science in Schools - SET for Success environment, the constraints need to be addressed so that effective teacher professional
development can occur and so that, in the longer term, our students benefit from having teachers who are well informed about science education practices. The significance of this thesis lies in the fact that it has documented the changes to the Victorian education system and their impact on teaching practice. This thesis has the potential to inform the DoE of the constraints under which teachers work. Similarly, in my role as a practising primary teacher of science, I can bridge the gap between research and schools by articulating my findings through presentations at staff inservices, DoE conferences, or other forums of educational debate. Armed with this knowledge, the DoE have it within their power to adjust the pressures felt by teachers and, as a consequence, enhance the probability of successful implementation of *Science in Schools - SET for Success*.

### 9.3.2 Proposed Recommendations

In light of the information documented in this thesis, I propose a number of ideas for consideration.

At the simplest level, much more money has to be injected into all aspects of the education system to relieve the constraints under which teachers currently work. Ways of achieving this relief would be:

- The provision of monetary support for the employment of more staff (administrative, support and teaching) which would immediately reduce the individual teacher's workload;
- The provision of monetary support for more teacher release time so that teachers are able to attend professional development sessions, thereby encouraging teachers to make a commitment to their own professional growth; or
- The reinstatement of four pupil-free days targeted for professional development;
- The restructuring of professional development opportunities to engage teachers in their own research. Stronger links should be forged with agencies such as universities, TAFE colleges and science centres so that collaborative science research projects, related to the school's needs, could be fully supported. The Pullenvale Environmental Education Centre is one such example. Paid study leave should also be reinstated;
- The physical and monetary support of networks, classroom projects, school innovations and other collaborative enterprises would enable a
broader approach to educational change and one more in line with teacher satisfaction and critical self reflection;
- Further simplification of the CSF, with less emphasis on the outcome statements would reduce the amount of extraneous assessment currently undertaken;
- Improving the public image of teachers and science by positive publicity. The value of teaching needs to be promoted as does the image of science;
- Taking a long term view of reform, not a short term view of change, so that implementation strategies have the benefit of time.

9.3.3 Future Areas of Investigation

As with any in-depth study, questions are always raised about where the research is leading, or has led, the researcher. I find myself asking questions and posing a few problems. The most obvious is: given the implementation of the recommended changes, how can we effectively measure if there has been a change in state for teachers in the Victorian education system? Is another case study the answer or would another form of research yield a more definitive answer? Problems arise. With the expected exodus of older teachers from the teaching service in the next few years, would a longitudinal study of teachers' working conditions yield the same ability to articulate the 'before and now' of the situation (with the advent of many new teachers who haven't experienced 'the Kennett era').

Another extension of this thesis could investigate how the current Victorian educational situation compares with other outcomes based educational systems of other countries. Much of this information has been collected by researchers in the international field, but a comparative analysis might indicate some interesting similarities or differences.

Ultimately, the educational system is in place for the benefit of students. How has outcomes based education affected the achievement results of students? How is this success measured? As the Victorian educational system changes to ease the workload of teachers, how are students affected? All of these questions come to mind as I pursue the significance and outcomes of this thesis.
Finally, I am still an enthusiastic teacher of science and still wish to pursue an active investigation of my science teaching practice. With the issues of workload, morale, curriculum, and power relations taking on a less significant impact in teachers' lives, I would like to attempt a critical self-evaluation of my own teaching practice once again. At this stage, I believe the context of my school would still not be supportive of this venture, so I need to wait until I can change this. With my role as Regional Professional Development Coordinator and subsequent involvement with other teachers and schools, there may be other avenues to pursue this as a collaborative project of some sort.

9.3.4 Concluding Comments

In brief, this chapter has reviewed my journey as a researcher and what my priorities were as I engaged in the research. The fact that changes occurred to the practical application of my study and why those changes happened has been explained. The outcomes of the research were then explicated with reference to the thesis document itself, critical self-reflection, the Kennett era of state government and the limitations of this thesis. The significance of the study is two fold. Firstly, the thesis has highlighted and documented the impact of change and subsequent teachers' struggles to come to terms with the Kennett government policy and structural changes. Secondly, with the current DoE initiative into science education, the constraints experienced by teachers need to be addressed if genuine change to the implementation of science education is to occur.

A number of recommendations were generated which, if implemented, would ease the excessive workload burden of teachers and allow for further development of teachers' professional lives. Finally, the thesis indicated possible future directions of research or areas of interest generated by unanswered questions raised by the research.
APPENDIX

COLLECTION OF SCIENCE EXPERIMENTS UNDERTAKEN AS PART OF THE ACTION RESEARCH PROJECT

1. Buddy Science Practical - Collections 20/2/98

Aim
To have children collect things from the school environment and to group them according to some recognisable quality.

Method
1. Discuss with children the word ‘environment’. Ask if anyone knows what it means and allow them to give examples. When sure that all students know what this means, discuss task and set them to it. Emphasise the need to collect four different things each. They will work in teams of four or five (two teamed buddies).
2. Walk around the school grounds discussing with individual groups what they have collected. Allow enough time for all groups to find enough things (fifteen minutes).
3. Return to library and talk to children about grouping, giving them examples but ensuring that they are given full reign to explore their own categories. Allow ten minutes for grouping to be achieved. Children circle their groups and label them (emphasise that correct spelling is not a problem otherwise some will worry more about that than the task at hand).
4. While students are grouping, J,..., parent & I talk to children, asking them to explain their groups.
5. Sharing time. Ask children to explain their groups to the other children.

Results
I felt that this went very well with the students understanding the issue of environment at the simple level of 'the things around us'. They gave examples which included the natural environment, plants trees, air, birds etc. and the human-made environment, buildings, rubbish, playground equipment and many others. They collected many different things and were able to group them according to colour (brown, green), origin (tree, plant), position (above the ground) and attributes such as soft/hard. Some students showed an ability to use two categories for grouping (colour and hardness)
2. **Buddy Science Practical - Noting changes to natural things** 6/03/98

**Aim** - to introduce children to the changes that occur in natural things, some caused by humans, others by nature.

**Method**
1. Discussed last week's groupings, just to reinforce. Asked children to describe how some things changed. They needed some examples to understand what the question meant. After this most were able to give some examples.
2. Showed them a leaf and asked them to describe the changes they could see. We discussed how the changes occurred. What had caused them?
3. In buddies, students were given a leaf, and had to write an account of the changes they could see, and asked to explain them.
4. Given twenty minutes to complete the task, while teachers circulated to discuss students work with them. Some students explained, most didn't.
5. A selection of the students' work was presented at the Junior School assembly, with students reporting on their results.

**Results & Comments**
Students were able to accurately locate most of the changes, but only about 30% offered explanations. Maybe this would have been better had we had the time to collect the leaves ourselves, so that students had some say or 'ownership' over what they described. Time is somewhat restricting. Am I attempting to cover too much? I don't think so.


**Aim** - to give children an understanding that under certain circumstances, some materials can change state.

**Method**
1. Four stations were set up: melting ice, burning candle, popping corn and dissolving sugar. I had two teachers, one student teacher and one parent in charge of the activities. Each was supplied with notes and instructions prior to the day's activities.
2. Children were placed into four groups of eleven and colour coded to assist them in staying together.
3. The rotational procedure was explained to the children and they were sent to their first task. They were asked to predict what they thought might happen before they started each activity. They were given 10 minutes at each activity, and that included recording time.
4. Students returned to central point for sharing and discussion.
5. In addition, we had a butter churn as a demonstration activity, with all students having a turn to churn the butter. This was followed up on the Monday with students tasting the butter they had made.

**Results**
Students were able to discuss the changes they had seen and relate them to changes of state.
4. **Buddy Science Practical - Electricity 30/04/98 & 7/05/98**

**Aim** - to further develop children's understandings of electrical plugs and circuitry. To help them recognise that electrical items can be powered through a plug and plug board or through batteries.

**Method**
1. Show children a tape player and pretend to try to play a tape. When it doesn't work, ask why.
2. Discuss further the concept of electricity being supplied to buildings through wires and into plugs which can be accessed using cords and plugs.
3. Briefly touch on battery power for some electrical items.
4. Explain the task - to select electrical items from magazines and paste onto a large sheet. Allow students the freedom to group or categorise in whatever way they like, although encouraging them to think of groupings.
5. After second week of this task, the pages are stapled into a book, which the two grades go through with each group commenting on their arrangements.
6. At Junior School assembly, children present their work and positive criticism is given to each group on ways that they can improve their presentation.

**Results**
The students completed the tasks in a satisfactory manner, although some children do not have a knowledge of what is actually powered by electricity. Because a car has a battery, they included that as a thing that runs with electricity. They are not wrong, merely not accurate.

5. **Buddy Science Practical - Planting Pansies 14/05/98**

This is Arbor week and June wants to do some planting with the children. We still did it as a buddy activity, but she organised it. She was somewhat hassled by the whole activity and understands the constraints of such a large group with heavily practical tasks.
6. **Buddy Science Practical - Battery power 4/06/98**

Entering Behaviour - Children come to school with a variety of knowledge and experience with electrical things. From the previous practical session on electricity, it is obvious that the majority of these children have not experienced basic circuit electricity.

**Aim** - to give students the opportunity to discover circuit electricity.

**Method**

1. discuss the purpose of batteries, wire and globes with the students.
2. allow students to investigate to see if they can make the globe light up.
3. they can draw their circuit if they can get the globe to light up.
4. allow students to share their results at Junior School Assembly.

**Results**

Students were fully involved in this practical task. They worked well in pairs and teams and most solved the problem without too much intervention. Some solved the problem in five minutes, some in twenty. All drew their diagram of the circuit reasonably accurately and were able to describe how they got the globe to work. Some students wanted to experiment and this was allowed if they described what they wanted to do. One student persisted with short-circuiting things even after being asked not to. One group had a six volt globe which they thought was faulty because it didn't light up properly, so were given two batteries to see if they could change this.

Aim - to allow students directed free play with magnets so that they gain an understanding of the properties of magnets.

Method
1. Start off by telling the story of Magnetic Island and the sailors whose metal implements were affected by the magnetism of the island.
2. Discuss with students what things they knew were magnetic, and gave a few other examples (particularly computer disks and electronic equipment). Ask students to describe commercial magnets to arrive at the conclusion that there were two different ends. Ask them to describe what might happen as we put the ends together. Use students to test n-n and n-s together.
3. Give students a magnet between them and asked them to find out what it stuck to in the room.
4. Bring students back together to describe what they found out.
5. Describe next task - students to determine magnet strength by seeing how many paper clips their magnet will hold end to end.
6. Bring students back together to discuss results

Results
The students were enthusiastic about their tasks. Some of them discovered that the magnets didn't stick to gold (in rings) or silver (in earrings). They were able to discuss that magnets stuck to most metal things and were surprised to discover that some things were in fact metal (the heater looks like wood!)
In the second part, the students were able to compare magnetic strength by comparing the number of paper clips stuck to the magnets.
No recording was asked of the students this week. One, to give them a break from it, but also to allow more time for group discussion and activity.
8. **Buddy Science Practical - Light 16/07/98**

**Aim**
To further develop students understanding of light by giving them the opportunity to discover certain things for themselves.

**Method**
1. Children were involved in a discussion about light. Lead questions were - What do you know about light? Where does light come from? Discussion was led away from the obvious surface observations in an attempt to get children to think more deeply.

2. Demonstration of shadow using torch and spoon. Getting to the idea that light travels in straight lines.

3. Several tasks were explained to students.
   a) using a spoon, look at their images on both sides of the spoon. This was also demonstrated after asking for predictions.
   b) using a mirror, students had to see what happens to their pupils when light enters suddenly. This can be better demonstrated sometimes by just using partners.
   c) using a pencil to produce a shadow, student had to see if they could bend the shadow. Clue given: look for a corner.
   d) Using a mirror, students had to produce a reflection of the sun and make it move across their partner’s body.

4. Final demonstration, concentrating the sun’s rays through a magnifying glass to make paper burn.

5. No recording done.

6. Discussion focused on ‘What did you learn today?’

**Results**
Students were very interested in all aspects.

Aim
To develop students understanding of sound through experience and discussion

Method
In initial discussion, I used a number of demonstrations to illustrate various aspects of sound. I involved the students in the demonstrations as much as possible
a) using a tuning fork to demonstrate that sound is created by vibrations.
b) using vocal chords so children can feel their own vibrations. Using whispers to demonstrate absence of sound and vibrations.
c) using a straw to produce sound.
d) to illustrate sound waves traveling along, children were set up as a bumper line to show how particles in the air bump into each other to carry sound.

Children's experiments
Children were asked to try several things; the tuning fork, the straw,

Result
The children really enjoyed their experiences and were able to generate sound using a straw.

Aim
To discuss elements of the weather and have children observe the weather for one week to make them more observant of the weather.

Method
1. Discussed the weather and names given to different elements such as temperature, rain, hail etc.
2. Went for a short walk outside and children observed cloud cover, wind, temperature and other features.
3. Came back inside and completed their weather chart for the Thursday. Weather chart to be ongoing for one week.

Results
I forgot to give out the weather chart for the second part of the week. Had to leave it for another week before completing. I haven't asked June either, whether her students did the follow-up as well.


Aim
To teach children about day and night. To introduce them to the concepts of the Earth's rotational movement (24 hours).

Method
1. Using a book on nocturnal animals the topic of night and day was introduced.
2. Using a globe, and balls to represent the sun and the moon, the children were shown the placement of each to represent day and night.
3. Then using a light source, we were able to demonstrate how the Earth was lit during day and how the other side was in dark.
4. Discussion revolved around other information the students offered about eclipses and the revolution of the Earth around the sun to bring about the changes in seasons.
5. Children were asked to produce a day or a night scene using common things and animals appropriate to their theme.

Results
Students participated actively in the discussions and raised some interesting information themselves.
12. Buddy Science Practical - Colours 16/10/98

**Aim** - to children an understanding that colour is related to light, and improve their knowledge about how colour mixes are created.

**Method**
1. Discuss how we can see in daylight but not at night. Try to emphasise the point that colours can only be seen if there is light. Relate to their experiences at night.
2. Talk about how light is broken up into the rainbow colours, allow children to participate at whatever level they can. eg can they name the colours of the rainbow in order
3. Discuss how colours can mix and use cellophane to demonstrate some basic mixtures (prime colours).
4. Demonstrate colour mixes using paint (June did this)
5. Set children to task, creating their own colour mixes with pencils and crayons. Advise against using textas, but allow it for some children.
6. Discuss results.

**Results**
Some children understood about light being needed for colour but the concept was too difficult to follow for some children. I think it is worth persisting with difficult concepts as it gives extension to children who are able to think in that way. When it came to mixes, some of the grade twos were able to recognise the prime colours and their mixes. Not all, however.
For Preps it was a new concept. Children enjoyed making new colours but those with textas were less successful due to depth of colour of texta. This creation of a problem (predicted by teachers before the lesson) was a good way of checking children's problem solving skills. Again, some were able to work out why they had difficulty, others needed some help.

It was decided to consider one lesson on mini-beasts rather than discard the whole area of animals.

Aim
To add to children’s knowledge on snails by using discussion and observation.

Method
1. Discussion centred around what children already knew of snails’ habitat, eating habits and physical appearance.
2. Discussed the names of the parts and what they did.
3. Split up into groups and went out looking for snails
4. Brought them back and observed them at closer range. Discussion relating to eating habits focussed on the vegetation around their habitats. Children looked for the physical features discussed earlier, particularly the breathing hole.
5. In line with the Melbourne Cup, children then had a Snail Race across wet concrete.
6. Snails were collected and returned to their habitat. Discussed with children the reason they were not allowed to keep the snails as pets.

Results
Children’s knowledge of snails varied greatly, but all enjoyed hunting for them and locating their habitats. Children were all able to observe snails closely, even those students who did not want to touch them were still able to observe.

Aim
To enlarge children’s knowledge of their senses by involvement in practical tasks.

Method
1. Discussed with students about senses - what they are, their purposes.
2. Discussed the arrangements for the session, and children were arranged into
groups and sent to their first activity.
3. Four stations were set up around the school with a number of activities at each
   
   Sight  Taste & smell  Hearing  Touch

4. After a brief discussion about the sense, students participated in the activities.
   These were
   
   Sight - sight test, finger sausage, blind spot
   Taste & smell - identify the four fruits and vegetable which had been
dyed different colours to hide their appearance.
   Hearing - games ‘Who am I’, identify the sounds
   Touch - using a touchy-feely bag students have to identify a common
   object using only touch.

5. After five minutes at each activity, they moved on to the next ‘sense’.

Results
We ran out of time to discuss this as a group at the end. The following day, I asked the
grade twos what they had thought and was able to determine that they understood most
of what they had participated in. Unclear about Preps without further discussion with
them. I hope June does a follow-up.

15. Buddy Science Practical - Fossils 15/12/98

Aim
To extend children’s knowledge and understanding of fossils.

Method
1. Through discussion, find out what children’s current understandings of fossils
   are. Questions such as, ‘How do scientists know how old things are?’ How can
   they know about dinosaurs?
2. Show children the two fossils of a leaf and small fish preserved in stone.
3. Discuss how scientists use plaster casts and relate this to children’s own
   experiences with plaster casts.
4. Describe task of creating fossil remains using plasticine and a small plastic
   animal and then collecting a cast of it.
5. Allow students time to complete the task.
Results
Students needed help with the practicalities of the task such as getting the consistency of the plaster correct before pouring it, and setting up their 'fossil' shape in plasticine. The casts needed several hours to dry, but turned out very well. Discussion had to be delayed due to casts not drying sufficiently in an hour (most children had made theirs too moist). Coral also had a meeting that afternoon which precluded further follow-up discussion.
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