

Teacher effectiveness in the education of gifted students : a comparison of trained, trainee and untrained teachers of gifted and talented students

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**TEACHER EFFECTIVENESS IN THE EDUCATION OF
GIFTED STUDENTS:
A Comparison of Trained, Trainee and Untrained
Teachers of Gifted and Talented Students.**

**by
JENNIFER LOUISE ROWLEY**

**Submitted to the School of Education, The University of New
South Wales, in partial fulfilment of the requirements for the
degree of Doctor of Philosophy,
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ABSTRACT

This study sought to determine whether specialised teacher training in gifted education assisted teachers in developing teaching skills, competencies and classroom climates identified as effective in teaching gifted and talented students. How best to prepare teachers of the gifted is well researched in the literature, however less research is available on how effective the training of these teachers is when they are faced with the challenge of catering for the gifted student in the classroom.

This study examined differences between teachers *trained* (n=56), those currently *undertaking training* (n=31) and those *untrained* (n=80) in gifted education. A total of 167 teachers in eastern Australian schools teaching gifted students were observed in a variety of classroom settings. This study also examined aspects of the classroom climate of those teachers by interviewing a sample of five nominated gifted students being taught in 57 of the 167 classrooms visited.

Both teachers *trained* and those currently *undertaking training* in gifted education demonstrated better teaching skills than the *untrained* group. A sample of 285 nominated gifted students (34% of the total sample) indicated that the *trained* and *trainee* teachers established better classroom climates with more emphasis placed on cognitive dimensions (higher level thinking - analysis, synthesis, evaluation) and affective dimensions (discussion and feelings) and less emphasis on lower level thinking (memory) and lecturing than the *untrained* group. Results of this study clearly show that teachers still in training, most of whom were only half way

through a rigorous 18 month training program, were more like their *trained* colleagues than they were like their *untrained* colleagues.

Table of Contents

<u>PART ONE: INTRODUCTION</u>		<u>Page</u>
<u>Chapter 1 Introduction</u>		
1.1	Background to the study	1
1.2	Statement of the problem	12
1)	Significance of the study	15
2)	Research questions	17
PART TWO: LITERATURE REVIEW		
<u>Chapter 2 An introduction to the theoretical rationale</u>		
2.1	Aims and justifications of the study	20
2.2	Individualising instruction and Schön's reflective practitioner	23
2.3	The influence of Gagné's differentiated model of giftedness and talent on the development of the present study	28
<u>Chapter 3 Review of the literature</u>		
3.1	Introduction to the literature review	33
3.1	Teacher characteristics	35
3.2	Adult learning theory	50

3.3	Teaching skills, strategies, techniques and competencies	59
3.4	Teacher training and professional development in gifted education: models and practices	76
3.6	The novice versus expert teacher and teacher effectiveness	96
3.7	Certification and endorsement of gifted education teachers	102
3.8	Instruments: Observational studies and rating scales to assess teaching skills	105
3.9	Instruments: Observation and questionnaires measuring student perceptions of teachers' classroom climate focus and environment	111
3.10	Summary	117

PART THREE: METHODOLOGICAL CONSIDERATIONS

Chapter 4 Methodology

4.1	Introduction	124
4.2	Instruments	127
	(i) PIF (Participant Information Form)	
	(ii) TOF (Teacher Observation Form)	
	(iii) CAQ (Class Activities Questionnaire)	

4.3	Methodological considerations	138
4.4	Research design	155
4.5	Characteristics of the sample	158
4.6	Selection and training of raters	167
4.7	Hypotheses	172
4.8	Summary	175

PART FOUR: RESULTS

Chapter 5 Results

5.1	Data analysis	178
5.2	Teacher Observation Form (TOF) results testing hypothesis one	183
5.3	Class Activities Questionnaire (CAQ) results testing hypothesis two	193
5.4	Participant Information Form (PIF) correlated with teaching skills: results testing hypothesis three	205
5.5	Participant Information Form (PIF) correlated with classroom climate: results testing hypothesis four	208
5.6	Qualitative data: students' perceptions of the classroom climate	211
5.7	Summary of the results testing the hypotheses	224

Chapter 6 Discussion

6.1	Introduction	228
6.2	Principal analysis: specialised training in gifted education and teaching skills	233
6.3	Teacher training and the classroom climate	248

6.4	Correlations: background variables and teaching skills	253
6.5	Correlations: background variables and the classroom climate	258
6.6	Summary	266

Chapter 7 Conclusions, limitations of the study, recommendations and implications for future research

7,1	Proposed 'developmental' model of teacher effectiveness in gifted education	268
(i)	Applying the 'developmental' model of teacher effectiveness in gifted education	273
7.3	Conclusions: response to the research questions and the hypotheses	279
7.4	Limitations of the study	286
7.5	Recommendations for future research	289
7.6	Implications for professional practice	292

REFERENCES	297
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APPENDICES

Appendix A	322
Participant Information Form (PIF) Instrument	
Appendix B	325
Teacher Observation Form (TOF) Instrument	
Appendix C	327
Class Activities Questionnaire (CAQ) Instrument	
Appendix D	331
(i) Steele's (1981) Factor Analysis for the Class Activities Questionnaire (CAQ) Instrument	
(ii) Item total reliability for the Teacher Observation Form (TOF) Instrument	
Appendix E	338
(i) Correspondence (participants)	
(ii) How and when participants gathered	
Appendix F	340
(i) Interview schedule (telephone interview schedule)	

Appendix G	342
(i) Correspondence (raters)	
(ii) Rater questionnaire	
(iii) Observation guidelines and protocol	
(iv) Results of simulated teacher observation at the rater training sessions	
 Appendix H	 343
(i) Scree Diagram for the CAQ	
(ii) Frequency table for teacher observations	

List Of Tables

Table	Title	Page
4.1.	Reliability Coefficients for the CAQ - (Steele 1981 Scoring Manual for the CAQ) and Based on the Horst Formula applied to 131 classes	135
4. 2.	Number of letters sent requesting participation in the study and replies received during 1995	143

4.3. Reasons given by potential trainee teacher participants in the trainee group for non-participation in the study.	145
4.4. The Johari Window (adapted to relate to training in Gifted Education).	149
4.5 Number of letters sent requesting participation in the main study and replies received during 1996 and 1997.	151
4.6. The five most common reasons given for not participating in the study gathered from a telephone interview.	152
4.7. Results of questions asked about not participating in the study gathered from a telephone interview	153
4.8. Frequency of males and females by training	158
4.9. Frequency of males and females by method of teacher training at post-graduate level	159

4.10. Frequency of type of program taught (n=167)	160
4.11. Frequency of primary/secondary level taught for observation (n=167)	161
4.12 Mean number of years of teaching experience (n=167)	161
4.13. Frequency of hours per week contact time with gifted students (n=167).	162
4.14. Frequency of intention to pursue training in gifted education (n=111).	163
4.15. Frequency of satisfaction with current teaching position (n=167)	163
4.16. Frequency of undergraduate grade average (n=167)	164
(i) Responses of Raters on Practice Exercise from final training session using the Teacher Observation Form (TOF)	170
(ii) Mean scores of Raters on Pilot Study using the Teacher Observation Form (TOF). n=43	171

- 5.1 Composite means and standard deviations
for *trained*, *trainee* and *untrained* teachers of
gifted and talented students for a composite score
on the Teacher Observation Form (TOF) n=167 184
- 5.2. Composite means, standard deviations and level of
significance for trained and untrained teachers of gifted
and talented students for a composite score on the
Teacher Observation Form (TOF) n=136. 185
- 5.3. Composite means, standard deviations and level of
significance for trainee and untrained teachers of gifted
and talented students for a composite score on the Teacher
Observation Form (TOF) n=111. 185
- 5.4. Composite means, standard deviations and level of
significance for trained and trainee teachers of gifted
and talented students for a composite score on the
Teacher Observation Form (TOF) n=87. 186
- 5.5. Items identified by principal components analysis,
eigenvalues and Cronbach alpha reliability coefficients
for trained and trainee teachers of gifted and talented

- students for a composite score on the Teacher Observation Form (TOF). 188
- 5.6. Item means, standard deviations and level of significance for trained and untrained teachers of gifted and talented students for individual items on the Teacher Observation Form (TOF) n=136. 189
- 5.7. Item means, standard deviations and level of significance for trainee and untrained teachers of gifted and talented students for individual items on the Teacher Observation Form (TOF) n=111. 190
- 5.8. Item means, standard deviations and level of significance for trained and trainee teachers of gifted and talented students for individual items on the Teacher Observation Form (TOF) n=87. 192
- 5.9. Composite means, standard deviations and level of significance for trained and untrained teachers of gifted and talented students on a composite score for the Class Activities Questionnaire (CAQ) n=265. 194

- 5.10. Composite means, standard deviations and level of significance for untrained and trainee teachers of gifted and talented on a composite score for the Class Activities Questionnaire (CAQ) $n=195$. 195
- 5.11. Composite means, standard deviations and level of significance for trained and trainee teachers of gifted and talented students on a composite score for the Class Activities Questionnaire (CAQ) $n=110$. 195
- 5.12. Items identified by principal components analysis, eigenvalues and Cronbach alpha reliability coefficients for trained teachers of gifted and talented students for a composite score on the Class Activities Questionnaire 197
- 5.13. Principal components analysis (varimax rotation) for the identified items (with factor loadings) for the Class Activities Questionnaire (CAQ). 198
- 5.14. Item means and standard deviations for trainee and untrained teachers for the Class Activities Questionnaire (CAQ) $n=195$. 200

- 5.15. Comparison of trained and untrained teachers on the four dimensions of the Class Activities Questionnaire (CAQ). n=285. 201
- 5.16. Comparison of trainee and untrained teachers on the four dimensions of the Class Activities Questionnaire (CAQ). n=195. 202
- 5.17. Comparison of trained, untrained and trainee teachers across the four dimensions of the Class Activities Questionnaire (CAQ). n=285. 204
- 5.18. Pearson product correlation coefficients for PIF background variables and total scores on the Teacher Observation Form (TOF). n=167. 207
- 5.19. Pearson product correlation coefficients for Participant Information Form (PIF) background variables and classroom climate as measured by the Class Activities Questionnaire (CAQ) n=285. 210
- 5.20. Open response comments (qualitative data) collected from the Class Activities Questionnaire (CAQ) open

response item “List the three best things about this class” categorised according to training (n=275). 213

5.21. Open response comments (qualitative data) collected from the Class Activities Questionnaire (CAQ) item “What three things would you change about the class?” categorised according to training (n=275). 216

6.1. Summary of Teacher Observation Form (TOF) items ranked highest in a comparison of trained and untrained teachers and the trainee and untrained teachers. 235

List Of Figures

Figure	Title	Page
Figure 1:	Gagné's differentiated model of giftedness and talent.	28
Figure 2:	Lewin's (1951) experiential learning model	53
Figure 3:	Proposed 'developmental' model of teacher effectiveness in gifted education	269

PART ONE: INTRODUCTION

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

"The key to any good educational program is well-trained personnel and the proper administrative structure in which to put their training to maximum use. Without such appropriate background and training, all else is meaningless and a sham" (Gallagher, 1985, p. 396).

Many educators in the past tended to believe that 'bright' children would be academically successful at school regardless of any other factors - factors such as teacher effectiveness, school or home environment, the child's personality, everyday or extraordinary events or motivational issues. Much of the research in the last 30 years has sought to dispel that myth, and has searched specifically for the catalysts that are instrumental in the development of high *ability* into high *achievement* (Bloom, 1985; Feldhusen, 1985; Gagné 1999; Gallagher, 2000; Gross, 1994a; Kanevsky, 1992; Keirouz, 1993). In his Report to the United States' Congress, Marland (1971), stated that "...we are increasingly being stripped of the comfortable notion that a bright mind will make its own way...intellectual and creative talent cannot survive educational neglect and apathy" (Marland, 1971, p.1).

A study of talent development by Bloom (1985) found evidence that individuals will not attain extreme levels of capability without a process of appropriate nurturing, education, training and encouragement. Gagné's (1995) 'differentiated model of giftedness and talent' sought specifically to include factors or *catalysts* that act as a bridge between the natural *ability* which he terms 'giftedness', and the measurable display of *achievement*, which he calls 'talent'. Amongst the catalysts identified by Gagné (1995) was a cluster which he classified as 'environmental'. This cluster included the identification of the teacher as one of the persons involved in the developmental process of learning, training and practice essential to develop a talent. Teacher effectiveness is vital if teachers are to act as a positive environmental catalyst for the development of talent.

It is true that throughout history people have always been intrigued by those, both young and old, who have displayed superior ability. Although it is widely accepted that the valuing and recognition of a superior ability or gift is determined by the culture in which the gift is displayed (Tirri, 1993), there still remains much debate concerning the definition of giftedness. Gagné (1985) approached the issue of defining giftedness in a qualitative manner and stated that giftedness is conceptualised as outstanding *ability* in a number of aptitude domains and that talent is conceptualised as outstanding *achievement* in various related fields. Gross (1993) and Silverman (1993) went further to describe levels of giftedness, defining the highly gifted as those whose advancement is significantly beyond the norm of the gifted.

The present study is not concerned with definitions of giftedness and, indeed, is predicated on Gagné's (1985) definition of giftedness and talent. Rather, this study

sought to investigate whether specific teacher training in gifted education improved the quality and effectiveness of teaching and classroom climate thus facilitating effective learning for gifted and talented students.

Although research reveals that intellectually gifted children should be grouped together for a significant proportion of their class time (Feldhusen, 1991; Gross, 1994b; Hollingworth, 1942; Kulik & Kulik, 1982; Tannenbaum, 1983), many schools are reluctant to adopt such a model. Furthermore, the literature suggests that it is not enough for educators merely to acknowledge that giftedness exists and deserves to be provided for, they must also be aware of the range of abilities within the gifted population (Silverman, 1993; Gross, 1992). Gross (1993) identified four levels of giftedness as moderately gifted (IQ 130-144); highly gifted (IQ 145-159); exceptionally gifted (IQ 160-179) and profoundly gifted (IQ 180+). These different levels of giftedness require appropriately differentiated interventions (Silverman 1993; Tannenbaum, 1983) and the success or failure of provisions for gifted students thus depends heavily on the school being able and willing to provide relevant curricula that are academically, socially and emotionally challenging. It is also imperative that classrooms provide teaching expertise, imagination and flexibility by the teacher responsible for the education of the gifted (Carrington & Bailey, 2000; Hansen, 1988; Rogers, 2002).

Gagné's (1995) 'differentiated model of giftedness and talent' (DMGT) shows a diagrammatic representation of the link between high *potential* (giftedness) and high *performance* (talent) - the link being a group of *catalysts* that may interact negatively and/or positively upon the systematic development of the gift into a talent. The person possessing the gift may or may not become talented - that is

they may or may not demonstrate a superior achievement in one or more fields of talent as listed in the model. Gagné's (1995) 'differentiated model of giftedness and talent' (Figure 1) is included in the following Chapter where the model is operationalised in relation to the proposed model of the present study.

It must be emphasised that Gagné's (1985) definition of giftedness and talent allows for the person to be gifted without being talented. To explain the relationship between giftedness and talent, Gagné puts a cluster of *catalytic variables* in the centre of his model that can either assist or hinder the development of the gift into a talent. It is the specific centralised process of learning, training and practising, along with the catalysts as represented by Gagné's (1995) model, that have contributed to this study of teacher effectiveness.

The present study has utilised Gagné's (1985) concept of *catalytic variables* as a conceptual framework and reviewed Gagné's (1995) translation of the *gift* (or natural ability) into a high level of systematically trained *talent* (or a measurable performance) as directly associated with aspects of the *catalysts* - the teacher being a part of the environmental aspects that contributes to the interaction of the catalysts. If both, or either or, in fact, neither home and school environments enhance or retard the expression of talent, the model affirms the significance of how these two environments, along with other environmental catalysts, (undertakings, events and chance), all influence the outcome of a systematically trained talent through the quality of learning, training and practice.

If the present study accepts Gagné's (1985) concept of *catalytic variables* as a conceptual framework, then it is proposed that the teacher is not the neutral person

but rather someone who contributes positively or negatively to the development and expression of *talent* for gifted and talented students. However, when we consider how that *talent* develops over time, it is apparent that the teacher and the school have a crucial role to play in identifying *giftedness* and in providing a facilitative environment in which the expression of *talent* may emerge - particularly as a result of the interaction of the catalysts on learning, training and practice. Therefore, the teacher, the interaction of the *catalysts* and the impact of teacher training in gifted education on the effectiveness of the teaching skills used with gifted and talented students, are the main concerns explored in the present study.

The present study is a quasi-replication of an American study of Hansen (1988) who observed 19 untrained and 54 trained teachers of gifted students in Indiana to measure the effectiveness of teacher training and how it correlated with observable teaching skills and classroom climate. This important study was replicated in Australia both because no research of this nature had been undertaken outside North America and because the training of teachers in gifted education was expanding in that country. Hansen (1988) measured observable teaching skills of 63 teachers of gifted students using an instrument designed at Purdue University, Indiana. The participants in the Hansen (1988) study were all trained teachers and 54 were trained specifically in gifted education, whilst 19 had not undertaken any specialised training in gifted education. University personnel who had specialised training in gifted education completed the observation checklist instrument, The *Teacher Observation Form (TOF)*, to measure observable teaching skills. A sample of five identified gifted students was surveyed from each classroom of the 63 teachers using the *Class Activities Questionnaire (CAQ)* to determine the classroom climate.

Hansen (1988) concluded from her study that teachers who have specialised training in meeting the needs of gifted and talented students are more effective and demonstrated greater teaching skills and developed more positive classroom climates than those teachers who did not undertake specialised training in gifted education. Hansen (1988) also found that the success of an educational program in school depends heavily on the effectiveness of the teacher and the effectiveness of the teacher depends heavily on the experience of specialised training in the teacher training program. She concluded that studying the teacher of the gifted has increased our knowledge of the skills that characterise an effective teacher of gifted children either in the regular classroom or in special settings and it has assisted in the development of standards for training teachers in gifted education (Hansen, 1988).

It should also be noted that Hansen (1988) posited that the results of her study reflected a need for mandatory certification of all teachers who are responsible for teaching gifted and talented students. At the time of her study, there were 23 States in the America that had an endorsement process for teachers responsible for gifted students in their classrooms. As Australia has no mandatory process of certifying teachers to teach gifted and talented students, the present study sought to determine whether the process of specialised training in gifted education leads to improved teaching practice with this group of students in Australian schools as it had done in the United states. Such a result determined locally would add to the research literature advocating for certification of teachers with specialised training to be the only ones responsible for teaching gifted and talented students in Australian schools.

Specialised training for pre-service and inservice teachers in gifted education

Gifted education in Australia is at its most critical stage for the past 50 years as students demand more accountability from our teachers; academically Selective High Schools are emerging in greater numbers; parents, along with the State and Territory Education Departments, expect greater accountability on behalf of the school; and competition between government and independent schools becomes more intense as they vie for student numbers. Teacher training, specifically in gifted education is, therefore, at a critical stage in our country's history as less people are attracted to the teaching profession and teacher numbers are decreasing because trained teachers move out of teaching into related fields of employment. The professional development needs of teachers to identify and cater for gifted and talented students has not changed: teachers still require specialised training in gifted education so that they can appropriately cater for these students' individual special needs.

It must be clearly stated that Australia does not have a National Policy on Gifted Education and, in fact, each State and Territory's Education department has its own gifted education policy and its own set of practices. In general, the policies encourage schools to identify their gifted students and to provide an appropriately differentiated curriculum which responds to these students' academic and socio-affective needs. Currently in New South Wales, the Government Strategy on the Education of Gifted and Talented students requires that schools use a combination of subjective and objective procedures to identify students of high potential. The Strategy also permits students to be educated either within the regular classroom setting through enrichment and differentiation of their learning needs, or within a variety of special programs including accelerated progression or ability grouping.

The state of Victoria has also in place a policy of gifted education, called “Bright Futures”. The policy alerts teachers that gifted students have the potential for achievement that may not be reflected in their schoolwork or through the school’s formal assessment procedures. The policy stresses that the gifted student does not always belong to a homogeneous group as within the different levels of giftedness and talent there exists different levels of intellectual ability requiring different types of educational provision. The primary schools in this state are encouraged to work cooperatively in the secondary schools so that appropriate programs for the gifted and talented student are introduced in primary school years and carried through the students’ secondary education.

Education Queensland has a policy on gifted education, which focuses on two key operating principles being equity and social justice. The policy states that the gifted and talented student is only adequately catered for in schools when the curriculum is inclusive of the individual’s learning needs and when students are recognised and accepted by the whole school community. It highlights that the gifted student population can be disadvantaged by a socio-cultural bias against high ability and achievement and by the teacher’s inability to identify the student’s potential. Western Australia, South Australia, the ACT and Northern Territory have policies and are committed in their approaches to Gifted Education practices. Most of these include identification procedures and curriculum modification practices to enhance the learning of these students in our schools.

Few universities in New South Wales (Australia) offer specialised training in gifted education at the pre-service level, yet a great number of independent and government schools direct their marketing specifically to gifted and talented

students (through the existence of Selective High Schools and self-contained gifted classes). In other States and Territories in Australia, even fewer universities offer specialised training in gifted education at either the pre-service or post-graduate level. The issue which arises is a greater demand for trained teachers to meet the needs of gifted and talented students and a decrease in the supply of teachers generally, with only limited access to specialised training in gifted education. Parker and Karnes (1991) reported that 127 universities in the United States, in 40 states, and eight universities, in five Canadian provinces, offer post-graduate programs in gifted education. When investigating specialised training for pre-service and practicing teachers in gifted education, it is apparent that Australia should follow the United States in its call for a national and united licensing requirement for those who want to teach gifted and talented children. Unfortunately it is uncommon in Australia for an education authority to financially support teachers' training in gifted education or even to encourage such training.

The United States has come a long way in recognising the benefits of specialised teacher training in gifted education, for those responsible for teaching gifted students, and has teacher endorsement and certification in gifted education in 28 of the 50 states (Karnes, Stephens & Whorton, 2000). In fact, the National Association for Gifted Children (1996) developed a set of standards for post-graduate programs in gifted education across the United States. Unfortunately, this has not yet occurred in Australia. The 2001 Report of the Senate Employment, Workplace Relations, Small Business and Education Committee report on the education of gifted and talented students, released in October, 2001, has made 20 recommendations that include mandatory pre-service training of teachers in gifted

education. The findings of this report will be presented in Chapter Three and discussed further in Chapters Six and Seven.

Characteristics and teaching skills of teachers of gifted and talented students

The characteristics and teaching skills of teachers of the gifted have been the focus of much research over the past years with the research on teachers of the gifted concentrating on **psychological characteristics** (Bishop, 1968; Feldhusen, 1985; Hansen, 1988; Hansen & Feldhusen, 1994; Hultgren & Seeley, 1982; Maker, 1975; Rogers, 2002; Silverman, 1980), **teaching competencies** (Baldwin, 1993; Batten, Marland & Khamis, 1993; Gallagher, 1985; Hansen, 1988; Hansen & Feldhusen, 1994; Persson, 1999; Seeley, 1979; Whitlock & DuCette, 1989) and **teacher training programs** (Feldhusen, 1985; Gross 1994c; Hansen, 1988; Hansen & Feldhusen, 1994; Rogers, 1989; Cashion & Sullenger, 2000; Tomlinson, 1986). Research on teaching skills focuses on what the teacher aims to develop in the students rather than what the teacher actually exhibits.

A list of 24 perceived competencies needed for teachers of the gifted emerged from research by Hultgren and Seeley (1982). Amongst the top 10 competencies identified were:

- the knowledge and nature and affective/psychological needs of gifted students (including underachievers)
- the ability to construct and/or utilise identification procedures
- the ability to develop methods, materials and approaches to extension and enrichment of subject areas for use with gifted students

- the ability to develop creative problem solving skills
- skill in promoting higher level thinking abilities, questioning techniques
- facilitating independent research

Are these competencies recognised by gifted and talented students as teaching skills that assist their learning? In a synthesis of research on teacher characteristics, Hansen and Feldhusen (1994) found that there were in fact, eight desired characteristics that were repeatedly identified in those who were perceived as 'excellent' teachers of the gifted and they were as follows:

- flexibility, enthusiasm, self-confidence, high intelligence (innate aptitudes)
- appreciation of giftedness, broadly cultured background (acquired competencies)
- ability to foster higher level thinking and problem solving (learned skills)
- capacity to meet personal and social needs of gifted students (a mix of learned skills and innate aptitudes)

Research on teachers of the gifted student has focused mainly on the characteristics and teaching skills necessary for 'effective' teaching and there has been little research involving the direct observations of teachers in order to support those characteristics attributable to the teacher of the gifted as defined in Feldhusen and Hansen's (1994) analysis of the research (Baldwin, Vialle & Clarke, 2000). The present study proposed to assess the teaching skills used by three groups (teachers *trained* in gifted education, those teachers *undergoing training* in gifted education and those teachers *untrained* in gifted education) to evaluate whether significant differences appeared in using the teaching skills that research has shown to be particularly effective in facilitating gifted and talented students'

learning. The degree of specialised training was measured by a minimum amount of post-graduate training exclusively in gifted education (see Chapter Four), thus determining whether these competencies were indeed apparent.

Very few models of teacher training in gifted education have been tested for effectiveness. Most teacher training programs would claim that they develop a variety of teaching skills, although little is known about the extent to which the goals of the teacher training programs in gifted education are correlated with the observable teaching skills and competencies of practising classroom teachers of gifted students. The aim of this study was to investigate differences in teaching skills and classroom climate between teachers specially *trained* in gifted education, *trainee* teachers and *untrained* in gifted education (all of whom were teaching gifted students) and to investigate the psychological, demographic and experiential variables associated with teaching skills and classroom climate.

1.2 STATEMENT OF THE PROBLEM

"The success of an educational program depends heavily on the effectiveness of the teachers" (Hansen & Feldhusen, 1994, p.114).

Some researchers claim that by studying the teacher of the gifted they have increased their knowledge of the teaching skills that characterise an effective teacher in a classroom of gifted children. It has also assisted in the development of standards for training teachers in gifted education (Hansen & Feldhusen, 1994). However, research on this is by no means consistent.

Calderhead and Robson (1991) found that teacher training programs do little if nothing to alter pre-service teachers' misconceptions regarding student needs, while on the other hand, Kagan (1992) believes that these misconceptions can be altered if teachers undertake specialised training that challenges their beliefs. Teachers of the gifted require specialised teacher training that is appropriate to their role as teachers of the gifted and talented so that they can develop specific teaching skills to cater for the range of learners in their classrooms. The perception, therefore, is that teacher training programs should focus on developing the skills required that quantify an effective of the gifted so that the teacher is equipped to meet the needs of gifted students in the classroom.

Robinson and Robinson (1982) propose that effective teaching must be based on the recognition of three basic premises of learning: firstly, that learning is sequential, developmental and gradual; secondly, that there are substantial differences in learning rates among individuals of any given age; and thirdly, that effective teaching must involve assessment of the individual student and their particular status in the learning process, followed by a presentation of the problems that slightly exceed the level already mastered.

In 15 out of 16 studies reviewed by Needels and Gage (1991) on teacher training programs for the teacher of the gifted students, substantial effects on teachers' instructional practice and on students' achievement were reported as a result of teacher inservice and post-graduate training. These data from 567 classrooms substantiated the claim by Needels and Gage (1991) that teacher inservice and post-graduate training raised teacher effectiveness substantially.

The availability of specialised teacher training in gifted education in Australia is limited and, as previously stated, it is often an elective course in both pre-service and post-graduate teacher education programs. Unfortunately, teachers who do not have specialised training in gifted education are commonly allocated to teach groups of gifted students in Selective High Schools and teachers in the mixed ability classroom will undoubtedly have one or more gifted children in their classes. Despite agreement in the research that gifted children exist and need a differentiated approach to their learning and that teacher training programs are necessary to provide teachers with the necessary teaching skills to facilitate the learning of these gifted students, the question of the effectiveness of specialised teacher training programs has not been tested. The purpose, therefore, of this study was twofold as it sought to determine who should be responsible for teaching gifted and talented students in Australian schools. The present study investigated who should be responsible for teaching gifted learners by comparing the teaching skills of those teachers *trained*, to those teachers *in training* and those teachers *untrained* in gifted education; and by comparing the classroom climate of practising teachers of gifted students who are *trained*, to those teachers *in training* and those *untrained* in gifted education.

1.3 SIGNIFICANCE OF THE STUDY

"The teacher is recognised as the central person who determines the thinking emphasised in the classroom" (Gallagher & Jenne, 1963, p. 28).

When learning a new task is too difficult, students are frustrated and when it is too simple, they become bored and disinterested in the learning process. If the task is pitched just right and matched to a student's individual needs and learning readiness, then the skill or concept is well learned and will be more effectively remembered and applied to other similar problems (Feldhusen & Klausmeier, 1959; Kanevsky, 1995; Keirouz, 1993). It is the teacher's responsibility to ensure that the learning is appropriate to the needs of the students and that the teacher is adequately equipped to facilitate learning to ensure that the student grows through learning, effectively utilises a higher level order of thinking skills, and leaves that class with the resources to access more than the lower order thinking skills of knowledge and comprehension problems (Feldhusen & Klausmeier, 1959).

The significance, therefore, of this study lies in the question of who should be responsible for teaching gifted students in Australian schools. Documentation about the relationship between specialised teacher training in gifted education and the reported desired teaching skills and competencies of teachers of the gifted should be provided to the administrators responsible for the education of gifted students. The aim of the study was to investigate the relationship between teacher training programs for teachers of the gifted and observable teaching skills of teachers of gifted students by investigating the extent to which teacher training program goals are correlated with observable teaching skills of teachers of the gifted. The experimental hypotheses were conducted by comparing the teaching

skills of teachers who received training in gifted education to those who did not; and by comparing the instructional climate in classrooms of teachers who received training in gifted education with those who did not.

The pre-service teacher training program should ensure that the teachers assigned to the gifted and talented students' classes have been thoroughly trained in gifted education and that they are suited to interact with intellectually gifted students (Belcastro, 1987). It must be the goal of the teacher training program to maximise the current research literature to facilitate the way in which teachers learn about gifted and talented students. The more the pre-service teacher knows, understands and experiences with gifted and talented students, the better able they will be to assist the student to learn. It is not enough that the pre-service teacher acquires curriculum content and subject knowledge, they must also know and learn about the students' learning.

An important contribution of this study will be the data provided about the effectiveness of specialised teacher training. These data may support the establishment of certification guidelines for teachers of the gifted in Australia. The establishment of certification guidelines will assist administrators to choose teachers who have specialised training in teaching gifted and talented students to such positions (for example in primary Opportunity Classes and Selective High Schools). Teachers who want to teach gifted and talented students will be encouraged to undertake specialised training in gifted education to ensure they have the appropriate teaching skills. Teaching gifted and talented children is exhilarating, exhausting and is not an easy task. Teachers must be willing to accept a challenge that requires high energy levels; the flexibility to sometimes

follow unusual ideas that change the direction of the lesson in the most unpredictable way and to devote extra time and effort to their teaching so as to appropriately provide for the energetic and varied needs of their students.

1.4 RESEARCH QUESTIONS

"Social researchers do not conduct research on a topic...Researchers refine and narrow down a topic into a problem or a question...Research questions refer to the relationships among a small number of variables...and has one or a small number of causal relationships" (Neuman, 1997, p. 119-121).

This study was designed to focus on the relationship between post-graduate teacher training programs in gifted education and the development of the teaching skills which were specifically viewed as effective with gifted students. It was proposed to examine the classroom climate in relation to teaching skills demonstrated by the teachers teaching gifted and talented children. From this basic premise emerged the following research questions that guided the study.

Research Questions Question One

- a) Are there observable differences in teaching skills between teachers *trained* in gifted education and teachers who are *untrained* in gifted education?
- b) Are there observable differences in teaching skills between teachers already *trained* in gifted education and teachers *currently training* in gifted education?
- c) Are there observable differences in teaching skills between teachers who are *untrained* in gifted education and teachers who are *currently training* in gifted education?

Question Two

- a) Are there significant differences in the class climate of classrooms taught by teachers *trained* in gifted education and teachers who are *untrained* in gifted education?
- b) Are there significant differences in the class climate of classrooms taught by teachers already *trained* in gifted education and teachers *currently training* in gifted education?
- c) Are there significant differences in the class climate of classrooms taught by teachers who are *untrained* in gifted education and teachers *currently training* in gifted education?

Question Three

- a) Are there any psychological, demographic or experiential variables that are correlated significantly with observable teaching skills of teachers who are *trained* in gifted education?
- b) Are there any psychological, demographic or experiential variables that are correlated significantly with observable teaching skills of teachers who are *currently training* in gifted education?
- c) Are there any psychological, demographic or experiential variables that are correlated significantly with observable teaching skills of teachers who are *untrained* in gifted education?

Question Four

- a) Are there any psychological, demographic or experiential variables that are correlated significantly with class climate in classrooms of teachers who are *trained* in gifted education?
- b) Are there any psychological, demographic or experiential variables that are correlated significantly with class climate in classrooms of teachers who are *currently training* in gifted education?
- c) Are there any psychological, demographic or experiential variables that are correlated significantly with class climate in classrooms of teachers who are *untrained* in gifted education?

PART TWO: LITERATURE REVIEW

CHAPTER 2

AN INTRODUCTION TO THE THEORETICAL RATIONALE

2.1 AIMS AND JUSTIFICATIONS OF THE STUDY

"...most persons in the profession would agree that teaching gifted and talented students unquestionably requires special competencies, training and commitment..." (Renzulli, 1985, p. 24).

Fifteen years ago, Start (1985) reported that teacher training in identifying and meeting the needs of gifted children was virtually non-existent and relevant course offerings were rare; with most courses in Australia, being elective and not compulsory. In the United States from 1985-86, however, almost 140 universities offered on-campus post-graduate programs expressly for teachers of gifted children (Parker & Karnes, 1991). Although Australia's record is meagre by comparison, there is now widespread acknowledgment of the need for specialist teachers for the gifted, and relevant post-graduate courses are being offered at several universities. Unfortunately, the myth that bright children do not need special provision made for them is being perpetuated in our Australian schools (Gross, 1994a). Furthermore, many teachers feel that gifted programs set the child apart. Goldberg (1981) found that, together with many lay persons, too many teachers believed that the ability to get along with everybody was of major

importance and that school procedures which singled out children as more able than the generality might jeopardise their sense of identity with, and acceptance by, the 'common man'.

Teachers are surrounded by an environment that honours teaching and learning and schools have a responsibility to offer teachers avenues of professional development to enhance their teaching skills and more appropriately provide for their students. Gross (1997) conducted a study (n=67) that assessed teachers' attitudes towards gifted students pre and post specialised training in gifted education. The findings reported a change in teacher attitudes toward gifted students as a result of inservice teacher professional development (Gross, 1997). It was also reported that post-graduate training programs were significant in altering approaches to learning for gifted and talented students and that the participants in these post-graduate teacher training programs were able to use skills and competencies developed through their training to then, in turn, provide inservice training to staff in their own schools and beyond (Gross, 1997). In this study (n=67) of *trainee* teachers of gifted students, the known benefits resulting from effective teacher training and inservice professional development were a better equipped staff, who are able to provide students with a range of learning options in an environment that stimulates learning (Gross, 1997).

Both trained and untrained teachers in gifted education approach the task of catering for the gifted and talented students in their classrooms with a range of concerns. Concerns about the most appropriate resources to use, concerns about the worth of the differentiated program and little (or no) concern at all about how to cater for the gifted child. In an attempt to address the concerns teachers may have

regarding the gifted and talented students in their classrooms, a framework for differentiating teacher professional development was provided by the Concerns-Based Adoption Model –CBAM (Roberts & Roberts, 1986). Developed at the Texas Research and Development Centre for Teacher Education, the Concerns-Based Adoption Model (CBAM) was based on a series of assumptions about change (Roberts & Roberts, 1986). The strength of this research was in the identification of major issues about gifted students that hindered the successful and effective provision by the teacher. The CBAM addressed some of these issues through the implementation of teacher professional development programs.

The success of any form of professional development is based on an assumption that staff will change as a result of the professional development. It is also desired that this change will incorporate an integration of the professional development offered into the staffs' regular routine within their profession. According to Roberts and Roberts (1986) there are four assumptions about change essential to successful staff development:

- change is a process, not an event
- change is an accomplishment by individuals, not institutions
- change is a highly personal experience
- change entails developmental growth in feelings about a new program and skill in using that program

It is through change, perhaps in attitude, practice and realisation of the individual differences of children, that the teacher develops teaching skills and competencies necessary to facilitate the learning of the gifted child. Sawyer (1988) noted that it is not enough to teach the gifted student how to learn, we must also teach them

"something worth learning" (p. 8). To better facilitate the learning of gifted students, teachers have to embrace change in attitude, perception and teaching practice and to fully engage in the professional development offered to them. The review of the literature presented in Chapter Three provides evidence that specialised teacher training programs in gifted education are instrumental in developing teacher skills. The present study sought to validate this through an observational study of teachers at various levels of training in gifted education.

2.2 INDIVIDUALISING INSTRUCTION AND SCHÖN'S REFLECTIVE PRACTITIONER

"Learn what you already do, in order to be able to choose what you will do" (Schön, 1987, p. 208).

Many research studies (e.g. Hoekman, McCormick & Gross, 1999; Kanevsky, 1995; Keirouz, 1993; Robinson & Robinson, 1982) have proposed that the manifestation of a student's intellectual potential depends somewhat upon the intervention of an educational 'optimal match' (Hoekman et al., 1999; Kanevsky, 1995). In part, this optimal match includes the motivation by the student to develop skills and practices in their chosen field of interest. Robinson and Robinson (1982) concluded that the pace of the instruction, the depth of the content and the breadth of the learning all need to be individualised to better match the needs of the student in order to effect development of the potential. The foundation proposed by Robinson and Robinson (1982) regarding the optimal match (that is matching an educational program to the potential and needs of the student) could be reflected in a program of teacher training in gifted education. This would ensure that the specialised teacher training for the future teachers of the gifted student

was indeed appropriately matched to the individualised needs of the gifted and talented student.

The goals for specialised teacher training programs in gifted education can be obtained from research studies that catalogue desirable teaching skills and competencies of an effective teacher of the gifted (Feldhusen 1985). The goals of teacher training programs, therefore, should include creating facilitators of learning (Cross & Dobbs 1987). Schön's (1987) examination of the Master class in musical performance demonstrates how the teacher created the environment in the classroom by reflecting on their own knowledge of teaching whilst focussing on the performance of the student. In Schön's (1987) description of the relationship between Master teacher and gifted student, the teacher is shown to adopt the role of 'coach'. It is postulated that through this instructional method of coaching that the student will enter into the Master teacher's view of the world which, in turn, will assist the student with their learning (Schön, 1987). At times in the facilitation process, the student has to simply follow the Master teacher's 'modelling' in order to grasp a basic understanding and then proceed alone with an interpretation of the content. The Master teacher reflects on his or her practice, on their knowledge and on their actions during this facilitation process. The process of reflection assists in determining whether instruction is appropriate for the student and if it is not, then the teacher adapts the facilitation methods to strive for improved learning on behalf of the student. It is this particular ability of the teacher to coach, facilitate and promote learning in the student that should be included as a goal of teacher training programs in gifted education.

The role of teacher as facilitator (or coach) demonstrated clearly one of the basic principles of adult learning by highlighting the clear relationships and differences that exist between facilitation and learning. The more the teacher understands about learning the better able she or he is able to select the most appropriate lesson content, instructional skills and strategies. The teacher can not make learning happen - no one can do that. It is, however, the teacher's role to facilitate the learning process. Schön (1987) said that the process of improved facilitation depends greatly on the teacher's ability to reflect on their teaching practices and to improve their instruction through a response to this reflection. Teachers of gifted students are required to appropriately modify their instructional practice so as to address the gifted child's developmental advancement.

There are three distinct (though related) worlds of expertise that Schön (1987) talks about in his description of the reflective practitioner. Firstly, is a world of practice of expert professional (e.g. architects, music teachers, etc.) who are the basic 'first-level' practitioners and who, in fact, own the primary discipline (Andresen, 1992). The next world is that of practice of those who teach others to become expert professionals and whose expertise consists of their mastery of the primary discipline *plus* also their mastery of coaching (or whatever other teaching skills are involved). Their craft of 'teaching expertise' is itself, design-like and is similar in certain respects (but different in manner from) the design-like nature of their primary discipline (Andresen, 1992). Hence, these who teach music are both musicians and teachers. The third world of expertise is, Schön (1987) says, where we find teacher trainers, evaluators and all others whose expertise involves the capacity to *appreciate* the work of teachers of the professional disciplines. By *appreciate*, Schön (1987) means such things as is able to notice subtle qualities in

it; perceive aspects of it that are hidden to a 'layperson'; make fine judgements of quality about it; analyse what they see and generate theories about it; develop a descriptive vocabulary for talking about it, and so on.

It is acknowledged that learning can take place both formally and informally and Hergenhahn (1976) referred to learning as "a relatively permanent change in behaviour or behavioural potential that results from the learning experience" (p.9). Learning and performance are not the same concepts and Hergenhahn (1976) clearly advocated that the performance by the individual may indicate that previous learning has taken place. This demonstration of learning through performance, however, is not the only valid indicator that learning has occurred. There are other valid indicators to substantiate that learning has occurred and as with most skills, learning by self-discovery and practice is a valid learning method (Rogers, 1977). Some other learning indicators are: measuring the objectives of the learning; asking a learner to demonstrate an application of the learning and requiring the learner to teach what he or she has learned (Rogers, 1977). The method of reflective practice acknowledges that learning is a continual process of growth (Schön, 1987).

Instruction is referred to by Shuell and Lee (1976) as any situation in which an "...individual intentionally influences the learning of another individual specifically by structuring the environment of the learner in such a way that the learner will learn the desired objective" (p. 6). It is highlighted by this definition that, although instruction has taken place, it can not be implied that learning has occurred or that the learner has achieved the set objective. One way to measure if the "most

valuable" learning has taken place is to use standardised testing or other methods that allow the learner to demonstrate that learning has occurred.

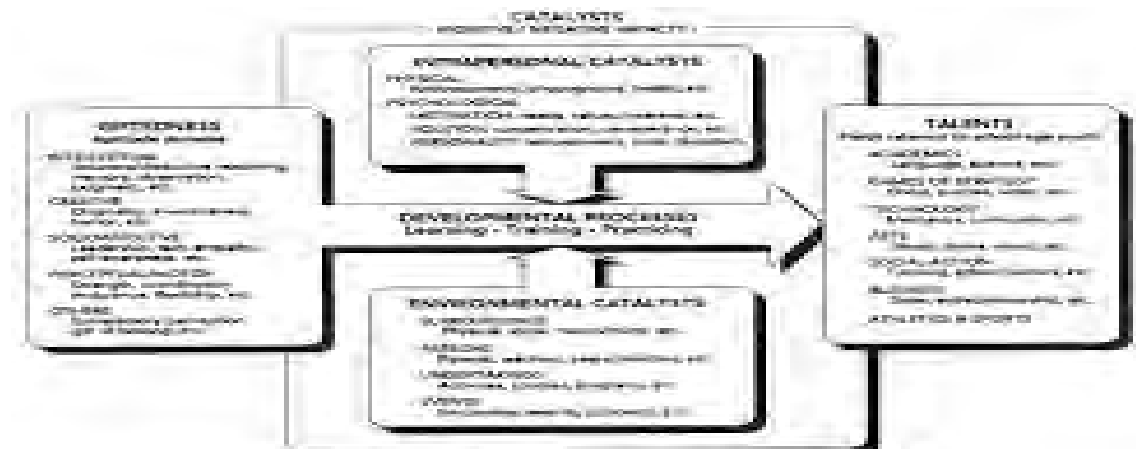
Tomlinson (1986) surveyed teachers (n=336) about their experiences of staff development and inservice sessions in gifted education. Her results indicated that, whilst teachers had a variety of expectations about the professional development they would receive, they found that the most effective inservice sessions were those that expressly addressed their needs and where the grouping was somewhat homogeneous. Tomlinson (1986) recommended that a needs assessment be administered prior to planning an inservice to maximise the effectiveness of the session. It was found that for an inservice session to be of most benefit to the teachers, the facilitator should relay information through lecture and handouts (Tomlinson, 1986). Tomlinson (1986) also found that the facilitator should include simulation activities and teach utilising adult learning principles and through experiential learning techniques. This allows the participant attending the professional development an opportunity to reflect on their knowledge and their actions (Schön, 1987) and to determine their own plan for improving facilitation for gifted students. The successful teacher of the gifted understands the process and the outcomes of reflecting on their teaching practice and can develop and grow as an effective teacher of the gifted through the implementation of reflective practice.

2.3 THE INFLUENCE OF GAGNÉ'S DIFFERENTIATED MODEL OF GIFTEDNESS AND TALENT ON THE DEVELOPMENT OF THE PRESENT STUDY

"The concepts of giftedness and talent share at least two basic characteristics: they both refer (a) to human abilities and (b) to outstanding performances" (Gagné, 1999, p. 127).

As mentioned earlier, the design of this study was influenced by Gagné's (1995) Differentiated Model of Giftedness and Talent which proposes that an individual's potential in any area is translated into performance through the process of learning or training, and that this training is mediated by the influence of personality and environment. It is proposed that teaching skills can be enhanced through a developmental process of learning, training and practice. Gagné's (1995) diagrammatic representation of his model is shown below.

Figure 1: GAGNÉ'S (1995) DIFFERENTIATED MODEL OF GIFTEDNESS AND TALENT



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As introduced in Chapter One, Gagné (1995) produced a differentiated model of giftedness and talent (DMGT) that proposed a distinct difference between *giftedness* (a high degree of natural aptitude) and *talent* (a systematically developed and measurable high level of performance). The focus of particular attention for this study is where the model projects a centralised component - being the *developmental* process of the gift into a talent through potential negative and/or positive interactions of *catalysts*. According to Gagné (1995), the *catalysts* labelled 'intrapersonal' and 'environmental' interact with the *developmental* process of learning, training and practising. As previously stated, the present study was concerned with this centralised *developmental* process of learning, training and practising and interaction of the *catalysts* surrounding it. It is proposed, therefore, that natural teacher characteristics can be systematically developed into effective teaching skills and competencies for gifted and talented students.

A number of different definitions and models of giftedness have risen to prominence over the last 30 years. The Gagné (1995) model, however, is the most appropriate model to guide the present study as it acknowledges the impact of the environment and training on the development of potential into performance. While the Renzulli Model, for example, had significant influence in Australia during the 1980's, it is not appropriate to use in reference to the present study as it does not acknowledge the influence environment and training as catalysts impacting on the development of ability into achievement.

On the left side of Gagné's (1995) model there are abilities that are given or 'innate'. The development of these abilities, in a more systematic fashion through selected interaction with the *catalysts*, is needed to realise a *talent* at a level of

achievement superior to the normal population. At some point in time, the development is extended through learning, training and practising as we try to build one or more specific talents. The product of this development is sometimes a profession whilst others become hobbies. *Gifts* can appear in many domains of ability, while *talents* can be developed in many fields of performance. As previously introduced in Chapter One, *Talent* is defined by Gagné (1995) as "...performance which is distinctly above average in one or more fields of human performance." (Gagné 1985, p. 108) and is measured by the *level* of performance. Gagné (1996) says that there is talent in plumbing, cooking, car mechanics and pop music. It can, therefore, be proposed that there is indeed talent in teaching gifted students and not all teachers achieve the same level of performance.

The elements that are important in the passage from giftedness to talents are in the centre of Gagné's (1995) model under *intrapersonal* and *environmental catalysts*. They are labelled motivation, personality and significant factors and surround the learning, training and practising continuum. The continuum shows that much is relied on in developing a talent area and often there is more attention required in this area at times. For example, the higher the level of talent, the higher the energy that needs to be invested in achieving that level.

Gagné (1995) stated that motivation comprises initiative, interests, needs and perseverance. In Gagné's (1995) model, both *intrinsic* and *extrinsic motivation* is present. The intrinsic motivation is essentially the fact that we embark upon a task or an activity because we desire to rather than being forced by someone else. The *catalysts*, therefore, can have a negative or a positive contribution in the systematic

development of natural ability. Persistence is seen in the model as the energy to overcome obstacles during the development of the *talent*.

Gagné's (1995) model affirmed the significance of the *intrapersonal catalysts*, motivation, personality and temperament, and shows how these personality factors, belonging to each individual, are essential if the student is to develop a talent. For example, a person must have the intrinsic motivation to begin the journey of developing a talent and, indeed, the perseverance to keep going when the road becomes difficult. A degree of initiative is needed to start the journey in the first place coupled with both the desire and the need to maintain interest in the particular chosen area of endeavour. A degree of adaptability, self-esteem and a healthy attitude are also included in Gagné's (1995) *intrapersonal catalysts*. These, along with *environmental catalysts*, such as people, places, interventions, events and chance can all influence the development of talent.

The teacher contributes to the complex interaction of *catalysts* (environmental and intrapersonal) that, in turn, contribute to the developmental process of learning, training and practice, that in turn assists the development of the exceptional level of achievement from the raw or natural aptitude. The teacher is not neutral in this process, but is indeed a vital component in the developmental process described here in Gagné's (1995) *intrapersonal catalyst*. The following review of the literature on teacher characteristics, teaching skills and competencies in Chapter Three outlines the importance of the teacher as a component in the fostering of a talent in gifted students.

Combining all the ingredients in Gagné's (1995) model allows understanding of how all the elements interact to produce an end product or *talent*. Not everyone has the same level of *aptitude* in a given domain, yet two very similar levels of aptitude may in fact produce a very different level of *talent*. For example, two children may have the same level of aptitude in a domain but have different levels of intrapersonal and environmental *catalysts*, with different levels of training. The end result is that the talent areas are different - one may perform well and the other one may not. On the other hand, two children may start with differing levels of aptitude or natural ability. The one with a higher level of aptitude may have less training, learning and practice and, therefore, the production of talent or the measured performance may appear to be the same for both (Gagné, 1996). This illustrates the important role that the *developmental* component and the cluster of *catalysts* have in determining the development of a gift into a talent.

Many professional educators rely heavily upon their pre-service teacher training to provide the resources for a lifetime of experiences in teaching. It is a common reaction from teachers that demands upon their time are exhaustive and that professional development or training is extra work and unachievable. Many teachers, however, seek out and enthusiastically embrace professional development and perhaps these are the teachers who possess the natural abilities that are required to be trained and to produce the competency (performance) as an effective teacher of gifted and talented students.

CHAPTER 3

REVIEW OF THE LITERATURE

3.1 INTRODUCTION TO THE LITERATURE REVIEW

"A great deal of knowledge about best practices in educating gifted students resides in the minds of Master teachers.... Effective teachers simultaneously consider a multitude of student, classroom, subject matter, pedagogical, and personal emotional factors in every instructional decision" (Kitano, Landry, Dougherty & Kanevsky, 2001, p. 206).

The teacher of gifted and talented children who is specially prepared for facilitating the learning of such students, is the focus of this present study. There are particular methodologies recognised as successful in training these teachers and the research base indicates that there are particular traits that characterise these effective teachers (Bishop, 1968; Feldhusen, 1985; Hansen, 1988; Hansen & Feldhusen, 1994; Heath, 1997; Hultgren & Seeley, 1982; Maker, 1975; Rogers, 2002). Specifically, the research shows that these teachers demonstrated more consistently, effective teaching skills and competencies for this particular group of students (Baldwin, 1993; Batten, Marland & Khamis, 1993; Gallagher, 1985; Hansen, 1988; Hansen & Feldhusen, 1994; Maker, 1975; Persson, 1999; Seeley, 1989; Whitlock & DuCette, 1989).

Through the development of specialised teacher training models in gifted education, teaching skills and competencies have been used to change perceptions and attitudes and to better prepare teachers to meet the needs of

gifted and talented students in the classroom (Cashion & Sullenger, 2000; Feldhusen, 1985; Gross 1994c; Hansen, 1988; Hansen & Feldhusen, 1994; Maker, 1975; Sullenger, Cashion & Ball, 1997; Tomlinson, 1986). Reflective practice (Schön, 1987) and adult learning theory (Knowles, 1984; Kolb, 1984) contribute to the understanding of specialised teacher training and teachers' professional development in gifted education. Professional development programs and structured inservicing of teachers already working with the gifted and talented student is an adjunct to this specialised training (Brookfield, 1988; Dettmer & Landrum, 1998; Gross, 1997; Kitano, Landry, Dougherty & Kanevsky, 2001).

Observational rating scale instruments were designed to measure teaching skills to indicate the success of the teacher training (Hansen, 1988; Hobar & Sullivan, 1984; Remmers, 1963; Rosenshine & Furst, 1973; Ryser & Johnsen, 1996). The observational rating scale instruments indicated successful teaching skills and from this information it emerged that the successful teaching skills used with gifted students foster a positive classroom climate that promotes learning (Gentry, Rizza & Gable, 2001; Hansen, 1988; Steele, House & Kerins, 1971).

The present study sought to identify the teaching skills that characterise successful teachers of the gifted, to use these criteria to determine the success of the training program and to investigate how the classroom climate and teaching skills determined the teachers' effectiveness. As mentioned in Chapter 1, this study is a quasi-replication of an American study undertaken by Hansen (1988) who observed 19 untrained and 54 trained teachers of gifted students in Indiana to measure the effectiveness of teacher training and how it correlated with observable teaching skills and classroom climate. She found that *specialised training* in gifted

education was influential and accounted for more effective teaching skills and more positive classroom climates with teachers who had undertaken such training compared to the teachers who did not. Hansen (1988) concluded that studying the teacher of the gifted has increased our knowledge of the skills that characterise an effective teacher of gifted children, either in the regular classroom or in special settings.

This Chapter addresses the research literature concerned with how teachers, as adults, learn; the desirable, and perhaps necessary, teacher characteristics; the teaching skills and competencies required to be a successful teacher of gifted and talented students; models and specialised teacher training programs; the assessment procedures available to measure teaching skills, classroom climate and the teacher's background; the realities of the 'expert versus novice' teacher and teacher effectiveness. Also reviewed is literature concerning the certification process and the endorsement issues surrounding teachers of gifted and talented students.

3.2 TEACHER CHARACTERISTICS

"Since the good teacher in general must be a paragon of pedagogic virtues, the teacher prescribed for the gifted ... turns out to be a paragon of paragons" (Gold, 1965, p. 412).

Witty (1950) was interested in investigating students' impressions of what type of person should teach gifted and talented students. He sent an invitation to students in grades one to twelve across the United States, via a Quiz Kids radio program, asking them to describe the 'teacher who has helped me the most'. Witty's method

of collecting these data proved to be very successful. The response to the Quiz Kids radio program was unprecedented; 14,000 letters were received from children across the United States. From these responses, Witty (1950) detailed the following teacher characteristics: cooperative; displays a democratic attitude; shows kindness and consideration for the individual; patience; wide interests; has a pleasing personal appearance, manner and a good disposition; demonstrates fairness and impartiality; a sense of humour; has consistent behaviour and an interest in pupil's problems; demonstrates flexibility; uses recognition and praise and shows an unusual proficiency in teaching a subject (Witty 1950, p.197).

From this collection of written responses, Witty (1951) prepared a section in his book "The Gifted Child", and the following conclusions were documented about effective teachers of gifted and talented students:

- 1) A teacher of the gifted is determined by their personality (they must be alert, friendly, understanding and constructive in their attitude toward individuals)
- 2) The main concern must be to help children to develop their potential
- 3) The gifted teacher must understand child development
- 4) The teacher of the gifted must work with parents
- 5) A teacher must evaluate her own work

The research by Witty (1950) was ground breaking for its time and Sumption and Luecking (1960) continued the momentum of Witty's research by investigating what level of qualification a teacher of gifted children should be expected to have. It was their purpose to determine selection criteria for teachers who would be responsible for teaching gifted students. They posed the question, "Who should teach the

gifted?" and they concluded from the literature that the following list of characteristics should be used to select teachers for the gifted before they embark on a teaching qualification: superior intelligence; interested in students; democratic, resourceful and creative; display a broad knowledge base; has diverse personal interests, good physical and emotional health and has gained a variety of experiences. The investigation by Sumption and Luecking (1960) was one of the first research articles that addressed the natural characteristics that a teacher of the gifted should possess before commencing specialised teacher training, and the research discussed below supports the conclusions offered by the findings of Sumption and Luecking (1960).

As the director of the Mirman School for Gifted, in California, Mirman (1964) stressed that a positive attitude toward the education of the gifted was an essential criterion for a teacher *qualifying* to teach gifted students. Mirman (1964) stated that lengthy experience is not always necessary for a positive attitude toward the gifted to develop and he listed other traits that characterise a successful teacher of the gifted: security with oneself; sense of humour; flexibility; alertness; belief in individual differences and setting standards of excellence; high intelligence; creativity; strong subject matter, general knowledge background and dedication. Mirman's (1964) list of desirable characteristics resembles Witty's (1950) and Sumption and Luecking's (1960) findings. Many researchers found that the teachers' positive attitude is a desirable characteristic and indeed, a necessary competency. These early writings of Mirman (1964) are, in fact, referenced in many of the empirical research studies on teacher education.

Weiner and O'Shea (1968) investigated attitudes of teachers, supervisors, university faculty and students to assess how favourable they were towards gifted students. This non experimental study used an instrument (the *Weiner Attitude Scale*) designed to measure how favourable one is toward the gifted population. The supervisors were the most favourable, followed by administrators and university faculty, while teachers and university students were the least favourable. Educators with responsibility for teaching gifted students within their schools held more positive attitudes than did those with no direct experience with gifted students. The results were based on a sample of over 1,600 subjects from six states in the United States. This early piece of research concluded that people held more favourable attitudes toward gifted students if they had some direct experience with this group of students. The findings of Weiner and O'Shea (1968) show agreement with Mirman (1964) in recognising the need for a positive attitude and experience with gifted students.

Bishop (1968) assessed personal and social characteristics and behaviours of teachers identified as successful by intellectually gifted, high achieving high school students (n=181). Bishop (1968) asked "What professional attitudes and educational viewpoints characterise these teachers?" and "What are the patterns of classroom behaviour of teachers who are judged effective by gifted students?" His research clearly concluded that there are personal traits (maturity, intelligence, imagination) and attitudes (desire for knowledge, student-centered, systematic) which characterise successful teachers of gifted and talented achieving students. He also concluded that the teachers were creative and desired a high level of personal achievement. This was a rigorous study as it involved a comparison of teachers selected as successful by students (n=109) with a control group of

teachers (n=97) who were selected at random. Bishop (1968) conducted a further analysis with a random group of teachers (n=30) from the group of 109 selected as successful by the high achieving students. After analysing this random group of 30, the results indicated that successful teachers of the gifted held a more favourable attitude toward special provisions for gifted students than did the control group. Bishop's (1968) findings were in agreement with Weiner and O'Shea (1968) in identifying the need for teachers to hold a favourable attitude toward gifted education and support the list of innate teacher characteristics identified by Sumption and Luecking (1960).

Maker (1975) reviewed all available literature on teacher characteristics, and concluded that only two minimal characteristics (ability to relate well to gifted students and an openness to change) were common. She posited that there was not one list of desirable teacher characteristics, but rather a "unique combination of characteristics that enables the teacher to be successful" (Maker, 1975, p. 11). She included the following teacher characteristics as desirable (but less important in her conclusions of the analysis): high intelligence; high emphasis on imagination; respect for individual potential; responsibility and concern for the child and belief in enhancing pupils' self images. These inclusions by Maker (1975) prompted future researchers to examine further the affective dimension that characterise successful teachers of the gifted. She felt that many of the listed innate/natural traits or characteristics could be developed into teacher competencies acquired through specialised teacher training in gifted education. Her study was instrumental in directing post 1975 research toward investigating effective teaching skills that developed identified competencies of teachers of the gifted and away from research on exhaustive lists of teacher characteristics.

Lindsay (1980) summarised the literature on teacher characteristics and asked whether very much had really changed since Gold (1965) suggested that the teacher of the gifted and talented student needed to be a "paragon of paragons of pedagogic virtues" (Lindsay, 1980, p. 13). Although it appears that the comprehensive lists of desirable characteristics project an image of impossible pedagogic paragons, the kind of teacher with these characteristics does exist (Lindsay, 1980). Her contribution to the list of teacher characteristics emphasises that the teacher of the gifted will not be effective unless they truly respect and like themselves and are sensitive and supportive of all others (Lindsay, 1980). This article by Lindsay (1980) carried forward Maker's (1975) reference to the teacher's 'entering' values as an integral part of the successful teacher of the gifted student's 'entering' characteristics. The 'entering' characteristics were those described as natural traits that a prospective teacher or teacher possessed prior to training and the 'exiting' characteristics included those already possessed by the teacher combined with new knowledge, skills and attitudes acquired during the teacher training process (Maker, 1975). The teacher must trust and value him or herself so that they can promote a trust and valuing in the students. Maker (1975) further developed the idea of 'entering' and 'exiting' characteristics first introduced by Gold (1979). These 'exiting' characteristics could be redefined as competencies that are set as goals of the training at the commencement of the program and measured at the conclusion of the teacher training program.

Mills and Berry (1979) like Weiner and O'Shea (1968) investigated differences in attitudes toward gifted children and gifted programs and used the *Weiner Attitude Scale*. Groups surveyed using were all involved with gifted students and comprised of teachers of gifted and talented students and regular classroom

teachers; parents of the gifted; gifted students; administrators; community leaders and the general public (n=853). The research concluded that teachers and parents of gifted students were more favourable in their attitude toward gifted students than were regular classroom teachers. It concluded that those groups with the most contact in a role of responsibility showed a more positive attitude toward the gifted and talented which, it was speculated, was probably due to an understanding of the gifted child through experience and contact. This study by Mills and Berry (1979) again supported the findings of Weiner and O'Shea (1968), that concluded that those groups having the most direct responsibility with gifted students had more positive attitudes toward gifted and talented students than did the groups with less responsibility. Maker (1975) also concluded that 'entering' characteristics of a teacher are attitudes and values that the teacher already possesses. If the teacher does not possess a positive attitude then they may be "prevented from being receptive to encouraging gifted students to trust themselves and trust is a value required to be successful in teaching gifted students" (Maker, 1975, p. 15).

A review of 13 studies to report on the characteristics of an effective teacher of the gifted was conducted by Hultgren and Seeley (1982) and followed on from Maker's (1975) analysis of desirable teacher characteristics. The list of teacher characteristics compiled by Hultgren and Seeley (1982) included: maturity; self-confident; highly intelligent with intellectual interests; imaginative with a sense of humour; achievement orientated; favourable attitude toward the gifted; systematic and orderly; experienced; facilitative (does not direct); hard working; broad general knowledge; subject expertise and a belief in individual differences. Although this review was only seven years after Maker (1975) it can be noted that intelligence, humour and imagination are the only common characteristics found between the

two reviews of available literature on this topic. This is a strong piece of research that is referred to by many other researchers (e.g. Heath, 1997; Feldhusen, 1985; Hansen & Feldhusen, 1994) when examining characteristics of successful teachers of the gifted.

Feldhusen (1985) also reviewed available literature on teacher characteristics of teachers of gifted and talented students. The Feldhusen (1985) review validated and strengthened Hultgren and Seeley's (1982) findings. Feldhusen (1985) concluded that good teachers of gifted and talented students should possess the following desirable teacher characteristics: intelligence; good general knowledge; broad interests; achievement orientated; well organised; enthusiastic; good sense of humour; hard working; flexible; understanding and accepting of gifted students. The review by Feldhusen (1985) will be explored further in sections 3.4 and 3.5. Feldhusen (1985) extended his list of desirable teacher characteristics to include teacher competencies that are the goals of specialised teacher training in gifted education.

The purpose of a study by Silverman (1980) was to observe Master teachers of the gifted and talented (not specifically trained in gifted education) in an attempt to make informal comparisons with regular classroom teachers. The conclusion was that Master teachers displayed a set of characteristics differing from other teachers. This would support the notion by other researchers (e.g. Bishop, 1968; Maker, 1975; Sumption & Luecking, 1960; Witty, 1950) that some teacher characteristics are natural and, as mentioned earlier, Maker (1975) termed these characteristics as 'entering'. Silverman's (1980) research supported the findings of previous research studies (e.g. Bishop, 1968; Maker, 1975; Sumption & Luecking,

1960; Witty, 1950) on teacher characteristics by stating that the Master teachers were: intelligent; warm; creative; dedicated; independent; self-confident; flexible; humorous; had diverse backgrounds; good rapport with students and a good attitude toward the gifted; accepted questioning of their expertise by students and worked well with others. Silverman (1980) concluded that there was the need to train teachers in instructional strategies based on the published list of identified teacher characteristics and a need for a support system for teachers of the gifted and talented. Following on from her study of Master teachers, Silverman (1988) proposed a set of instructional strategies for teachers to use with gifted and talented students and will be discussed in Section 3.4.

Many of the desirable teacher characteristics presented in this synthesis of research literature and studies are akin and, as Willings (1983) describes in his portrait of a 1942 teacher, it is apparent that some teachers possess natural teacher characteristics identified as successful with gifted and talented students. As previously mentioned, Maker (1975) classifies the desirable teacher characteristics as 'entering' and 'exiting' which fosters an understanding of the desirable 'natural' characteristics that teachers may or may not possess before specialised training in gifted education. It is how these 'entering' teacher characteristics are developed during the specialised teacher training into 'exiting' teacher competencies to make an effective teacher of the gifted that is investigated through the observation of teaching skills in the present study. Willings (1983) portrait of the 1942 teacher describes the characteristics of passion, positivity, patriotism, deep religious convictions, eccentricity and a deep and personal caring for students as natural teacher characteristics of gifted students. Willings (1983) detailed the teacher's ability to respond appropriately to the individual's

educational, social and emotional needs. The teacher in 1942 was astutely displaying many of the 'entering' desirable teacher characteristics identified in the research literature (e.g. Feldhusen, 1986; Maker, 1975; Hultgren & Seeley, 1982; Witty, 1950). Maker (1975) qualifies her consideration about 'entering' characteristics by stating that they can also be undesirable. She continues by saying that these undesirable natural characteristics can be modified through specialised teacher training to become desirable 'exiting' characteristics (or perhaps achieved competencies from a teacher education program (Maker, 1975).

Students from Years 7-9 (n=96), who were enrolled in a gifted program in a West Texas Junior High School, were asked to judge the importance of selected teacher characteristics in three different domains - social, personal and cognitive (Maddux, Samples-Lachmann & Cummings, 1985). The results showed that the students had a preference for the social and/or personal characteristics of their teachers over cognitive characteristics and classroom behaviour. Some of the personal/social characteristics included were: humour; friendliness; confidence in students; imagination and treatment of students as adults. This study supports other research (e.g. Feldhusen, 1986; Maker, 1975; Silverman, 1980; Witty, 1950) finding humour and friendliness as important characteristics. These social and personal characteristics are natural characteristics of the teacher that, again, can be associated with Maker's (1975) explanation of 'entering' characteristics.

In a research study by Vialle and Quigley (2001), students in years 7, 9, and 11 enrolled in Selective High Schools in NSW (n=387) were surveyed on the qualities of a good teacher. Student responses were categorised according to the teacher's personality, teaching style/approach and academic ability. The preliminary findings

of this study reported that students selected personal and social qualities and linked intellectual characteristics and teaching strategies to the students' perception of an effective teacher (Vialle & Quigley, 2001). The question posed, and the preliminary findings of the study, supported the results found by Maddux et al., (1985) in determining that students find teachers' personal and social qualities to be important.

Ferrell, Kress and Croft (1988) made a comparison of teacher characteristics between regular classroom teachers (n=47) and teachers teaching in full-time self contained gifted groups (n=37) using an instrument, the *Teacher Perceiver Inventory*. This comparison study concluded that there were characteristics belonging solely to the successful teacher of gifted students that did not belong to the teacher recognised as a 'good teacher' of the regular class. The reported findings were that the teachers of the gifted had higher standards of achievement for their students, placed more emphasis on creativity and displayed greater personal warmth than those teachers in the regular classroom. According to the items identified on the *Teacher Perceiver Inventory*, the Ferrell et al. (1988) research concluded that successful teachers of gifted children possessed focus, Gestalt, innovation, mission, rapport, drive and investment (Persson, 1999). The findings of Ferrell et al. (1988) have been frequently referred to by those investigating teacher characteristics of successful teachers of gifted students in the regular classroom setting (e.g. Hansen & Feldhusen, 1994; Persson, 1999).

A study of Swedish teachers (n=232) resulted in the different findings from the American (Ferrell et al., 1988) study. In fact, Persson (1999) noted that the Swedish teachers did not identify any similar characteristics as being significant on

the *Teacher Perceiver Inventory* used by Ferrell et al. (1988). The Swedish teachers embraced listening, activation, empathy, individualised perception, input drive and motivation (Persson, 1999). The similarities and differences rated by the extensive lists of desirable teachers characteristics (coupled with the very noticeable differences found in their replication study) may indicate areas of difference between the curricula of specialised teacher training and professional development provisions for teachers of gifted and talented students in Sweden and the United States.

Hansen and Feldhusen (1994) conducted a synthesis of the research on teacher characteristics and found that the most important teacher characteristics that emerged from the literature over the past 30 years were: flexibility; enthusiasm; self-confidence; high intelligence; appreciation of giftedness; an ability to foster higher level thinking and problem solving; a broadly cultured background and a capacity to meet the personal and social needs of gifted students. This synthesis of the research literature on desirable teacher characteristics was comprehensive and is referred to by many researchers (e.g. Hansen, 2000; Heath, 1997; Rogers, 2002).

Hansen (2000) further defined the list of desirable teacher characteristics by describing the ideal teacher of the highly gifted student. She referred to the synthesis of research literature (Hansen & Feldhusen, 1994) and included reference to 15 further studies on teacher characteristics to conclude the following three necessary characteristics required by teachers of highly gifted students: competence, deep caring and distinctive character (Hansen, 2000). Referring to desirable teacher characteristics for the highly gifted child is integral to the

understanding of the individual needs and differences of gifted and talented students and how the teachers specialising in gifted education must possess flexibility when teaching a range of gifted and talented students in the one classroom.

Heath (1997) reviewed empirical studies of teacher characteristics that had gathered their data from the perspective of the gifted student. He found that, according to the gifted student, the following traits were the most desirable characteristics for teachers of the gifted: high intelligence, an understanding of giftedness, enthusiasm, drive, self-confidence, originality, achievement, promotion of student independence and a preference for teaching gifted children. Rogers (2002) noted in her comments on Heath's (1997) study that most of the listed characteristics can be classified as personality traits. Two of the listed characteristics are, however, ways that the students like to be taught. Again, it is reported that the student perceives a successful teacher of the gifted to possess social and personality traits as found by Maddux et al., (1985).

Baldwin, Vialle and Clarke (2000) noted that most of the lists of desirable teacher characteristics were, in fact, student perceptions and so, many of the researchers have extrapolated the lists of characteristics from the perspective of the student. Indeed, the exhaustive work in creating extensive lists of desirable teacher characteristics for teachers of the gifted prompts the categorising of the lists as "daunting catalogues of excellence" (Fontana, 1995 as cited in Persson, 1999). Thus, it is demonstrated in this first section of the literature review that many researchers have, indeed, devoted much of their time to compiling comprehensive lists of desirable characteristics of the teacher of the gifted.

SUMMARY

Although Witty's (1950) work offered mostly opinions it was an early effort to gather information about what traits characterise an effective teacher of the gifted. Bishop's (1968) study was designed to analyse selected traits identified as effective by intellectually gifted students and this study offered support to the conclusions reached by Witty (1950). Both Witty's (1950) and Bishop's (1968) studies were descriptive in nature yet Bishop (1968) provided a stronger analysis between identified teachers and other teachers than did the Witty (1950) study. Specifically, Bishop (1968) and the Weiner and O'Shea (1968) study was concerned with personal traits and attitudes of teachers of the gifted and the conclusion was that effective teachers were those who held more favourable attitudes towards this special group of students.

The psychological traits of teachers of the gifted were investigated using the *Weiner Attitude Scale* (an instrument designed to measure attitudes towards gifted education) by Weiner and O'Shea (1968) and Mills and Berry (1979). The results of these two studies supported Bishop's (1968) findings that effective teachers of the gifted had more favourable attitudes toward special provisions for academically able students.

The review of existing literature on effective teachers of the gifted by Maker (1975); Hultgren and Seeley (1982); Feldhusen (1985) and Hansen and Feldhusen (1994) determined that there were innate/natural traits or characteristics that were commonly identified by highly able students. These lists generally indicated characteristics that were intellectual and personalogical such as: highly intelligent with a broad general knowledge and expertise; respect for individual potential;

imaginative/creative, organised and flexible; mature, confident and experienced; caring, enthusiastic and hard working and a good sense of humour. The Maddux et al. (1985) and the Vialle and Quigley (2001) studies showed agreement with this as the sample of 96 students chose social and personal qualities of teachers over cognitive characteristics.

Silverman (1980) was in agreement with many of the listed character traits when she reported on observed characteristics of master teachers working with gifted and talented students. In the comparison of regular teachers with teachers of the gifted, students selected personal character traits (such as warmth and enthusiasm) as being notable characteristics of an effective teacher of the gifted. It should be noted that most of the character trait lists of effective teachers are made up from studies of student perceptions of the effectiveness of the teacher.

To better understand the natural or 'entering' characteristics of the successful teacher of the gifted, Maker (1975) determined in her study that many 'entering' traits can be modified (if not perceived as successful characteristics), whilst others can be transformed through specialised teacher training into successful 'exiting' characteristics. These lists, therefore, can be used to determine teacher training goals, and to assist administrators in selecting teachers for the gifted student.

3.3 ADULT LEARNING THEORY

"When adults teach and learn in one another's company, they find themselves engaging in a challenging, passionate and creative activity" (Brookfield, 1988, p. 99).

Teachers who engage in learning specific to the particular needs of their students are better equipped to provide appropriately for the learners who are in their instructional care (Kanevsky, 1995). By reviewing the literature on understanding and facilitating adult learning, it is apparent that the basic characteristics of the adult learner and the principles surrounding adult learning are some of the foundation stones for effective teaching with gifted and talented students (Brookfield, 1988; Dettmer, 1989; Dettmer & Landrum, 1998; Kitano et al., 2001). With the knowledge and understanding of the desirable characteristics of a successful teacher of gifted students, an understanding of the difference between facilitation and instruction, and an acceptance of the principles of adult learning, it is clear that a collaborative set of successful teacher training and staff development goals will emerge.

Knowles (1984) said that teachers are all adults by definition and adult learners require learning environments and agendas that address the principles of effective adult education. Teachers, as adult learners, are served most effectively in a collaborative atmosphere designed to convey respect for their prior experiences and to help them develop and perform better in their roles (Dettmer & Landrum, 1998). Adult learners value learning opportunities in which the goals and objectives are realistic, job related and useful immediately (Dettmer, 1989). Teachers, as adult learners, will participate more positively when they perceive the goals of whole school or faculty based staff development or training as realistic and

important for immediate application with their students and their learning programs (Dettmer, 1989). Teachers, as learners, will respond positively to training that is specifically designed to trust and respect the fact that they are adults. Therefore, if the teacher believes that there is something available to better equip them for the job of teaching gifted and talented students, then they are likely to approach it in a positive manner. As mentioned earlier, Gross (1994c) reported that teachers entering training (n=67) had a more positive attitude to gifted and talented students and towards the training. Trainee teachers, who choose specialised training in gifted education, had already accepted that the training would improve their ability to better cater for the needs of gifted students (Gross, 1994c).

The general characteristics of the adult learner are best summarised by Knowles (1984) who says that, in any group of adults brought together in a learning situation, there will be a wide variety of adult learner characteristics. Despite these variations, Knowles (1984) stated that it is still possible to identify some of the common characteristics of adult participants in formal learning situations. Some of these characteristics are: adults are all engaged in a process of growth, have a wide variety of background experiences and that they bring to a learning situation certain expectations about education (Knowles, 1984). As ego maintenance is important to adult learning, adults should foster intrinsic motivation and have respect for colleagues participating in the learning (Knowles, 1984).

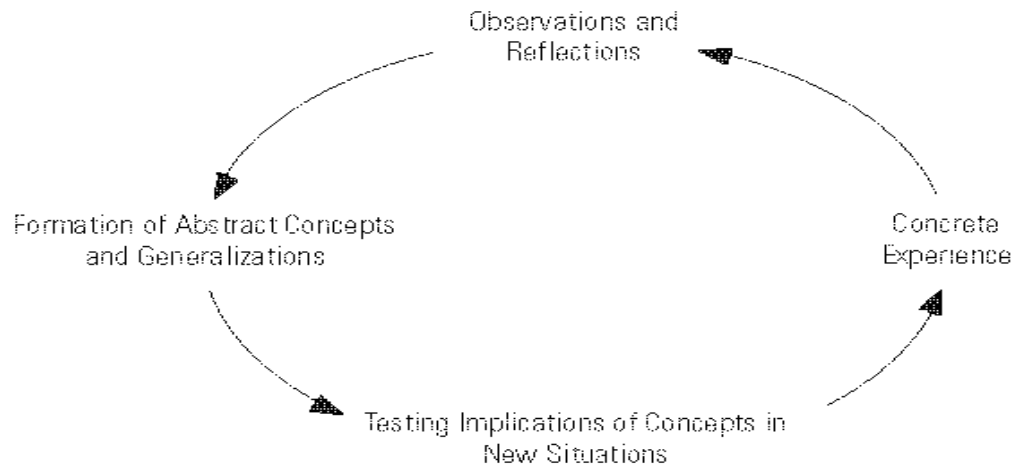
As individuals grow and mature, their need and capacity to be self-directed and to utilise their background and life experiences in learning (to identify a readiness to embrace learning and to organise their learning around their life issues) actually increases on a steady upward trend from infancy through pre-adolescence and

then rapidly during adolescence (Knowles, 1984). The process of growth, in regards to self-directed learning, is particularly relevant to this study as it reflects the trainees readiness to adopt the learning offered in the specialised teacher training and to use self-direction and 'entering' characteristics in their approach to the learning. Self-directed learning also acknowledges that the gifted learner is ready at an earlier chronological age than their age peers to be self-directed in their learning and the teacher must be appropriately trained to facilitate the self-direction of the gifted learner.

One of the listed characteristics of adult learners (Knowles, 1984) is that adults have a wide variety of background experiences. Learning based on experiences is widely reported in the research literature and evidence of this is found in the many experiential learning models in existence (Kolb, 1984; Knowles, 1984; Lewin, 1951). Lewin's (1951) experiential learning model underpins the concepts of learning and training in present study by indicating learning as producing different transformations and understandings according to the way in which the adult learner uses seemingly contradictory ways of dealing with knowledge. One basic principle of adult learning is that people learn from their experiences. Learning based on experiences allows a relationship to be established between the learning and the experience. Lewin's (1951) model is shown in a circular process in which the phases are interrelated. Lewin's (1951) diagrammatic representation of his model is shown below.

Figure 2: LEWIN'S (1951) EXPERIENTIAL LEARNING MODEL

Figure 1 The Lewinian Experiential Learning Model



Source: D.A. Kolb, *Experiential Learning: Experience as the Source of Learning and Development* (Englewood Cliffs, New Jersey: Prentice-Hall, 1984), p. 21.

The concept of *concrete experience* with *observation and reflection* as a component of learning reinforces the adult learners' desire and ability to use their experiences in a self-initiated pursuit of knowledge. It also advocates reflection and observation of the learning to be comprehensive, pervasive and practical. Forming *abstract concepts and generalisations* and *testing implications of concepts in new situations* is needed for learning to be efficient. Combining the learning modes produces various types of knowledge. Lewin (1951) sees experiential learning as producing different transformations and understandings according to the way that we use seemingly contradictory ways of dealing with knowledge. For example, active participation and reflective observation are somewhat opposite in nature as is concrete experience and abstract thinking. Lewin (1951) notes that all these concepts in the model need to be used in co-operation with the learner's background experiences to enhance learning and to make it efficient as the learning processes are interrelated.

Knowles' (1984) summary of adult learning principles describes learning as an active and on-going process for adults and attempts to make sense of the adult's changing experiences. Effective trainers of adults focus on the *facilitation* of learning (the process) and less on the knowledge (content) required by the learner. It is assumed that the adult learner will gain personal knowledge of their specific needs from individual reflection on that experience. The facilitating of adult learning depends largely on the learner and their desire to adopt the learning and to change their behaviours.

As mentioned earlier, Schön's (1987) examination of the Master class in musical performance demonstrated how a teacher reflects on their knowledge and practice when working with students. According to Schön's (1987) concept of reflective practice, this process of reflection determines the teacher's role as one of 'coach'. In fact, Silverman (1980) also found that a Master teacher working with gifted students displayed behaviours similar to a coach in her study of Master teachers versus regular teachers of gifted students mentioned earlier in section 3.2. By adopting a role of coach (or facilitator) it is expected that the student may enter the teacher's view of the world, which, in turn, should assist the student with the learning (Schön, 1987). At times in the facilitation process, the student is directed to follow the teacher's 'modelling' and then proceed alone with an interpretation of the content. It is the ability of a teacher to coach, facilitate and promote learning that creates a learning co-operation between teacher and student. It also demonstrates how the principles of adult learning assist teachers in facilitating learning for gifted and talented students.

If it is possible to sum up what Schön's (1987) work is all about, it might be that it is a “theory of practice” (Andresen, 1992). That idea – putting theory and practice together in one concept – is itself a paradoxical one because theory and practice are customarily put *against* one another. Novak (1988) states that if theory involves a way of thinking about something and practice is the way we go about doing something, then a theory of practice provides a framework for thinking about that in which we are engaged. However, he stated that a theory of practice is not an approach to production, but rather a way of thinking about that which is doing well (Novak, 1988). Schön (1987) noted that all professional practice is design like and the teacher’s ability to design appropriately for learning to occur must involve a wholistic approach to the learning. A design-like practice is learnable but not teachable by classroom methods; it must be learned by doing. Coaching, not teaching, is the most useful intervention to promote learning by doing. The designing involves invention, experimentation, discovery and creation; it is productive and, hence perhaps, can not ever be fully described in advance or anticipated (Schön, 1987).

The research by Kitano et al. (2001) presented instructional dilemmas of practicing teachers (n=5) that exemplify the complex nature of teaching gifted and talented students. This method of collecting information by case study reporting was based on a model where teachers describe an instructional dilemma in a reflective manner (Shulman, 1991). It should be noted that the teachers in this study all taught in self-contained gifted classes at the Roeper School for Gifted Students in the United States (Kitano et al., 2001). The teachers' were asked to reflect on their teaching and this method of case study supports the concept noted by Schön (1987) that learning from *reflection-on-action*; *reflection-in-action*; *reflection-on-*

knowledge and *reflection-in-knowledge* is useful in identifying weaknesses in a professional capacity. Reflective practice can be used to manage change in the teacher's professional life and to transform the instructional dilemma into successful teaching. One way for the teacher trainer to assist the adult learner in the learning process is by establishing a learning climate that encourages responses based on experience; by listening effectively and by asking key questions to assist the adult learner's self reflection. The success of this method of reflective practice in adult learning is dependent upon the adult learner accepting certain parameters of the adult learning principles.

For a teacher's professional development to enhance their teaching skills, the process of self-reflection as described by Schön (1987) should be included in specialised teacher training programs in gifted education. It is noted by Baldwin et al. (2000) that the United Kingdom uses the theory of Schön's (1987) reflective practitioner with trainee teachers in pre-service teacher education programs. They reported that the pre-service teachers are placed in an environment where they assist each other in problem solving classroom management issues, teaching skills and strategies. Schön (1987) described this *reflection-in-action* and *reflection-on-knowledge* as a successful process toward understanding aspects of facilitation that are usually left unexplained. It can, therefore, be noted that encouraging a holistic approach to professional development for teachers of the gifted and talented students encompasses many of the basic principles of adult learning theory.

Learners who take responsibility for their own learning contribute significantly to the learning process (Bailey & Sinclair, 2001). The emphasis is on active learning and

knowledge-making rather than the student adopting a 'sponge-like' role where they unquestioningly soak up the information offered by the teacher (Bailey & Sinclair, 2001). Teachers and students are, therefore, encouraged in a 'hypothesis forming' process to learn from each other (Bailey & Sinclair, 2001). A two way learning process (with teacher acting as facilitator and not instructor) is found throughout the adult learning literature (e.g. Knowles, 1984; Kolb, 1984; Schön, 1987) and forms the basis for many teacher training models at tertiary level. If the two-way learning process can be transmitted to students then the teachers have managed to create a level of challenge through the personalising of the learning to the learner.

Brookfield (1988) supported two way learning by noting that it is not appropriate for teachers to allow their students to learn what they want, by any method they like, just because they are intellectually gifted; the teacher must act as guide, coach and facilitator. Similarly, it is not appropriate for the learners to demand that the teacher fills them up with the teacher's knowledge and experiences. The act of teaching and learning must be mutually respectful if it is to be successful. By utilising the principles of adult learning it is apparent that mutually beneficial foundations can facilitate learning for both the teacher and the gifted student.

SUMMARY

A common theme in the adult learning literature is that all learners need to be actively involved in the learning process and that the learners' prior experiences are relevant to new knowledge acquired during this process. Knowles (1984), Lewin (1951) and Schön, (1987) advocated reflection upon these experiences as it enhances the learning and assists in the transfer into practice. Dettmer, (1989)

and Dettmer and Landrum (1998) encourage teachers engaged in professional development to pursue problem-solving approaches to their own learning as it can provide a model for classroom based activities for their gifted students.

Shulman (1991) and Kitano et. al. (2001) took the practical example of *reflection-in-action* and *reflection-on-knowledge* from Schön, (1987) in a study that directed teachers of gifted students to think of an instructional dilemma. By reflecting and analysing why the particular instructional skill didn't work, the teachers identified issues that assisted in implementing an improved teaching strategy. The study by Kitano et al. (2001) was an example of how to implement Schön's (1987) reflective practice. The teachers in the Kitano et. al. (2001) study (n=5) not only examined the pedagogy but also the environment, the learner and the individuals' advanced learning needs.

Baldwin et al. (2000) note that Schön's, (1987) theory of reflective practice is used extensively in the United Kingdom for training of pre-service teachers. This early introduction to potential teachers to be problem-solvers and facilitators of learning is key to the professional development of practicing teachers as described by Brookfield (1988). Change acquired through professional development was described earlier in the CBAM (Roberts & Roberts, 1986). Through this exploration of the adult learning literature, it is suggested that learning is more likely to lead to behaviour change, when learners believe they can, will or should change. It is also implied by Brookfield (1988) that learning is more likely to improve job performance when the learning experience draws upon skills and practices that are known to be involved in good performance. Implications for both professional development and improved teaching strategies for gifted students are to be found in this review of

the adult learning literature. The concept of problem-solving through reflection on a teacher's teaching practice encourages higher level thinking (analysis, synthesis and evaluation).

Encouraging gifted students to be learners who take responsibility for their learning can contribute to the learning process (Bailey & Sinclair, 2001). The similarity between adult learning principles and practices and identified successful teaching strategies for teachers of the gifted is highlighted in this review. It also shows the consistencies amongst many of the practices described and explores how these practices can be adopted and used as teaching techniques for teaching gifted and talented students as teachers become facilitators of learning. Many of the adult learning theories and practices can also be utilised and implemented in the specialised training of teachers in gifted education.

3.4 TEACHING SKILLS, STRATEGIES, TECHNIQUES AND COMPETENCIES

"...teacher competencies are modifiable aspects of human behaviour" (Feldhusen, 1985, p. 87).

It is logical that the skills required to be a successful teacher should be gained during a teacher's pre-service training program (Feldhusen, 1985; Rogers, 1989). Much of the research on general teacher training supports this logic, yet the research on teaching skills and competencies for teachers of the gifted student is not abundant (Hansen, 1988; Hansen & Feldhusen, 1994). In fact, there are few research studies to demonstrate that competency in a teaching skill for gifted and talented students is associated with specialised teacher training programs.

(Hansen, 1988; Hansen & Feldhusen, 1994; Rogers, 1989). It was the understanding of Whitlock and DuCette (1989) that experts in gifted education believed that a set of teaching skills could be listed to specifically characterise the teacher of the gifted. To this end, the present study can provide such research into the demonstration of a competency in the teaching skills required to effectively teach gifted and talented students is acquired through specialised teacher training programs in gifted education.

A detailed review of the teacher training models, practices and teacher professional development is located in section 3.5 of this Chapter. It was challenging to separate the research literature dealing with teaching skills, strategies and techniques from the teacher training literature, although the writer felt it was important to review the competencies that are associated with effective teaching skills and then to review the available training and professional development practices used in specialised training of teachers of the gifted. Many research studies (e.g. Bishop, 1968; Feldhusen, 1985; Hultgren & Seeley, 1982; Maker, 1975; Witty, 1950) have detailed desirable teacher characteristics, teacher behaviours, teaching skills and competencies which have led to the development of specially designed teacher training programs in gifted education. According to the research findings, some of the teacher training programs are designed in response to comparative studies looking at the expert and novice teacher of gifted and talented students (e.g. Silverman, 1980; Starko & Schack, 1989). A discussion of the literature concerning the expert and novice teacher follows in section 3.6 of this literature review.

Gifted education is a different educational culture to regular classroom teaching and the competencies required reflect clear differences between instruction required for one group and the other. The present study measured teaching skills of those *trained*, *untrained* and *undertaking training* in an attempt to determine if the competency was gained 'on the job' or as a result of the training. It was, therefore, important to initially identify successful teaching skills, strategies, techniques and competencies before making the connection to specialised teacher training programs for teachers of gifted students.

Maker's (1975) synthesis of the literature directed future research toward teaching skills (which instructional skills are used in the classroom) and competencies (a measurable outcome of the teaching skill used to promote learning) and away from almost 30 years of research on teacher characteristics (natural abilities or observable behaviours). The identified 'exiting' teacher knowledge and attitudes, and teaching skills required by teachers of the gifted and cited by Maker (1975) include:

- 1) extensive knowledge of the subject being taught and of other related fields
- 2) understanding of human development
- 3) skill in developing a flexible, individualised curriculum
- 4) demonstrated innovative approaches to teaching
- 5) utilisation of teaching strategies that engage children in higher orders of intellectual activity
- 6) student centeredness
- 7) demonstrated teaching ability in the regular classroom
- 8) ability to admit mistakes
- 9) willingness to be a guide rather than a director

These identified 'exiting' teacher knowledge and attitudes, and teaching skills cited by Maker (1975) were determined by a review of the research prior to 1975 and indicated the most often listed teacher knowledge, attitudes and teaching skills required by teachers of the gifted.

A set of 10 identified teaching strategies were chosen from the research literature on teaching skills and competencies for use with gifted and talented students in a research study conducted by Starko and Schack (1989) to investigate how effectively teachers used the selected strategies to meet the needs of the gifted student in the classroom. The sample included 176 pre-service teachers; 85 regular classroom teachers and 57 teachers of the gifted. The strategies included: acceleration, independent study centered around the students' interest; research based on a curriculum unit; curriculum units incorporating higher level thinking skills; eliminating assignments for mastered material; grouping for instruction; creativity training; alternate texts and simulations (Starko & Schack, 1989). It was reported that teachers (n=318) were more likely to use teaching strategies if they had confidence in the strategy. The research findings noted that the teacher's perception of the strategy's importance (and the actual use of the strategy) increased with specific experienced-based practice with the gifted classes (Starko & Schack, 1989). That is, the teachers who were teaching gifted students used the teaching skill more often than the other two groups and were more confident using the strategy because they had a perceived need for the teaching strategy. Therefore, this study found that using teaching skills and strategies that have been successfully tested to meet individual needs of the gifted student promotes learning and produces effective teaching. This study is significant in that the teaching skills

identified were tested for 'self-efficacy' (confidence), 'perceived need' and 'use' with gifted students, however, there was no identification of the teachers specific training in gifted education. The conclusion of the study was that self-efficacy (confidence) can be raised when the teaching skill is used with gifted and talented students. This confidence can be enhanced through practice using the teaching skill and through the observation of an expert 'modelling' the teaching skill deemed as successful.

As detailed in the section of the literature review discussing teacher characteristics, Witty (1950) investigated students' impressions of what type of person should teach gifted and talented students. From these responses, Witty (1950) detailed the following teacher competencies (early identification of gifted children and strength in a content area). These early investigations by Witty (1950) produced some very solid foundations for other research studies (e.g. Hultgren & Seeley, 1982; Seeley, 1979; Wyatt, 1982) in the identification of successful teaching skills for use with gifted students.

The teaching competencies of effective teachers of gifted students described by Lindsay (1980) supported the findings by the early research studies of Maker, (1975) and Witty (1950) and include: the ability to develop flexible, individualised programs; to guide students in their learning; to employ democratic procedures rather than autocratic ones; to engage the students in the process as well as the product; to be innovative rather than confronting; to utilise problem-solving procedures and to encourage discovery rather than giving the answers to students. This concise list highlighted the need for the successful teacher of the gifted to modify the instructional content and process to meet the students' individual needs.

Wyatt (1982) looked at the teaching skills that teachers (n=54) thought were effective techniques in teaching the gifted. A questionnaire was developed and distributed to conference delegates at the Kansas Association for the Gifted conference. Although there were only 54 respondents, the qualitative data collected showed some very strong results and the following list of teacher competencies was compiled. The respondents felt that teachers of the gifted should:

- 1) provide an enriched classroom environment
- 2) provide differentiated instruction
- 3) involve students in independent study
- 4) teach high level thinking and research skills
- 5) provide options to accommodate learning styles
- 6) be knowledgeable about gifted children
- 7) employ appropriate teaching methods for the gifted

The conclusions by Wyatt (1982) mirrored the suggested competencies by Witty (1950) and, thus, there is consensus between these two research studies on teaching competencies of effective teachers of the gifted.

Hultgren and Seeley (1982) conducted a national survey in the United States to determine perceived competencies needed by teachers to be successful and effective teachers of the gifted. Both university personnel and classroom practitioners (n=668) participated in the study and there was a high level of agreement between the two groups on the first ten competencies with a list of 24 competencies established. The ten competencies agreed upon are as follows:

- 1) knowledge of nature and need of gifted students
- 2) ability to develop methods and materials for use with gifted students
- 3) skill in promoting higher-level thinking abilities and questioning techniques
- 4) supervised practical experience teaching a group of gifted students
- 5) knowledge of affective/psychological needs of gifted students
- 6) skill in facilitating independent research and study skills
- 7) ability to develop creative problem solving skills
- 8) knowledge of approaches to extension and enrichment of subject areas
- 9) ability to construct and/or utilise identification procedures
- 10) knowledge of special affective and cognitive needs of the gifted underachiever

This comprehensive list was used to determine goals of specialised teacher training programs in gifted education as it was highly regarded by other researchers (e.g. Feldhusen, 1985; Gallagher, 1985).

Gallagher (1985) synthesised the work of Hultgren and Seeley (1982) in an attempt to demonstrate a link between desirable teacher characteristics, necessary teaching skills and competencies and how these, in combination, could be used to prepare school personnel appropriately to meet the needs of the gifted child in the classroom. It was suggested that a test be designed to measure the existing teaching skills and competencies of teachers before developing the appropriate specialised teacher training (Gallagher, 1985). He proposed the following teaching competencies that were identifiable as particularly successful in teaching gifted and talented students: the development of question asking strategies that stimulate

productive thinking; the ability to organise and monitor independent study programs; the ability to teach high-level conceptual ideas and systems and teaching students the skills of inquiry (Gallagher, 1985). As gifted children can appear intimidating to teachers, Gallagher (1985) also proposes that teachers should develop the skill of feeling adequate rather than inadequate in the presence of the gifted student. Gallagher (2000) proposed that the specialist teacher of the gifted needs to learn the skills required to differentiate the curriculum material for gifted students and to present complex ideas and concepts. He suggested that the specialist teacher also needs extensive knowledge of the various ways to access information to assist the student with research; is able to promote higher level thinking in the students and be able to act as mentor for extraordinary students (Gallagher, 2000).

Feldhusen and Hansen (1987) concluded from their experience in selecting and training teachers to teach on the Purdue University 'Super Saturday Program' that the desired competencies of the teacher of the gifted can be taught. They proposed that teachers who wanted to teach on the Purdue Super Saturday Program (an enrichment program for gifted and talented students held on a Saturday for nine weeks in Spring and Autumn and also intensively for two weeks during Summer) should first meet teaching skill and competency requirements on a checklist before being invited to teach. The checklist was designed to heighten the awareness of what was expected of the teacher on the Super Saturday Program and to establish some guidelines for a defensible teacher selection process (Feldhusen & Hansen, 1987). The teacher checklist included the following criteria: intelligent and knowledgeable in general; willing to work extra hard; well organised; excited about the opportunity to work with gifted and talented students; accepting

of the diverse behaviours of gifted students; flexible and creative in designing methods and materials of instruction (Feldhusen & Hansen, 1987). If the teacher could meet the criteria on the checklist they were invited to attend a special half-day training program in addition to their normal M.Ed. (specialising in gifted education) teacher training program requirements. The half-day training program was designed to ensure that the teacher had the following teaching skills and competencies: understanding of the gifted student and their affective development; skill in individual and group instruction; problem-solving and development of higher level and creative thinking abilities (Feldhusen & Hansen, 1987). It was concluded that the desired teaching skills and competencies can be taught and that specialised training enhances the learning of these teaching skills and competencies (Feldhusen & Hansen, 1987).

Many research studies (e.g. Feldhusen, 1985, Feldhusen & Hansen, 1987; Gallagher, 1985; Hansen, 1988; Hultgren & Seeley, 1982; Maker, 1975) that have investigated the teaching skills and competencies required to teach gifted and talented children, have included in their list 'higher level thinking'. The higher level thinking skills commonly reflect analysis, synthesis and evaluation which are the three highest cognitive levels of Blooms Taxonomy - a detailed taxonomy of cognitive processes developed over 40 years ago by Bloom, Engelhart, Furst, Hill, and Krathwohl (1956). Bloom's Taxonomy is concerned with six different levels of cognitive activity that is categorised in a hierarchical form: lowest to highest. The lowest level of thinking or cognition is knowledge and is followed by comprehension, application, analysis, synthesis and finally, evaluation. It is a widely used cognitive hierarchy accepted by professionals in the field of education and educational psychology.

Research by Solman and Rosen (1986) found that teaching students at the evaluation and synthesis level of operation (Bloom et al. 1956) facilitated student learning and higher levels of student achievement were noted. The study involved two experiments; the first investigated secondary school students (n=264) in Years 9 and 11 in Sydney (Australia) high schools with the sample divided into six equal groups of 44 to test the taxonomic levels according to Bloom et al, (1956). It was found that the number of tasks completed correctly by students declined as the tasks became more complex and required the student to operate at a higher of cognitive level. The results were analysed in relation to working memory (termed an 'adjusted incidental memory score') and it was reported that the students working at the synthesis and evaluation level of cognition were able to retain the information in their working memory in a more significant manner than those who were working at the knowledge or comprehension level (Solman & Rosen, 1986). This study is supportive of the teaching of gifted students at a higher level of cognition as the results concluded that information is learnt in a more effective way with the knowledge stored in working memory available for easy retrieval. Emphasis on higher level thinking, using Bloom's Taxonomy, as evidenced in the teacher's questioning and determining of activities and tasks, is a necessary teaching competency listed by the research findings.

Rogers (1986) critically reviewed the gifted education literature from 1975-1985 looking for evidence of the gifted and talented child thinking and learning differently, using differing cognitive styles, developmental patterns, cognitive strategy selection and the effect this had on their social and emotional needs. She concluded that the gifted child does have different cognitive styles and patterns of

learning, although the differences are probably ones of degrees. Hence, there is a need for teachers of the gifted to modify the instructional strategies in the classroom to appropriately meet the needs that the differences in cognitive styles and patterns of learning may create (Rogers, 1986). This conclusion by Rogers (1986) supports the findings of previous researchers who reviewed the literature to determine effective teaching skills and strategies appropriate for gifted students (e.g. Feldhusen & Hansen, 1987; Gallagher, 1985; Hultgren & Seeley, 1982; Maker, 1975).

Outstanding (n=10) and average (n=10) teachers of the gifted were interviewed in a study by Whitlock and DuCette (1989) to obtain a list of teacher competencies required for successful teaching of gifted and talented students. The model designed as a result of their study was new to educational research in that it adopted behaviour indicators that were traditionally used in industry and not in the assessment of teaching. The participants (n=20) were interviewed and asked to recount details of their actions, thoughts and feelings from their teaching experiences (Whitlock & DuCette, 1989). A competency model of the outstanding teachers of the gifted was developed and included 12 competencies and behaviour indicators. The work of Whitlock and DuCette (1989) supported the Seeley and Hultgren (1982) study by identifying many similar teacher competencies. The 12 competencies included in the model are: enthusiasm; personal flexibility; self-confidence; empathy; openness; facilitative role; ability to motivate students; build program support; advocacy; applying knowledge; achievement orientation and commitment. When comparing outstanding to average teachers of the gifted it was found that the difference between the two groups were on the first six listed competencies. That is, the outstanding teachers showed enthusiasm; self-

confidence; facilitator role; application and knowledge; achievement orientation and commitment. The competencies identified read more like a list of teacher characteristics and only when matched with the behavioural descriptions do the competencies take more of a teaching skills identity (Whitlock & DuCette, 1989) .

The skill of differentiated education for individual needs was the emphasis of the study by Whitton (1997) when she surveyed 606 Year 3 and 4 teachers in eastern Australian primary schools to assess the degree to which teachers modify curriculum content and instructional practices to meet the needs of the gifted and talented student in the regular classroom. The finding of this Australian study showed that teachers had little understanding of the special requirements of differentiated education for gifted and talented students and that very little differentiation was going on. In fact, there appeared only minor differences in modification to curriculum between the gifted and the average students. Whitton (1997) noted that one reason for this might have been that only a small percentage of teachers who participated in the study had undertaken specialised training in gifted education. The results of this study highlight the need for specialised training so that those teachers can appropriately provide for the gifted and talented students in their classroom.

Wellisch (1997) surveyed early childhood practices in gifted education in Australia. Although she did examine the training of teachers as such, it is interesting to note that she found early childhood educators were already catering to the individual's needs and curriculum differentiation was occurring through individual programming for young children demonstrating characteristics of giftedness. Early childhood teachers were engaged in identifying children's strengths (especially in language,

music and creativity) and then programming appropriately for the individual's needs at pre-school.

An emphasis on creativity often appears on lists of teaching skills and competencies (Gallagher, 1985; Hansen, 1988; Hultgren & Seeley, 1982). Emphasis on creativity in teaching the content, process and product is an important teaching skill as teachers of the gifted need to assist students with independent research and problem solving. Rejskind, (2000) categorises creativity as productive, expressive and inventive. As teachers of the gifted and talented students work with individual needs, gifts and talents, the teacher must engage in varied and extensive planning of their teaching and this, in itself, requires an amount of productive and inventive creativity (Rejskind, 2000). The manner in which these specialist teachers of gifted students encourage students to express their own self through their learning is an example of developing expressive creativity (Rejskind, 2000).

Six contemporary leaders in the field of gifted education (James Gallagher, Sandra Kaplan, Sally Reis, Joseph Renzulli, Joyce VanTassel-Baska and Carol Tomlinson) were asked three questions regarding their thoughts about the directions of gifted education into the new millennium (Rizza & Gentry, 2001). One question asked was "If you could identify the core non-negotiables...what knowledge and skills ought all teachers have concerning the education of gifted and talented students?" (Rizza & Gentry, 2001, p.167). The study is a report of qualitative data using an informal review of identifying key issues in the responses through editing and categorising the responses into themes (selected by the researchers) to provide the reader with an organised view of data. The central

issue that arose from the question stated above was that teachers should employ teaching strategies that: accommodate the individual; motivate and provide opportunities; develop talent; differentiate the depth and pace and offer challenging content and promote higher-level thinking (Rizza & Gentry, 2001). The competencies identified were: act as a 'model' to the gifted; be passionate and interested and 'love' learning; caring of both the individual and the learning; sensitive and a competent thinker (Rizza & Gentry, 2001).

The teacher of the gifted really does have a responsibility far greater than can be summarised in a list of teaching skills and competencies. Keirouz (1993) encouraged teachers to teach students to think and to apply their thinking in important areas of human endeavour. Teachers should be able to: encourage higher-level thinking; differentiate their teaching material appropriately to meet the needs of the gifted child and obtain an 'optimal match' between students' ability and educational challenge (Keirouz, 1993). She contributed to the list of teaching competencies by describing how the teacher of the gifted student can provide more in-depth learning experiences through a greater depth and pace of the curriculum and through searching for the 'optimal match' between student and curriculum (Keirouz, 1993).

Kanevsky (1995) describes the students' learning potential as one that needs to be appropriately cultivated in an environment that promotes learning with the individual's needs as the focus to "achieve a match between the nature of the learner and the nature of the learning experiences" (p. 157). The gifted student may develop their own learning strategies but the teacher must remain the facilitator of the learning and strive to understand how to match the needs to the

desired range of instructional options available. Kanevsky (1992) found that the child's interest in an area of study impacts on their learning and so the teacher needs to provide a range of learning experiences. The concept of matching the child's individual needs to the learning experience was identified by Keirouz (1993) is supported by Kanevsky (1995). One of the factors that the present study sought to determine was whether a variety of learning experiences were offered to gifted students by those teachers *trained*, *undertaking training* and *untrained* in gifted education.

The National Research Centre for Gifted and Talented Children in the United States commissioned a research study that examined 10 schools which had demonstrated exemplary practices in meeting the needs of the gifted and talented student. It was noted that the effective teachers in these 10 schools displayed trust in the students to work independently; were spontaneous in their teaching practices and often exchanged teaching ideas and concepts with their network of gifted education colleagues (Westberg, 1994). This concise list of competencies encapsulated the skills required of the teacher of gifted and talented students and concurs with earlier research by Gallagher (1985), Feldhusen and Hansen (1987), Hultgren and Seeley (1982), Maker (1975), Rizza and Gentry (2001), Whitlocke and DuCette (1989) and Wyatt (1982).

SUMMARY

The extensive lists of teaching skills, strategies and competencies proposed by Feldhusen (1985), Feldhusen and Hansen (1987), Gallagher (1985), Hultgren and Seeley (1982), Maker (1975), Rizza and Gentry (2001), Starko and Schack (1989), Whitlocke and DuCette (1989) and Wyatt (1982) have many commonalities.

They include:

Knowledge of gifted students and their needs

Promoting higher level thinking and questioning techniques

Excellent subject knowledge

Differentiated instruction

Involving students in independent study

Curriculum modification strategies

Flexible and creative in designing methods and materials

Items designed to assess the above mentioned teaching skills, strategies and techniques were included in the instrument used in the present study (*The Teacher Observation Form*) to measure observable teaching skills of *trained, untrained* and *trainee* teachers of the gifted.

The strength found in this section of the literature lies in the fact that many of the lists of teaching skills, strategies, techniques and competencies identified by the research literature (e.g. Gallagher, 1985; Feldhusen, 1985; Feldhusen & Hansen, 1987; Maker, 1975) have been gathered from a review of literature on the subject. This means that the extensive lists appear to be repetitious of each other.

Those researchers who have investigated this area through experimental research (e.g. Hultgren & Seeley, 1982; Rizza & Gentry, 2001; Solman & Rosen, 1986; Starko & Schack, 1989; Whitlocke & DuCette, 1989; Whitton, 1997; Wyatt, 1982) contribute validity to the area of understanding of the teaching skills and competencies required to teach gifted and talented children.

Many research studies (e.g. Feldhusen, 1985, Gallagher, 1985; Hultgren & Seeley, 1982; Maker, 1975; Rizza & Gentry, 2001; Starko & Schack, 1989; Whitlocke & DuCette, 1989; Wyatt, 1982) that have investigated the teaching skills and competencies required to teach gifted and talented children, have highlighted 'higher level thinking' in their findings. Solman and Rosen's (1989) study was a strong study that, whilst not investigating gifted students only, provided evidence of this very necessary teaching skill. Teachers of gifted students require the teaching skills, strategies, techniques and competencies listed here as the gifted student has advanced cognitive development needing specialised attention. Without the appropriate educational instruction and environment, the gifted student may underachieve, drop-out or become a behaviour problem in the classroom.

Feldhusen (1985) advocated that the extensive lists of teaching skills and competencies identified by the many research studies in the field of gifted education provide the goals of teacher training and inservice professional development programs for the current and future teachers of gifted and talented students. Teacher educators can develop methods that demonstrate the teaching skills and behaviours required to be an effective teacher of the gifted. Therefore, this section of the literature review on teaching skills, strategies, techniques and competencies has shown that the identified teaching skills and competencies can be learned through specialised teacher training in gifted education. The issues surrounding specialised teacher training in gifted education will be explored in the next section of the literature review.

3.5 TEACHER TRAINING AND PROFESSIONAL DEVELOPMENT IN GIFTED EDUCATION: MODELS AND PRACTICES

"... training of teachers is necessary in order to identify and serve the gifted student effectively" (Tomlinson, 1986, p. 112).

The development of specialised teacher training programs in gifted education over the last quarter century has meant that there exists a potential for thousands of professionally prepared teachers to be responsible for teaching gifted students. The development of these specialised teacher training models in gifted education has been described in the existing research literature (e.g. Feldhusen & Huffman, 1988, Gross, 1997; Hanninen, 1988; Sullenger, Cashion & Ball, 1997). The focus on specialised teacher education and the professional development of teachers (at both pre-service and inservice level) has had a positive impact on the understanding of this specialised group of students in our schools (Gross 1994c; Hansen & Feldhusen, 1994; Robinson, 1985; Rogers, 1989; Silverman, 1988; Sullenger et al., 1997; Tomlinson, 1986).

Unfortunately, those responsible for the appropriate placement of teachers with this group of students have not always realised the importance of specialised teacher training in gifted education. Specialised training of teachers in gifted education is essential to enable the teachers to be more effective in providing for the gifted students in the classroom. The following review of the literature on teacher training, professional development and teacher inservice programs utilises the reviewed desirable teacher characteristics of successful teachers of the gifted together with stated teaching skills and competencies required for teachers to

effectively meet the needs of the gifted student. It is apparent that many of the research findings (e.g. Feldhusen, 1985; Gallagher, 1985; Maker, 1975) were utilised in the development of the specialised teacher training models and programs.

Seeley, Jenkins and Hultgren's (1981) research had a single purpose that was to propose standards for training programs in gifted education. These standards were specifically for adoption by the National Association for Gifted Children in the United States. Each standard was a proposed recommendation after six months' work by a designated task force involving the professional training committee of the National Association for Gifted Children and the Teacher Education Committee. No data were collected to substantiate the list of standards for teachers of the gifted and it was proposed that the list of standards included the following: specific admission criteria for those wanting to teach gifted students; degree programs at post-graduate level; curriculum and skill competency demonstrated by teachers in areas including identification, curriculum models, teaching strategies, program development; review of the training program and adequate resources to implement the training. These standards incorporate the outcomes of the previously detailed teaching skills, strategies, techniques and competencies.

Studies relating to teaching skills and competencies provide appropriate goals that can be used for inservice and other specialised teacher training programs (Feldhusen 1985). It was Gallagher's (1985) proposal that the identified desirable teaching skills and competencies should be used to continue training personnel in gifted education. He proposed that many of the two million existing teaching personnel in the United States could profit from additional and specialised training

and professional development to assist teachers to work more effectively with the gifted and talented students. Gallagher (1985) also noted that leadership programs could prepare administrators and teacher trainers to carry out the task of continuing the development of the practising teacher of the gifted student. The goals suggested for the professional development training programs were: special knowledge of the needs of gifted students; understanding of how to stimulate productive thinking; an understanding of how the school can adapt to meet the needs of the gifted student and to provide the auxiliary service (for example, curriculum and counselling) and teaching practicum experiences in special programs for the gifted (Gallagher, 1985).

The goals of teacher training programs, therefore, should include an outcome to create facilitators of learning (Cross & Dobbs 1987). The opportunity to practise the teaching skills learned during the specialised teacher training programs can give the teacher-in-training an opportunity to demonstrate competencies essential for facilitating effective teaching for the gifted and talented student (Feldhusen & Huffman, 1988). In a well designed teacher training program for *trainee* teachers of gifted students, Feldhusen and Huffman (1988) evaluated the practicum teaching of 209 teachers through observing and rating teaching skills. The students found the combination of practicum experience, a written evaluation and the completion of a reflective practicum journal was effective in preparing them as specialised teachers of gifted and talented students (Feldhusen & Huffman, 1988).

Many teacher training programs list competencies as outcomes for the program. More specifically, the literature focuses on the competencies set by tertiary institutions that offer specialised teacher training courses in gifted education. Sisk

(1975) listed 12 skills and competencies as objectives of the specialised teacher training program at the University of South Florida. The list included skills in: utilising tests and test data; counselling and guidance; developing lessons in creative thinking; providing learning opportunities at all levels of cognition and understanding the nature and needs of the gifted student. Sisk (1975) along with Feldhusen (1985) detailed lists of teaching skills and competencies as the objectives of the specialised teacher training in gifted education.

Feldhusen's (1985) synthesis of the literature validated and strengthened the lists of teaching skills and competencies for teachers of the gifted that already existed. As previously mentioned, Feldhusen (1985) concluded that teachers of gifted and talented students could be trained to become effective teachers through specialised teacher training programs and that the extensive lists of teaching skills and competencies that existed could, in fact, be the goals of teacher education programs in the preparation of teachers to teach gifted and talented children. This dictum by Feldhusen (1985) indicated that the research previously noted on teaching skills and competencies could substantiate the program goals as effective.

The training of teachers in tertiary institutions to become successful teachers of the gifted has long been a topic for discussion amongst the experts in gifted education. Rogers (1989) proposed the need to assess the background and personal attributes of the teacher before they commence training. She suggested that included in the teacher education program should be training in 'how to think differently' and 'learning how to learn'. After all, as educators, the primary goal is to

meet the specific needs and problems associated with the differences in educating the gifted learner in the classroom.

Maker (1975) also noted that the teacher education programs should be designed to eliminate some of the less desirable 'entering' teacher characteristics of the trainee teachers and perhaps the identified, desirable teacher characteristics could be used for selecting teachers into the specialised teacher training programs. This is similar to Feldhusen and Hansen's (1987) proposal of a teacher checklist of skills and competencies used to select teachers for the Super Saturday Program at Purdue. Many of the teacher characteristics identified by the researchers (e.g. Bishop, 1968; Hultgren & Seeley, 1982; Witty, 1950) could be interpreted as 'exiting' competencies learned during the specialised teacher training (Maker, 1975). Some of these desirable 'exiting' competencies (specifically aimed at teachers of the intellectually gifted students) as listed by Maker (1975) include:

- 1) general intellectual abilities and specific academic aptitude
- 2) skill in and willingness to utilise questioning techniques and teaching methods that develop higher thought processes in gifted students
- 3) extensive knowledge of basic concepts in the subject being taught as well as related fields
- 4) knowledge of the media and materials particularly useful in his/her area of teaching

In response to Maker's (1975) research, Seeley (1979) carried out a survey in Colorado to assess competencies for training teachers of gifted students. It was his objective to develop competencies for those teaching gifted and talented

students and to provide assistance in the examination criteria for teacher training, teacher selection, staff development and certification purposes. Each college and university whose training program was listed with the National State Leadership Training Institute was invited to participate in the survey. Seeley's (1979) research provided a 93% consensus amongst the group surveyed regarding the competencies for teachers of gifted students. Although it was not a large sample ($n=30$), twenty-one competency areas were identified as necessary goals of the teacher training program and following are the five that rated the highest: higher cognitive teaching; curriculum modification strategies; special curriculum development strategies; diagnostic/prescriptive teaching skills and student counselling strategies (Seeley, 1979). The first four competencies are closely related to the teaching skills measured by the instrument (*Teacher Observation Form*) in the present study.

Johnson and Gentry (2000) proposed that teachers should be admitted into the post-graduate training programs in gifted education similarly to the admission criteria for gifted students to specialised programs in an attempt to practise what the gifted education experts preach. The prospective trainee teacher should, therefore, display intelligence, creativity and giftedness by way of a performance and portfolio assessment (Johnson & Gentry, 2000). Roger's (1989) and Johnson and Gentry's (2000) proposal of a criteria for admission to the teacher education program supports Maker's (1975) and Feldhusen and Hansen's (1987) proposals.

In support of this concept, Robinson (1985) described the effectiveness of a Summer Institute at Western Illinois University where trainee teachers in gifted education ($n=17$) were taught via a compacted curriculum of teacher education.

The program's content was an introductory post-graduate program in teaching gifted and talented children. The institute's innovative approach (that is, compacting the curriculum) made use of the identified effective teaching skills for teaching gifted learners in this specialised teacher training program. The participants were assessed through a pre-test and post-test situational analysis on their performance in the courses offered. The results of this training methodology supported its effectiveness in training teachers to teach gifted students (Robinson, 1985).

Another successful teacher education initiative was a Summer Institute in Canada, where the goals of the institute were to introduce teachers to gifted learners (through a critical review of the theory and practice of how gifted students learn) and to involve the participants in a method of adult learning that required a culture of sharing and learning (Sullenger et al., 1997). The study required participants (n=50) to complete a questionnaire at the conclusion of the institute commenting on whether the training program met the desired goals as set. Only 25 participants completed the questionnaire and the results concluded that the teacher education program was successful in meeting the set outcomes.

A longitudinal study of the participants was conducted two years after the institute to determine how successfully the trained teachers had adopted teaching skills and strategies taught in the institute and if they had altered their teaching style in accordance with the knowledge and content presented in the institute (Cashion & Sullenger, 2000). Teachers reported (no sample size is provided in the article) that they did change their beliefs about gifted learners and also changed their classroom practices. One of the weaknesses of this follow-up study is that no

sample size is mentioned of the original 25 who completed the questionnaire and, as the responses were anonymous, it is not known if these respondents were the same respondents who answered at the conclusion of the institute. This study is, however, supportive of the effect specialised training in gifted education can have on developing 'exiting' teacher characteristics (Maker, 1975) and teaching competencies determined as successful in facilitating learning for the gifted.

A study of teachers (n=146) *untrained* in gifted education found that, even after training in the instructional needs of students, these teachers were reluctant to change their beliefs (Tillema, 1995). However, when teachers engaged in inservice training were given information about students' learning needs, they were much more open to changing their perceptions. This study, in fact, showed that the acquisition of new knowledge needs to be accompanied by a change in beliefs if it is to result in changes in practice (Tillema, 1995). This finding is supported by a study that investigated the teacher's ability to enhance student learning of moral behaviours (Rostan, Rudnitski & Grisanti, 2001). They posited that if the teacher's beliefs and knowledge are at the core of all that happened in the classroom, then the teacher should be able to foster and facilitate the moral behaviour in the classroom through the activities planned. The teacher must be trained in the understanding of such behaviours and be given the knowledge so that their own beliefs can be challenged and directed in order to assist student understanding of altruistic and helping behaviors (Rostan et al., 20001). Such specialised teacher training as is required for this sort of teacher development must be directed specifically toward an understanding of the gifted student's emotional, social and intellectual needs.

Steele (1995) proposed nine strategies for improving the quality of student learning in undergraduate education. The following strategies are pertinent to the improvement of educational effectiveness (Steele, 1995):

- 1) encourage independent learning to give students control over their choice of content, learning method and pace
- 2) support personal development by encouraging the affective as well as cognitive facets in their learning
- 3) present problems; that require an application and synthesis of previous knowledge from other disciplines
- 4) encourage reflection by using learning diaries and reflective journals
- 5) use independent and group work
- 6) learning by doing including experiential learning, role-plays
- 7) develop learning skills through flexibility and student awareness of the demands of the task
- 8) set projects
- 9) explore radical alternatives

This comprehensive list of strategies to improve teacher education programs can be used by academic directors of specialised teacher training programs in gifted education, at the tertiary level, to ensure that the trainee teachers are exposed to a variety of learning experiences.

Training teachers to emphasise higher level thinking skills in the classroom, to implement higher level questioning for the gifted and talented and to differentiate their curriculum according to the six cognitive processes (Bloom et al, 1956) is a

goal of many teacher training courses specialising in gifted and talented education. Teacher education and professional development for those teachers responsible for the teaching of gifted students often includes an introduction to Bloom's taxonomy (Bloom et al, 1956) and its operation in the classroom. Students' learning is more successful if teachers are trained to facilitate student learning through the use of higher-level thinking activities (Solman & Rosen, 1986).

As stated previously, the present study used a similar methodology to that employed in the Hansen (1988) study of 19 *untrained* and 54 *trained* teachers of gifted students in Indiana measuring the effectiveness of teacher training and how it correlated with observable teaching skills and classroom climate. Hansen (1988) found that the specially *trained* teacher of the gifted demonstrated more appropriate teaching skills for gifted children than the *untrained* teachers. Hansen (1988) concluded from her study of untrained and trained teachers of gifted students in Indiana that specialised training in gifted education is an influential variable that accounts for more effective teaching skills and develops more positive classroom climates in teachers who are trained. Hansen (1988) found that the success of an educational program in a school depends on the teacher, and the effectiveness of the teacher depends on the specialised teacher training program.

Hanninen's (1988) study was specifically designed to determine whether specialised training in gifted education made a difference to gifted students. In an analysis of responses to five selected scenarios involving gifted and talented students by teachers *trained* in gifted education (n=5), those *not trained* in gifted education (n=5) and *trainee* teachers (n=5), Hanninen (1988) concluded that there was a notable difference between the teaching skills and competencies of the

specially *trained* teacher of gifted students. The teaching competencies demonstrated by those specially trained in gifted education were: use broader theoretical and pedagogical bases to facilitate instruction; emphasis on individualised teaching methodology; focus on broader out-of-class resources; expanded students interest outside the normal curriculum and linked non-academic and academic topics more often (Hanninen, 1988). This list of teacher competencies supported other research findings (e.g. Hansen, 1988; Hansen & Feldhusen, 1994). Hanninen (1988) concluded that there was a notable difference between the *trained* and *untrained* teacher of gifted students and that those specially *trained* in gifted education used broader theoretical and pedagogical bases to facilitate instruction and placed more emphasis on individualised teaching methodology. She further noted that the teacher skills and strategies identified in her study could be integrated into teacher training programs and could, perhaps, be used in formulating the objectives of the teacher training program for teachers of the gifted student (Hanninen, 1988).

Hansen and Feldhusen's (1994) comparison study of teachers *trained* and teachers *untrained* in gifted education, the effectiveness of the teacher training was reported. It was concluded that the teachers who had specialised training in gifted education were more effective than those who did not receive training (Hansen & Feldhusen, 1994). Hansen and Feldhusen (1994) compared *trained* (n=54) and *untrained* (n=28) teachers of gifted students to assess the effectiveness of the teacher training in teaching skills and classroom climate. This study demonstrated that the teachers who had specialised training in gifted education demonstrated the following teaching skills and competencies: foster in-depth study of topics and student self-direction; concept-based approach to subject matter with clear

explanation and presentation; well paced instruction with an avoidance of repetition, drill and examples; energy and enthusiasm; allowance for self-determination of activities by the student; provision of a variety of learning experiences; foster high level thinking and promotion of critical thinking; emphasis on creativity and encourage risk taking; clear and differentiated objectives and selection and utilising appropriate instructional materials. The results of this research contributed to the perspective noted by Feldhusen (1985) that teacher competencies and teaching skills can be learned and that specialised training in gifted education impacts significantly on the display of those skills and competencies. The results of the Hansen and Feldhusen (1994) study supported the need for specialised teacher training programs in gifted education and teacher professional development. In the comparisons of teachers specially *trained* and those *not trained* (Hanninen, 1988; Hansen, 1988; Hansen & Feldhusen, 1994) it is apparent that specialised teacher training does make a difference to the effectiveness of the teaching.

Robards (1983) stated that gifted education leaders must be serious about teacher education as it is the only way to ensure that gifted students receive the appropriate program and provision for a challenging education. As previously mentioned, Starko and Schack (1989) recommended that pre-service teacher preparation courses should attempt to set outcomes that included the development of the teachers confidence in the use of specific teaching strategies. The confidence in using a strategy can be practiced through proven teacher education strategies such as micro-teaching, observation of a modelled skill by an expert, simulated practicums and mock teaching segments during the teacher training program.

Persson, Joswig, and Balogh (2000) reviewed teacher training practices in Europe and found that amongst the 24 countries surveyed, there were no fewer than 17 that offered some form of specialised professional development programs for gifted education - either through local education departments or in tertiary institutions. The range of offerings was enormous with some countries offering no special professional development program in gifted education (for example Poland, Croatia); some basic, non systematic pre-service education to post-graduates (for example Bulgaria, Romania) and other countries, such as The Netherlands and Hungary, offering practising teachers the opportunity to study a range of specially designed tertiary level courses in gifted education towards the European Advanced Diploma in Education of the Gifted (Persson et al., 2000). Some of the European countries experience the same difficulties as other countries around the world regarding issues related to the training of teachers in gifted education. It was reported that much is yet to happen in Europe but there is growing support for teaching training in gifted education (Persson et al., 2000).

Gross (1997) measured shifts in the attitudes toward the knowledge of gifted and talented students of practising teachers (n=70) before and after training and teachers (n=78) attending a full-day inservice professional development session. In this instance, training was defined as specialised degree programs at a post-graduate level, whilst inservice was defined as a short term program of professional development for teachers currently in service. The findings of this study showed significant changes in attitude toward gifted education after both training and inservicing. A dramatic change in attitude toward support for gifted education services and needs of the gifted was registered after the specialised

training in gifted education (Gross, 1997). The study also included a control group of teachers (n=147) who were not engaged in training and the results comparing the two groups showed a more positive attitude toward the gifted student by those who had chosen to undertake specialised training at post-graduate level. The study concluded, however, that both inservice professional development and specialised training at post-graduate level can have an impact on the attitude of the teacher and administrators in better meeting the needs of the gifted and talented student (Gross, 1997).

It should be again noted here that an Australian Senate inquiry into the education of the gifted children took place in 2001 and the report of that inquiry was released in October, 2001. The aim of the 2001 Senate Employment, Workplace Relations, Small Business and Education Committee (referred to as The Committee of Inquiry) was to follow-up the recommendations of a 1988 Senate select committee report on the education of gifted and talented children and to establish what progress had been made in implementing the 1988 recommendations of the Senate select committee. Amongst the 1988 Senate select committee's recommendations were that more effective training and inservicing of teachers in gifted education was to be available to meet the needs of the gifted and talented students. One response to this recommendation was the development and implementation of the Certificate of Gifted Education (COGE) and a wider range of specialised gifted education programs at post-graduate level by the University of New South Wales (UNSW). Another response to recommendations of the 1988 Senate select committee report was the introduction of the *NSW Strategy for the Education of Gifted and Talented Students* in 1991 by the NSW Department of School Education.

In 1991, the University of New South Wales responded to the aforementioned Government directive for more effective training and inservice in gifted education for Australian teachers by establishing a rigorous Certificate of Gifted Education. The program is led by Professor Miraca Gross and is facilitated by a team of nationally and internationally renowned experts in the education of gifted and talented children. This intensive training program is unique in Australia and attracts participants from across Australia, New Zealand and from Asia. The program consists of 75 hours face-to-face instruction and five academically rigorous assignments at post-graduate level cover aspects of identification, curricula development, programming and the social and emotional needs of academically gifted students.

In a survey of 197 school districts in Iowa which had programs in their schools for gifted and talented students, it was concluded that inservice education of teachers responsible for teaching gifted students would improve the effectiveness of the teacher (Breiter, 1989). Many of the teachers had, in fact, sought their own professional development away from the school as they were faced with the very real problem of having to meet the needs of the gifted child in the classroom with minimal specialised teacher training. This style of professional development showed an innovative, yet somewhat disparate measure to provide training for teachers of the gifted. More recently, Feldhusen and Jin (2000) have suggested the use of a pre-test (*The Gifted Education Knowledge Scale*) to assess the basic knowledge of the teacher before deciding the most appropriate professional development option to pursue.

According to Conners (1991), most of the literature regarding teacher professional development comes from North America. Conners (1991) listed research that has carried out a needs assessment showing inservice activities and teacher professional development should be based on needs identified by the teachers themselves. In fact, it was determined that when teachers identified their own professional development needs, the success rate of the inservicing increased. Conners (1991) concluded that the teachers want to be actively involved in deciding the individual professional development needs from the commencement of the planning process. It is clear that a needs-based approach to professional development for teachers of the gifted such as is suggested by Conners (1991), mirrors practices employed in assessing appropriate learning for the gifted student.

In an attempt to foster self-direction for teacher education in effective teaching practices for gifted students, Whitmore (1983) designed two self-evaluation instruments to assist both administrators and teachers in planning their own professional development by assessing the frequency with which particular classroom characteristics were observed. This system of professional development allowed the teacher to be self-directed but relied heavily on the accurate appraisal of the classroom observation. Raising awareness about the need for specialised teacher professional development in gifted education was a focus of the research as gifted education advocates attempted to implement teacher professional development in schools.

There is a range of expectations by the participants in professional development and teacher training situations that the provision will automatically meet the perceived needs and provide the participants with the skills necessary to change

as a result of the training. A survey of participant expectations (n=336) by Tomlinson (1986) demonstrated that the inservice should be tailored to the specific needs of the participants with expectations set in line with the proposed outcomes of the inservice. A needs assessment is useful in determining the training deemed necessary by the participants and in deciding what can be achieved in the inservice session. A national survey of 40 state and district Directors of Gifted and Talented was carried out by Cross and Dobbs (1987) to determine the degree of importance of topics listing concerns about the preparation of teachers to teach gifted and talented students. The survey results determined goals for teacher professional development programs and contained the following three elements: curriculum design and instructional strategies; needs and characteristics of the gifted student for the purposes of identification and methods of program and student evaluation (Cross & Dobbs, 1987). A needs assessment is very useful in determining the appropriate form of professional development required for teachers of gifted and talented students.

Teacher professional development relies on the ability of a teacher to change particular teaching strategies so more appropriate instructional strategies can be employed to improve the learning of the gifted and talented student. It is accepted, therefore, that teachers of gifted students require a differentiated form of professional development to match the characteristics of the teacher of the gifted and to incorporate teaching styles, strategies and skills for improved facilitation. The Concerns-Based Adoption Model (CBAM - outlined in Chapter Two) proposed that teacher professional development can be achieved by taking change on board and, as a result, a development and growth in teaching skills will occur (Roberts & Roberts, 1986). The CBAM is also effective in matching the concerns that

teachers have about gifted education to the type of inservice available for the development of understanding and teaching skills and methodology with gifted students.

Participants can be 'mentally absent' in staff development programs because they are not interested, motivated by the trainer or feel that they do not need to attend the staff development. This is a frequent response to the unsuccessful efforts by the trainer responsible for the professional development because they fail to build the learning on the concerns, expectations and the experiences of the learners participating in the staff development (Brookfield, 1988). The trainer must address the initial question of the participants who want to know "What is in it for me?" and "Why am I here?". One way of approaching the teachers' reluctance to the professional development session is to appropriately acknowledge the background skills and knowledge of the participants (teachers) as experienced professionals who have much to offer. The fact that the teachers attending the staff development program have little or no formal training in how to teach gifted and talented children should not act as an obstacle to the successful delivery of staff development. The participant involved in the staff development is a teacher who has teaching skills and an understanding of how children learn. It is, therefore, the role of the facilitator to acknowledge these skills and offer ways to modify the teaching skills and enhance the knowledge to the benefit of the adult learner so a notable difference to the gifted and talented child in their classroom is achieved.

Gallagher (2000) suggests that teachers consider using professional teacher networks or even informal networks to set standards for teaching gifted students. This is a way forward in the organisation of teacher professional development and

complements the standards for post-graduate education that have been proposed by the National Association for Gifted Children (Parker, 1996). It was agreed that standards for post-graduate education were necessary once it was established that no standardisation in pre-requisites (or program requirements in specialised training programs in gifted education offered at tertiary level) existed in United States tertiary institutions (Parker & Karnes, 1987). Australia is in a similar position to the United States in this instance.

As mentioned previously, the report by the 2001 Senate Employment, Workplace Relations, Small Business and Education Committee on the education of gifted children contains 20 recommendations. Apparent in these recommendations is that more effective training and inservicing in gifted education should be implemented. In fact, contained in recommendation 16 is that...*"The authorities should ensure that the necessary professional development is available."* (2001, The Report of the Senate Employment, Workplace Relations, Small Business and Education Committee, p. 98). The adopting of this recommendation should result in the continued development of professional development and inservicing programs for practicing teachers in Australia.

SUMMARY

Specialised teacher training programs in gifted education clearly have specific goals that are well founded in the research literature (e.g. Feldhusen, 1985; Gallagher, 1985; Maker, 1975; Seeley, 1979; Sisk, 1975). The ability of these programs to appropriately prepare the specialist teacher to meet the needs of the gifted and talented student in a variety of gifted programs and the regular classroom is evident and consistent across the literature reviewed (e.g. Feldhusen

& Huffman 1987; Gross, 1997; Hansen & Feldhusen, 1994; Hanninen, 1988). A common theme seen in this review of the training models and professional development practices is that many of the practices useful for gifted students can be harnessed and used in the implementation of training programs for teachers (e.g. Johnson & Gentry, 2000; Robinson, 1985).

It has been consistently demonstrated in this section that those teachers who undertake specialised professional development or inservice or training in gifted education have a more positive attitude toward the gifted students and are better equipped to facilitate their learning (e.g. Hansen & Feldhusen, 1994; Hanninen, 1988; Sullenger et al., 1997). Although the experimental studies measuring the effectiveness of training in gifted education are valid, the sample sizes were small – for example, Hanninen’s (1988) comparison study only had 15 participants (with 5 in each of the trained, untrained and trainee group). Also, Hanninen’s (1988) study was the only one that compared the trainee teachers to teachers without training – therefore, the present study can provide valuable research into this aspect of the effect of specialised training in gifted education.

Utilising the stated competencies for teaching gifted students as a checklist for teachers entering training is posited by some of the researchers (Feldhusen & Hansen, 1987; Johnson & Gentry, 2000; Maker, 1975). This, combined with the concept of teachers designing and identifying their professional development needs allows for the training to be meaningful and facilitate change in the teachers’ approach to the gifted learner’s needs (Breiter, 1989; Brookfield, 1988; Conners, 1991; Tomlinson, 1986; Whitmore, 1983).

Rizza and Gentry's (2001) survey of six contemporary leaders in the field of gifted education (Gallagher, Kaplan, Reis, Renzulli, VanTassel-Baska and Tomlinson) asked what issues faced teachers in the 21st century. Three responded that appropriate preparation of teachers was an issue. For advancements in gifted education to take place, they felt that teachers needed to be trained to appropriately provide for the needs of the gifted and talented child in the regular classroom - as this is the placement now used most frequently in the United States. No longer can the classroom teacher rely on someone else to provide for the gifted students in the school: they must, in fact, take on this responsibility themselves. Gallagher commented that not enough has been done in the area of teacher preparation and that good personnel need to be accessible (Rizza & Gentry, 2001).

3.6 THE NOVICE VERSUS EXPERT TEACHER AND TEACHER EFFECTIVENESS

"Research informs educational pedagogy and research in gifted education has an important role in continuing to develop and define pedagogical strategies that are effective for use with gifted youth" (Rizza & Gentry, 2001, p. 170).

Teachers seek specialised training in gifted education for a variety of reasons. The common thread is that they have sought training because a need has been identified – not always, but often by the *trainee* himself or herself. The *trainee* teachers in the present study were engaged in teacher training programs in gifted education and, according to the literature, are defined as 'novice' teachers of gifted education. Although it is noted by Reynolds (1992) that we know very little about

the differences between novice and expert teachers, the gifted education literature provides support for the training of teachers and the effective practices of teachers after training (Cashion & Sullenger, 2000). The research that describes the teaching skills of novice and expert teachers provides a context for the teacher-in-training.

For the teacher to perceive a need for training they must believe that not all students are the same and that their existing teaching skills and practices are not sufficient to cater for these differences. The realisation of these differences, and a need to facilitate the students' learning in a different way, is the first step toward understanding the gifted student. The *trainee* attempts to address those specific needs but a lack of training and experience frustrates their attempts to do so and, consequently, they decide to engage in training.

Cashion and Sullenger (2000) reported that two years after *trainee* teachers in gifted education (no sample size identified in the study) completed their training they were using strategies and practices identified as appropriate teaching skills for gifted learners in their classroom. Practices included: focussing on the whole class; using specific individual needs; curriculum modifications; independent study and more open and flexible to a variety of learning strategies. In the post-training interviews, one teacher reported that her conscience would no longer allow her to ignore following through on changes (identified in the training) to assist the learning for the gifted and talented student (Cashion & Sullenger, 2000). Another teacher reported that the revision and broadening of their teaching practices was not the only benefit from the training - the empowering factor of knowing, understanding and being able to do something about the needs of gifted students made the

teacher more confident, effective and happy (Cashion & Sullenger, 2000). Gross (1994c) also reported enhanced empowerment and feelings of confidence amongst the participants in her study (n=67) after they completed their specialised training in gifted education. These are strong studies that demonstrate the effectiveness of the specialised teacher training in gifted education.

Expert teachers of gifted and talented students plan for small groups of students inside the whole group because the gifted student differs significantly to the average student and, therefore, teachers need to constantly modify content and teaching practice which, effectively, makes the teacher a specialist (VanTassel-Baska, 1988). Expert teachers of the gifted set expectations for the gifted student to meet in the form of learning outcomes and the beginning teacher needs to realise the need for students to be responsible for their own learning. The novice teacher should learn to set their own expectations to match those set by the students. The teaching methods and skills employed in the classroom should have learning as the primary focus of the school experience as the independent expectations of students' achievement are meaningless unless they are shared openly (Scheidecker & Freeman, 1999). If the student finds these expectations are too difficult then a re-negotiation can take place and the expectation modified. The teacher can also use pre-tests to avoid teaching material already mastered. These are teaching skills used by the expert teacher to facilitate the learning of the gifted and talented student. The teacher becomes an expert through a combination of background experiences, specialised teacher training, regular on-going reflection and observation and analysis of their own teaching skills.

What makes an effective teacher of the gifted has long been a question of research

studies (Baldwin, 1993; Batten, Marland & Khamis, 1993; Gallagher, 1985; Hansen, 1988; Hansen & Feldhusen, 1994; Maker, 1975; Persson, 1999; Seeley, 1989; Whitlock & DuCette, 1989). To begin, researchers looked for teacher characteristics, then at teacher competencies and finally to teaching skills (developed particularly through teacher training programs) to provide an answer to this question. Most of the research on teacher effectiveness has centered on teacher directed learning (Brophy & Good, 1986, Needels & Gage, 1991). This review of the literature has, so far, provided evidence that the student has to be involved in the learning for real learning to take place and therefore, it can be supposed that teacher directed learning is not always appropriate for gifted students. It is apparent, however, that considerable research on teacher effectiveness has taken place with a resurgence of interest in the topic as educational administrators expect 'accountability' from the teacher when discussing both the educational performance of the student and the teacher (based primarily on the students' achievement).

The capacity of the teacher to embrace change and to learn from it will assist in facilitating student learning. In a synthesis of the research on teacher effectiveness, O'Neill (1988) reported on the 20 most promising instructional research factors of teaching effectiveness. He divides the factors into three stages. Stage 1 (the *preactive* stage) listed learning environment, teacher knowledge, teacher organisation and curricular materials as factors relevant to teacher effectiveness (O'Neill, 1988). Stage 2 (the *interactive* stage) included the factors of teacher expectation; teacher enthusiasm; classroom climate; classroom management; teacher clarity; advance organisers; instructional mode; questioning level; direct instruction; time on task; variability; monitoring and teacher flexibility.

The third stage (the *postactive* stage) included three factors: feedback; teacher praise and teacher criticism (O'Neill, 1988). Novice teachers of gifted students, who undertake specialised teacher training in gifted education, have identified their own need for professional development and may be more willing to embrace the change required to move through the stages identified by O'Neill (1988). The teacher training is usually designed to challenge the *trainees'* beliefs about educational practices and attempts to moderate their concerns regarding the education of the gifted and talented student.

A research study carried out by Batten, Marland and Khamis (1993) surveyed Australian secondary school students (n=925) in three Australian states (Queensland, Victoria and New South Wales) and asked them specifically to define what an effective teacher was. The first phase of the study asked students' opinion of the teacher's good qualities and the second phase was an observation study of the teachers who were deemed effective by the students. The teachers chosen to be observed and interviewed were those who received the most nominations by students. There were 202 teachers nominated from the group of 925 and nine teachers received over 40 nominations each! Twenty-one teachers across the three States were observed and interviewed in the areas of teaching and learning; attitude to student; classroom management. The observation looked specifically at the competency demonstrated by the teacher in a range of teaching skills. The unanswered question from this study was where the teacher gained their competency of the teaching skills. Could the competency be measured at the completion of their general teacher training or was it developed 'on the job'? Whether the teachers in the study had undergone specialised training in gifted education was not investigated. The students' perception of successful teaching

strategies can be compared to the research studies investigating effective teaching. Most students measure the effectiveness of the teaching by determining how easily they have learnt from the teacher.

SUMMARY

Few research studies report on aspects of the *trainee* teachers specialising in gifted education – in fact, Gross (1994c), Sullenger et al., (1997) and Hanninen (1988) are amongst the few who have included the teacher-in-training in their research. It is for this reason that the present study was indeed needed to contribute to the research base on the *trainee* teacher. The expert teacher, on the other hand, has been included in much of the research on teacher characteristics, effective teaching skills, strategies, techniques and competencies (e.g. Bishop, 1968; Feldhusen, 1985; Gallagher, 1985; Maker, 1975; Witty, 1950). One of the significant factors tested in the present study (mentioned earlier) is whether these effective teachers are a product of specialised training in gifted education or not.

Teacher effectiveness, as measured by student perception, is usually based on whether the student feels an affinity with the teacher. It is also based on how 'easy' the student perceives the learning to be and whether or not the student 'achieves' good grades with the teacher. The study by Batten et al. (1993) identified that the students' perception of an effective teacher included teacher characteristics, teaching skills and teaching competencies. This common theme identified in this section investigating the teacher-in-training and teacher effectiveness is that students perceive teacher qualities (characteristics, teaching skills and competencies) in *combination* to determine a teacher's effectiveness. An identification of all the variables that interact between the teaching and learning

process can contribute to the determination of an effective teacher.

3.7 CERTIFICATION AND ENDORSEMENT OF GIFTED EDUCATION TEACHERS

"Advocates within the field must be proactive in preparing future teachers of the gifted through a solid knowledge foundation assured by rigorous certification and endorsement requirements and the highest competencies based on the unique needs of gifted students" (Karnes, Stephens & Whorton, 2000, p. 203).

This section reviewed the research literature related to certification and the endorsement standards that exist for teachers responsible for teaching gifted and talented children. Currently, neither Australia nor Europe has endorsement policies in the teaching of gifted students - far behind North America. In fact, 28 out of 50 states in the United States have certification requirements (Karnes, Stephens & Whorton, 2000). It is from this review that the discussion of possible certification guidelines based on the results of the present study will be discussed in Chapter Six.

In a Delphi Study (Cramer, 1991), a panel of 29 experts in gifted education stated that it was imperative to establish standards for the certification of teachers so that endorsement can be mandated. They agreed that teachers of the gifted student should be employed based on their training and credentials in gifted education and many gifted education specialists believed that certification is a policy that will assist teachers to gain credibility as a specialist and that certification should be compulsory (Parker & Karnes, 1987; Karnes et al., 2000; Renzulli, 1985). There were some legal cases in the United States courts related to personnel decisions

by school districts not to continue the employment of specialist gifted teachers as a result of declining enrolments (Karnes & Marquardt, 1995). Mandatory certification and endorsement of the specialist teacher of the gifted student would provide greater legal protection as favourable court rulings have resulted from these teachers having certification in gifted education.

A recommended model for certification was developed to provide quality control and consistency amongst the states in the United States (Parker & Karnes, 1987). The model was endorsed by the Teacher Certification sub-committee of the National Association for Gifted Children in the United States and was based on the specialist teacher of the gifted undertaking post-graduate degree studies in gifted education. The model has four sections: the first section recommended a minimum of 12 semester hours in one of the listed course content areas in gifted education; the second section suggested at least one course in research procedures; the third contracted a practicum supervised by University personnel and fourthly, a minimum of nine hours in a content course appropriate to the professional role of the student (Parker & Karnes, 1987). This example of a practical model of Teacher Certification substantiated the need for specialised teacher training in gifted education so that certification can be realised. Teacher certification and endorsement are vital to the future provision of effective teaching practices for gifted and talented students.

Baldwin (1993) listed the most frequently asked questions about the uniqueness of the teacher of gifted students. Among the six questions asked were: "What

specialised training should the teacher of the gifted have?" and "What type of educational background should the teacher of the gifted have?" (Baldwin, 1993, p. 621). Baldwin's (1993) review of the empirical research on successful teachers of the gifted showed that demonstrated competencies were achieved through specialised teacher training. She noted that with a new direction imposed by the US Education Department for heterogeneous grouping in the United States, pre-service teachers must, therefore, have a component of gifted education in their general teacher training programs.

Toll (2000) reported that the 28 states in the United States, with teacher certification and/or endorsement, take very positive approaches to teacher education for the gifted learner and those teachers who have endorsements are well trained to work with the gifted in the regular classroom. She does reiterate however, that without specialised training in gifted education, the myths and misconceptions regarding the elitism and redundancy in provision for these learners will continue to exist (Toll, 2000).

SUMMARY

It is apparent that the research undertaken in the United States on certification and endorsement of teachers in gifted education has determined a need for its existence (Cramer, 1991; Karnes et al., 2000; Parker & Karnes, 1987; Toll, 2000). Teachers who are certified or endorsed have been through an accredited training program in gifted education and therefore can be assumed to have the teaching

skills and competencies identified as effective with gifted learners (Baldwin, 1993). The evidence provided here supports the need for teachers to engage in specialised training and for Australia to adopt a model of certification and endorsement.

The 2001 Senate Committee of Inquiry report, referred to earlier, has noted amongst the 20 recommendations that more effective training and inservicing of teachers in gifted education should occur. In fact, included in recommendation 16 is that ...*"State and Territory education authorities should require that teachers in selective schools and classes have suitable gifted education qualifications"* (The 2001 Report of the Senate Employment, Workplace Relations, Small Business and Education Committee, p. 98). The adopting of this recommendation should assist in the future development of certification procedures in Australia. The recommendations of the 2001 Senate Committee of Inquiry report supported the need for teacher certification in Australia.

3.8 INSTRUMENTS: OBSERVATIONAL STUDIES AND RATING SCALES TO ASSESS TEACHING SKILLS

"The teacher is an important variable in any learning environment"
(Clark, 1983, p. 90).

This section focused on research studies related to classroom processes and the use of observation and rating scales to assess teaching skills. It was Remmers (1963) who found that the graphic rating scale method was used to identify general principles of teaching before the 1960's. This graphic rating scale method

collected information about teaching by using a continuum with categories along the side to guide the rater (Remmers, 1963). The rater assigned a score to each category, which made scoring possible by summing the numbers assigned to each category. This systematic method of rating the use of a teaching skill was further developed to include a measure of the effectiveness of the teaching skill. Remmer's (1963) concept of rating a teacher observation was the foundation stone for the teacher observation rating instrument used in this present study.

Historically, educational research attempted to measure teaching - typically by an inspector (or administrator as 'Judge') rating teaching based on the teacher's characteristics. This was restrictive as the teacher characteristics measured (for example, appearance, enthusiasm and intelligence) were not easily translated into teaching skills and therefore, research on the teacher's performance in the classroom moved its focus in the 1950 and 1960's to teacher behaviour (Hansen, 1988).

Simon and Boyer (1970) identified that teacher observations during this time moved their focus onto the curriculum and away from the teacher or the teacher's skills. By 1970, over 100 teacher observation instruments were being used in the assessment of teachers. The teacher observation instruments sought to measure teacher behaviour against the cognitive objectives of the teaching and thus, the teacher observations became more meaningful as comparative data were collected. This, in turn, meant that a higher level of reliability was reported by the researcher, as there was more strict control over the observation (Hansen, 1988).

Rosenshine and Furst's (1973) research was important in the development of

instruments to measure teaching in a quantitative way. It was Rosenshine and Furst (1973) who realised the quality of information collected from the teacher observation and its potential use in the investigation of teaching as a profession. Their work was the foundation of other research studies (e.g. Everston & Green, 1986; Shavelson, Webb & Burnstein, 1986) on the art and science of teaching (pedagogy) and has been linked to development of improved teacher training curriculum.

Shavelson, Webb and Burnstein (1986) presented a concept of 'mapping' a domain of measurement of teaching skills including planning, processes, outcomes and environment. The measurement of these four areas of teaching provided a base for measuring the goals of teacher training practicum experiences and an exploration of the practicum guidelines designed by Feldhusen and Huffman (1988) confirmed that planning, processes and outcomes were measured to register a satisfactory result in the teaching practice component of teacher education programs. An important aspect of the observation rating instrument is, indeed, the feedback component that is available in a summary at the conclusion of the observation (Hobar & Sullivan, 1984).

Gage (1965) stated that it was necessary to include balancing a positive classroom environment, teacher competencies and student achievement in the teacher observation procedure. Brophy and Good (1986) reported that teacher behaviour measured against student achievement was the focus of many of the teacher observation rating instruments developed. The reason for this may have been the desire for an objective measurement following on from the initial work by Rosenshine and Furst (1973) to develop quantitative data to enhance teaching as

a profession. Everston and Green (1986) established a system for recording observational data, which included categorical systems, descriptive systems, narrative systems and technological records. It was suggested that the researcher must decide the research question that is being explored before selecting the most appropriate method of recording the observational data (Everston & Green, 1986)

Continual re-evaluation of the observation rating instruments produced tighter control of observation time and the rater and this, in turn, led to higher reliability reported among the researchers of teaching effectiveness (Brophy & Good, 1986). Gage (1965) noted that objectivity was the key to successful observation rating instruments and many of the procedures attached to the observation instrument did not include operationally defined behaviours; provided poor training for the rater for the establishment of inter-rater reliability and possessed a lack of awareness of generalisation (Borich & Klinzing, 1986). Amongst the suggestions for improving low inference measurement in classroom observation instruments was the training of raters in the correct use of the observation instrument, particularly as raters felt they had to observe a behaviour as it was listed on the instrument (Borich & Klinzing, 1986).

The humanness of the rater inherently provided concern for the reliability of the observation and the systematic training of raters was one way to alleviate the inter-rater reliability concerns (Remmers, 1963; Ryans, 1961). Raters were trained in a six step process involving the senior rater and the trainee raters in a series of briefings where they carefully studied the observation rating instrument. The training included simultaneous and independent mock observation and the results after the training showed that the raters had a good inter-rater reliability (Ryans,

1961). The training of raters in the present study followed a similar procedure, which is discussed in Chapter Four.

It was reported by Medley, Soar and Coker (1984) that the observation rating instrument had to contain distinctive steps that led to objective teacher performance observation. Firstly, the teaching task to be performed was agreed upon between the rater and the teacher being observed; then a quantifiable record of the observation was completed; a score was derived from the observation instrument and finally, the score compared to a standard that was pre-determined before the observation (Medley et al., 1984). The present study employed these principles of task, score, record and standard in the completing of the observation rating instrument.

Hobar and Sullivan (1984) reported that 50 years of teacher observation had assisted in the development of rating scales through analysis of observable variables (teaching skills and competencies) and teacher-student interactions. In fact, results of the continual classroom observation procedures to measure teaching skills since the 1940's have seen an evolution in the sophistication of the observational rating instruments in existence. More recently, researchers have used the teacher observation rating scales to investigate the relationship between teaching and learning. This is an acknowledgment that student achievement testing is *not* the only way to measure a teacher's effectiveness. It also acknowledges the role of the teacher as a facilitator of learning. As teaching

became less teacher centered in the 1990's, it allowed for students to be more autonomous (Baldwin et al., 2000; Ryser & Johnsen 1996).

SUMMARY

The development of a valid and purposeful teacher observation rating instrument was the common theme demonstrated throughout this section of the literature review. From the introduction of teacher observation rating instruments in the early 1950's and 60's, measuring teacher behaviours (Remmers, 1963), through to the objective style of rating using a standard measure and assessing teacher behaviour against the curriculum goals (Medley et al., 1984), there was a consistency demonstrated throughout the literature that puts forward reasons for using student achievement as a measure of teacher effectiveness (Brophy & Good, 1986) and valid arguments against using student achievement as the only measure of successful teacher behaviours (Ryser & Johnsen, 1996).

Research on effective teaching skills and how teaching practices effect learning for the gifted student in the classroom is abundant and the effective measurement of classroom happenings, in the short and long term, is easily identifiable (Ryser & Johnsen 1996). Clarification of the critical attributes of effective and desired classroom practices, and how these are implemented in the classroom, can be measured by valid and respectable instruments. The gathering of these data and the reporting of the results provides evidence of the effectiveness of specialised teacher training programs and teacher professional development in gifted

education (Ryser & Johnsen 1996).

3.9 INSTRUMENTS: OBSERVATION AND QUESTIONNAIRES MEASURING STUDENT PERCEPTION OF TEACHERS' CLASSROOM CLIMATE, FOCUS AND ENVIRONMENT

"Students are in a much better position to report on the emphasis actually given to various class activities. Moreover, the nature of the instructional climate depends in part on the way it is perceived by the students themselves" (Steele, 1981, p. 3).

Three dimensions are found in an instructional setting; the intellectual disposition of the student; the resources for study of the content; and the climate for learning - or classroom climate (Steele, 1981). Research on the development of instruments to assess classroom climate clearly stated that the two most popular methods of collecting data are observation and questionnaires (Steele, 1981). Both methods are discussed in this section of the literature review as the development of the observation instruments strongly influenced the defining of the student-response questionnaires and in clarifying the definition of the classroom climate (Flanders & Simon, 1969; Gallagher & Jenne, 1963; Steele, 1981; Steele, House & Kerins, 1971).

Firstly, the observation instruments used to measure student and teacher interaction were subjective and made a judgment about the interaction. Wrightstone, Justman and Robbins (1956) designed an instrument called the *Pupil-Teacher Rapport Scale* in which he measured the assessment of student-teacher interaction. This scale rated the teacher's behaviour as dominant or integrating in relation to how well the teacher involved the students in the learning process. The

Pupil-Teacher Rapport Scale (Wrightstone et al., 1956) was used as a foundation by Withall (1967), who developed a *Climate Index* to categorise teacher behaviour as integrative (student centered) or dominative (teacher centered).

Observation instruments were used to rate the teacher's behaviour toward the student and Withall's (1967) *Climate Index* became the basis for the development of many other instruments for measuring classroom climate. Medley and Mitzel (1963) designed an *Observation schedule and record* to categorise teacher behaviours, the teacher's verbal emphasis and the social structure of the classroom. Researchers (e.g. Flanders & Simon, 1969) during the mid to late 1960's used the Medley and Mitzel (1963) *Observation schedule and record* together with Withall's (1967) *Climate Index* to categorise teachers' statements made to students and non-verbal interactions in the classroom during the observation. Much of what happened during the observation was intended for the subjective judgment to be recorded and again, the subjectivity of the observation became an issue for further investigation.

Getzels and Thelen (1960) recorded the classroom as a social system that defined climate as a result of the way the teacher balanced role requirements and personality needs within the classroom. This prompted Flanders and Simon (1969) to report on the need for an instrument that focused on the sequence of behaviours observed in the classroom and on direct and indirect teacher influences such as teacher talk, acceptance of feelings, praise and encouragement by teacher and student discussion. Many of the items identified on these early observation instruments (e.g. *Observation schedule and record* and *Climate Index*) were later used to develop the questionnaires to measure students' perception of the

classroom climate.

Gallagher and Jenne's (1963) *Topic Classification System* included items not previously included on instruments used to measure classroom climate. The items included were a rating for the cognitive and affective dimensions that categorise levels of teacher instruction, the teacher's style in leading a discussion and the teacher's approach to conceptualisation (Hansen, 1988).

It was the development and the introduction of student questionnaires to measure classroom climate that gave this area of the research a different perspective. The self-reporting questionnaires required a high inference response by the student whose view of the climate in the classroom was based on teacher expectations (Hansen, 1988). Stern, Stein and Bloom (1956) developed the *School Characteristics Index*, which listed 300 items describing daily activities, attitudes and impressions in a typical United States high school. As mentioned earlier, Bishop's (1968) study of student perceptions of an effective teacher (n=181) used a student questionnaire to assess classroom behaviour of teachers (n=109) deemed successful by intellectually gifted, high achieving high school students. Typical student comments included that the teacher's classroom was stimulating, motivational and inspirational (Bishop, 1968). As previously mentioned, Bishop's (1968) comparison with a control group of teachers (n=97) who were randomly selected, strengthened the findings in his study.

The teacher's central role in the classroom is to define the instructional outcomes, to initiate the thought processes and to determine the emphasis of the classroom climate (Gallagher & Jenne, 1963). At this stage of the research on the classroom

climate (the early 1970's) it was proposed that the students in the classroom could be treated as the unit of analysis and the classroom climate could be the variable to be tested. Researchers needed to select instruments with low or high inference depending on what it is they want to infer from the data.

In response to the variable of classroom climate to be tested, Steele, House and Kerins (1971) designed the *Class Activities Questionnaire* that used low inference items to assess affective and cognitive dimensions including classroom focus (for example, discussion, stress on grades) and classroom climate (for example, student independence, humour, teacher talk). The initial design of the *Class Activities Questionnaire* instrument began with an investigation of dimensions of an instructional climate that would be common by a diverse range of instructional settings. It was decided that the dimensions in common were the cognitive and affective domains (Steele, 1981).

The further refinement of the *Class Activities Questionnaire* (Steele, 1981) produced a self-reporting questionnaire that was completed by both the teacher and the students. It was reported that the teacher had an error rate in assessing the instructional climate with this instrument, which is understandable because it could be difficult for some teachers to be objective about themselves.

The *Class Activities Questionnaire* (Steele, 1981) was useful in identifying teaching behaviours that are appropriate in teaching gifted and talented students (Steele, 1981). These indicators in the *Class Activities Questionnaire* (Steele, 1981) are : student involvement and enthusiasm (items 19 and 24); intellectual atmosphere (Item 24); higher thought processes (Items 3 and 13, 7 and 12, 11 and 23, 2 and

20); independence (Item 14) and divergence (Item 17). The State of Illinois Gifted Program accepted the standards outlined by Steele (1981) as appropriate for use with gifted education programs.

Self-reporting questionnaires are advantageous to the researcher because they are inexpensive, standardised and time efficient. Goodall and Brown (1983) developed an attitude questionnaire to assess the degree and magnitude of students' attitudes towards the learning process called the *Group Climate Survey*. This was in response to a need for educators to explore the effect that students' perception may have on student behaviour in class. More recently, Gentry and Gable (2001) designed and tested for content validity, a student-response questionnaire called *My Class Activities*. A large sample (n=1523) of students in Year 6-8 determined the following four dimensions of classroom climate: student's level of interest, challenge, choice and enjoyment in the class.

SUMMARY

The common theme apparent in the development of instruments used for measuring student perceptions of the classroom climate was the teacher's behavior in the classroom (e.g. Medley & Mitzel, 1963). Most of the literature reports on the student assessing the teacher based on characteristics, behaviours and the positive or pleasant climate or environment created in the classroom. Wrightstone et al., (1956) and Withall (1967) were on the right track when they identified the need for the instruments to measure the climate as teacher centered or student centered. A consistent theme appearing throughout the literature reported in this section was that the instruments needed to include aspects of the teacher's instructional skills so that students' could assess classroom climate with

a more focused approach (Gallagher & Jenne, 1963).

The development of the *Class Activities Questionnaire* (Steele, 1981) showed a tremendous move forward in the use of self-reporting instruments to measure students' perception of the classroom climate based on the teachers' ability to address individual learning needs of students. The gifted student requires specific cognitive and affective factors to be addressed by the teacher due to the gifted learner's developmental advancement and this instrument allows for the student to assess the classroom climate based on the teacher's ability to meet those individual needs.

Schön's (1987) examination of the Master class in musical performance demonstrated how the teacher created the environment in the classroom by reflecting on the knowledge and practice of student with the teacher as coach. O'Neill's (1988) synthesis of the research literature on teaching effectiveness found that classroom climate was essential for an effective learning environment. He found that the classroom climate was defined as supportive, warm, pleasant, fair, democratic, personal, congenial and understanding (O'Neill, 1988). He did not measure classroom climates, but merely defined it according to the research literature from 1974-1985.

3.10 SUMMARY

"...the teacher should be concerned with understanding the motives of his students...if he can identify some of the reasons which have brought each student into his class, this will provide a valuable first point of contact, and also give him access to a most powerful stimulus to learning" (Rogers, 1977, p. 11).

The move away from identifying and listing desirable teacher characteristics of the gifted student (e.g. Bishop, 1968; Hultgren & Seeley, 1982; Witty, 1950) toward identifying and listing effective teaching skills and competencies (e.g. Feldhusen, 1985; Maker, 1975; Wyatt, 1982) opened up a variety of research continuums. The identification of effective teaching skills and competencies resulted in the development of successful teacher training programs (e.g. Gross, 1994c; Robinson, 1985; Sullenger et al., 1997) that provided the already trained teacher of the regular classroom with an opportunity to become a specialist teacher of the gifted. Professional development options were wide and varied and the move from novice to expert teacher of the gifted reinforced the research findings of successful teacher characteristics, teaching skills, strategies, techniques and competencies (e.g. Hansen & Feldhusen, 1994). The gifted and talented student needs specialised instruction that addresses their developmental advancement and the specialist teacher of the gifted is the most appropriate person to meet the needs of the gifted child in the classroom (Rogers, 2002). Support, however, for the specialist teacher through certification and endorsement processes is not standard around the world (Karnes et al., 2000).

The literature review presented is extensive and the common theme throughout is that the effective teacher of the gifted and talented student is one who displays

certain characteristics and can utilise specific instructional skills identified as successful by gifted students. The effective teacher can be identified through a checklist of characteristics and through observation of teaching skills and strategies but it was **how** the teacher acquired the characteristics and teaching skills identified as effective that prompted the present study. Few researchers had measured whether the competencies (identified as goals) of the specialised teacher training programs were in fact integral to the success of these effective teachers of the gifted. Did teachers learn 'on the job' to be effective teachers of the gifted or was the specialised training in gifted education an important variable in their demonstration of effective teaching skills and achievement of a positive classroom climate for gifted learners? Was the **rigour** of the training program also integral to the outcome of teacher effectiveness and classroom climate?

Sullenger et al. (1997) described a summer institute where teachers undertook specialised training in gifted education in which the class contact time was eight hours a day over a three week period. The Sullenger et al. (1997) study had a small sample size – only 25 teachers participated in the study, whereas the present study had 167 teachers in the sample. The training program used in the present study had 75 contact hours and was carried out over a 15 month period requiring participants to complete five rigorous 2,000 word assignments investigating the identification of gifted students, appropriate programs and provisions, the development of a unit of work for a gifted learner and to investigate the social and emotional needs of the gifted.

Hansen's (1988) study measured trained and untrained teachers and the teachers in the trained group were engaged in their practicum for a post-graduate program

specialising in gifted education. The rigour of the training program was not described in the research findings and the aspect of the trainees engaged in the training was not included in the study.

Hanninen (1988) had a small sample size ($n=15$) and, although she did measure trained, untrained and trainee teachers, the sample was small. As it was not a quantitative study, no quantitative data was collected to support the qualitative findings.

Gross (1994c) measured attitudes toward the gifted learner pre and post training and the trainee teachers ($n=67$) developed a more positive attitude toward the gifted learner by the conclusion of their training. The training program used in the Gross (1994c) study was the same as the training program in the present study.

Maker's (1975) research was influential in determining the 'entering' and 'exiting' characteristics of effective teachers of the gifted and the connection between these natural or innate characteristics influenced the decision to include the trainees in the present study so as to investigate the potential to perform through the understanding of these natural personological characteristics as a factor in the development of an effective teacher of the gifted, Maker's (1988) reference to the 'entering' characteristics being potentially undesirable and the effect specialised training could have on these to become more desirable 'exiting' competencies aligned with Gagne's (1995) concept of a developmental process of learning, training and practising with the interaction of various catalysts upon this central continuum. Maker (1988) proposed at least five 'exiting' competencies that, in fact, were closely aligned to the teaching skills measured on the instrument used in the

present study and so the Maker research (1975) was influential on the present study's investigation of successful teaching skills used by trained, untrained and trainee teachers of the gifted.

Silverman (1980) identified the natural characteristics of Master teachers who had not undergone specialised training in gifted education but were in fact gifted and talented themselves. She found that the characteristics identified were integral to their success as 'coaches' to their students.

The Hultgren and Seeley (1982) study had a large sample size (n=668) and measured the perception of university personnel and practitioners involved with gifted and talented students to propose a list of 21 competencies required by effective teachers of the gifted. The competencies identified agreed with those identified much earlier by Witty (1950), Bishop (1968) and Maker (1975).

Starko and Schack (1989) measured teaching skills of the effective teacher of the gifted (n=318) but did not identify the teachers as trained, untrained or undertaking training in gifted education. Although the sample size was large, there was no indication of the level of specialised training and therefore, the identification of the training factor was not present in their study.

The present study was required to be undertaken as there was no previous research carried out in Australia measuring the success of teacher training programs in gifted education and much of the research carried out in Northern America had some smaller sample sizes whilst the rigour of the training program was not prominent in the description of the research findings. Also teachers with

the 'potential to perform' (i.e. trainees) were not included in the sample of many studies – and if they were, the sample size was generally small (e.g. Hanninen's (1988) study had only five trainees in the sample).

Early classroom observations of teaching practice were perception based and did involve rating scales. Research that followed allowed the development of instruments based on learner centered dimensions rather than only teacher behaviour. Reliability increased as the sophistication of the scales and their validity was established. This led to increased reliability on the part of the observer as they changed their role from judge to rater. In turn, the rater and inter-rater reliability increased because the observation of teachers and the instruments became more accurate and objective.

Observational studies of teachers in schools attempted to record everything that happened in the classroom and to link teacher behaviours to outcomes in an attempt to create the perfect teacher. The researchers continued to refine the instruments used to analyse teaching behaviours and to create groups of variables or categories in which to place that teacher behaviour. It was then an objective of the researcher to use the instrument to correlate a particular category or 'observable behaviour' to student achievement in an attempt to measure the classroom climate.

The *Class Activities Questionnaire* (Steele, 1981) was adapted and used in the present study to identify factors of the climate in the classroom. The teacher, however, was not asked to complete the questionnaire due to the poor error rate reported in a study validating the instrument (Steele, 1981). It is conceded that the

responses of the teacher would have assisted in a re-assessment of the planning and management of the classroom - however, this was not a purpose of the study. The purpose was to measure the students' perceptions of the classroom climate; therefore, it was the gifted students in the classes of the observed teachers who completed the questionnaire.

Today, teacher training programs focus their curriculum on teacher skills and competencies. The research supports that teachers with specialised training in gifted education are better at identifying, supporting and programming for gifted students whilst also meeting their affective needs. Provision for the gifted student must include an optimal match of the best available teacher and resources. This study sought to investigate to what extent the teacher training programs correlate with observable teacher skills and competencies and what, if any, the effect of these skills and competencies have on the classroom climate. The following Chapter outlines the methods and procedures undertaken to investigate the effectiveness of the specialised teacher training programs.

In 1993, the United States Department of Education produced a federal report *National excellence: a Case for developing America's talent* which suggests that the components of the gifted education movement could have a positive effect on general education (United States Department of Education, 1993). This policy came 20 years after the Marland (1971) Report to Congress that was a strong policy on gifted education and had a long life advocating specialised programs and provisions for the gifted. The 1993 United States Department of Education document has emphasised a different direction for gifted education.

The 2001 Senate Employment, Workplace Relations, Small Business and Education Committee foreword stated that the inquiry "was prompted by continuing concern about whether the education system adequately responds to the special needs of gifted children" (p. xi). The 2001 Committee report contains 20 recommendations on the education of the gifted in Australia. Again, more effective training and inservicing in gifted education was recommended. In fact, recommendation 14 states that ...*"State and Territory education authorities should require, as a condition of employment, that newly post-graduated teachers have at least a semester unit on the special needs of gifted children in their degrees"* (The Report of the Senate Employment, Workplace Relations, Small Business and Education Committee, 2001, p. 96). If adopted, it is not known how this recommendation, along with the others contained in the report, will impact on the education of gifted students in Australia.

PART THREE: METHODOLOGICAL CONSIDERATIONS

CHAPTER 4

METHODOLOGY

4.1 INTRODUCTION

"Conducting research with any special population places special challenges on researchers, and the very nature of gifted education adds additional challenges" (Ryser & Johnsen, 1996, p. 482).

The research hypotheses in the present study were tested by means of a descriptive, quasi-experimental research design. Descriptive statistics describe numerical data and is categorised as univariate, bivariate or multivariate depending on the number of variables involved (Neuman, 1997). Descriptive research identifies and interprets existing trends and relationships between the chosen variables in the study (de Vaus, 1995). An experimental research design divides the sample into two or more identical groups and is called experimental as it describes the reactions of one group (who is given a condition) compared to the reactions of the other group (who is not given the condition) - in this case, the condition was specialised training in gifted education. While controlling the setting for both groups and giving only one treatment (for example, training in gifted

education), the researcher can conclude that any differences found between the groups is due to the treatment (Neuman, 1997).

Descriptive statistics report on relationships that have taken place and allows for the 'not observed' factor in its analysis. While this experimental research design is not concerned with the individuals as *individuals*, it does provide a snapshot of the total sample group and attempts to generalise relationships to a wider sample population (Neuman, 1997). It is a particularly appropriate method in educational research because it does not involve the introduction of potentially threatening or ethically sensitive variables (Cohen & Manion, 1989). The present study used a quantitative approach to the data analysis for the instruments –see section 4.2 for a description of the instruments. The *Class Activities Questionnaire (CAQ)* allowed for three open response items and qualitative analysis of this data was used. More specifically, the qualitative data was categorised according to the variables on the *Class Activities Questionnaire (CAQ)* and a frequency table was established to determine generalisations in the students' responses.

The present study compared the teaching skills of teachers who received training in gifted education to those who did not; and compared the instructional climate in classrooms of teachers who received training in gifted education with those who did not. It was not possible to collect information prior to participants initiating their specialised training in gifted education, therefore, the study essentially used a 'posttest only' design as it did not allow for a comparison of the groups before the

treatment. Three groups participated in this study (n=167); *trained*, *trainee* and *untrained* teachers of gifted students. All teachers were teaching at least five nominated gifted and talented students in a variety of programs. *Trained* teachers (n=56) were defined as those who had completed the post-graduate Certificate of Gifted Education at the University of New South Wales (or an equivalent course at another university) or at least two Master of Education subjects in gifted education. *Trainee* teachers (n=31) were defined as those who were currently enrolled in the post-graduate Certificate of Gifted Education at the University of New South Wales (or equivalent) or a Master of Education subject in gifted education. *Untrained* teachers (n=80) were those who had undertaken neither the Certificate of Gifted Education at the University of New South Wales (or equivalent) nor two Master of Education gifted education subjects at post-graduate level. All teachers in the study had, of course, undertaken an under-graduate degree or diploma in education and were qualified teachers. Thus, the labelling of teachers as *trained*, *trainee* and *untrained* refers only to the teachers' specialised teacher training in gifted education.

The methodology used was that of both observation and survey. Teacher effectiveness was assessed using an 'observable criteria' checklist (the *Teacher Observation Form*) which was completed by trained raters - see *Appendix B*. The instructional climate in teachers' classrooms was assessed by a survey instrument (the *Class Activities Questionnaire*) completed by five identified gifted students from each class taught by selected teachers - see *Appendix C*. The teachers'

background variables were collected using a questionnaire (the *Participant Information Form*) - see *Appendix A*. The data collected for this study were both qualitative and quantitative in nature with the main method of analysis for the quantitative data being statistical analysis. The statistical methods used were selected to provide information about the identified variables in the research questions of this study.

In the present study, a planned contrast approach was adopted. Therefore, Bonferroni *t*-tests rather than a post hoc analysis were carried out. The use of "a priori" comparison testing (a pre-planned comparison using individual *t*-tests between pairs of groups) was used when performing the data analysis. The analysis used a "Bonferroni *t*" (Dunn's test), as a more conservative level of significance for each comparison, and will be noted when reporting of the results of the *t*-tests in Chapter 5. The clarification of these two issues alleviates the need for any post-hoc analyses. In fact, Bonferroni *t*-test is appropriate according to the study's research design because a more conservative significance level (specifically, $.005/2 = .025$ rather than $.05$) was used.

The raters, teachers and students who participated in this study were all volunteers. The teachers and students who participated came from a cross section of primary and secondary education; government, independent and catholic education systems and from urban, suburban and regional school districts. The raters were from primary, secondary and tertiary education sectors and all were city dwellers.

4.2 INSTRUMENTS

"...researchers must attend to the technical adequacy of the measures they are using to collect the data" (Ryser & Johnsen, 1996, p. 494).

(i) The Participant Information Form (PIF)

Psychological, demographic and experiential information on participating teachers was collected through the *Participant Information Form (PIF)* – see *Appendix A*. This was based on an instrument developed for Hansen's (1988) study to collect background information on the teacher and their teaching experience in relation to 11 variables. The background information was categorised as psychological, demographic and experiential. The *Participant Information Form (PIF)* sought data on 11 variables: gender; training in gifted education; year level taught during the period of observation; type of program currently teaching; years of regular teaching experience; years of teaching experience with gifted and talented students; interest in pursuing training in gifted education; average grade in undergraduate study; support for educational programming for gifted and talented students; currently teaching in their specific subject area and satisfaction with current position as a teacher.

The *Participant Information Form (PIF)* was revised after use with participants (n=43) in the pilot study. At first, it was designed in a two form format with Form A designed to survey the *trained* and *trainee* groups and Form B designed to survey the *untrained* group. However, Forms A and B were collapsed at the completion of the pilot study and consequently made into one form as separate forms did not allow collection of data on the participants' prior training in gifted education.

The *Participant Information Form (PIF)* was originally designed by the staff and faculty of the Gifted Education Research Institute (GERI) at Purdue University, Lafayette, Indiana. It was modified in its design by the researcher of this study in a Master of Education class ('Survey Design and Analysis', 1994 at the University of New South Wales) and was critiqued and reviewed by the lecturer and peers of that class.

(ii) Teacher Observation Form (TOF)

The *Teacher Observation Form (TOF)* [see Appendix B] was designed at the Gifted Education Resource Institute (GERI) at Purdue University, Indiana and used initially for the assessment of teachers during the teaching of the Super Saturday Program for gifted and talented children (Feldhusen and Hansen, 1987). Feldhusen and Huffman (1988) reported that the items were developed, and the *Teacher Observation Form (TOF)* was field tested on 251 teachers of gifted students. The form was reviewed by 10 Professors in the field of teacher training in gifted education in the United States and all items were evaluated for appropriateness and for clarity of expression. An earlier version of the *Teacher Observation Form (TOF)* was also used for evaluating trainee teachers on their practicum experience in a post-graduate training program in gifted education by Feldhusen and Huffman (1988). The instrument was revised slightly by Hansen (1988) for her study and she reported that the ratings were high and generally supportive of its usefulness in assessing teaching skills for teachers of gifted and talented students. It was further revised for the purposes of the present study to conform to Australian language and cultural norms.

The *Teacher Observation Form (TOF)* consists of 12 items that are a combination of rating scale items and checklist items. The purpose of The *Teacher Observation Form (TOF)* is to measure observable teaching skills as listed by each of the 12 items. Rating scale items and checklist items have been widely used and found appropriate in the evaluation of teaching skills (Hansen, 1988; Medley, Soar & Coker, 1984; Remmers, 1963; Rosenshine & Furst, 1973; Ryser and Johnsen, 1996). The 12 items on the *Teacher Observation Form (TOF)* focus on critical teaching skills appropriate in teaching gifted and talented students. The items are as follows:

- 1) subject matter coverage (concept orientation, teacher expertise)
- 2) clarity of teaching (communication skills, sufficient examples)
- 3) motivational techniques (teacher energy and enthusiasm, variety)
- 4) pace of instruction (individual needs accommodated and appropriate)
- 5) opportunity for self-determination of activities by student (in class/at home)
- 6) a variety of experiences offered (discussions, small group/whole group activities)
- 7) teacher-student interaction (activities that promote group learning/problem solving, independent study processes, respect for individuals' ideas)
- 8) opportunity for student follow through for homework (thorough instruction and assistance by teacher)
- 9) emphasis on higher level thinking (Bloom's taxonomy and critical thinking)
- 10) emphasis on creativity (creative thinking skills and open-ended questioning, encourage risk taking)
- 11) teacher planning (flexible and student-centered)
- 12) learning aids (appropriate, clear, grammatically correct, range of materials)

Although a variety of instructional strategies can be used with the gifted learner, some are more appropriate than others are and research on excellent teaching practice supports the above 12 items as tapping appropriate teaching skills for gifted and talented students.

- 1) VanTassel-Baska's (1988) research shows that curriculum for gifted students should be broad and concept orientated. The teacher should look at the big picture in her subject orientation with a view to engaging the students in the subject matter. This means that sufficient examples must be clearly given to demonstrate a concept by the teacher.
- 2) Bishop (1985) noted that the teacher of the gifted must have effective communication skills because the teacher-pupil interaction is viewed as a process of negotiating meaning rather than imposing fixed procedures.
- 3) Motivation is a critically important variable in the learning equation and gifted students differ greatly in their ability, knowledge base and style of learning. Nicholls' (1983) research shows that the gifted student tended to be task involved – meaning they tend to be motivated by a desire to learn and improve in achievement rather than to be “better” than other students.
- 4) Each student must be encouraged to build his or her own conceptual construct that permits the ordering of knowledge and the teacher's pace of instruction allows for the learner to work at a depth and speed appropriate to their needs (Bishop, 1985).
- 5) Bloom (1985) suggests that teachers are gatekeepers for the academically gifted learner and, therefore, as practitioners the teacher should provide opportunities for the student's self determination of activities in class and at home.

- 6) A broadening of the student's view of the world through a variety of experiences is offered by Gallagher's (1985) explanation of excellent teachers of the gifted.
- 7) Activities that promote group learning and problem-centered learning place the student at the centre of the decision making process and Bishop (1985) defines this as "goal-directed interaction (teacher and students), in which the participants seek to attain their respective goals" (p.27.) It is acknowledged that the initial goals of the teacher may be quite different to those of the student but through negotiation, mutually respected learning goals are established and attained.
- 8) Gifted students are capable of formulating their own goals in a learning situation and, through assistance from the teacher, the opportunity for student follow-through will strengthen the student's motivation to learn.
- 9) In planning for gifted students, the teacher herself must be open to alternative ways of thinking. Gifted students should be taught how to think and to think more effectively. By recognizing that students may develop their own ways of thinking about ideas, the teacher can help each student fulfil his or her potential. Evidence indicates that the gifted student is superior in thinking ability (Sternberg, 1985) and therefore, the teacher must provide an emphasis on the development of higher-level thinking, critical thinking and creative thinking skills.
- 10) The development of this strength in higher-level, creative and critical thinking skills assists the gifted student to problem solve and to think at a higher and more complex level (Feldhusen, 1989).
- 11) The approach to instruction for the gifted learner requires considerable planning and restructuring of course materials as well as traditional teaching concepts. As teachers often believe their job is to transmit knowledge which students

receive and store them until they are needed at a later date. Methods of direct instruction are based on the belief that students are containers to be filled and those students receive these messages because their idea of learning does not match the teacher's idea of teaching. Teaching the gifted student requires a reassessment of instructional methods so that the classroom becomes a flexible and student –centered learning environment.

- 12) The core of the instructional approach is a set of problematic tasks that focus attention on the key concepts of the discipline that will guide students to construct effective ways of thinking about that subject (Feldhusen, 1989).

The 12 items, assessing appropriate instructional skills for gifted learners are therefore supported in the literature. The instrument was first used by Feldhusen and Huffman (1988) in their evaluation of trainee teachers on a teaching practicum experience in a post-graduate training program in gifted education. At that time, the instrument consisted of only 10 items - two items, "Emphasis on creativity" and "teacher planning" were not included.

Under each of the 12 items on the *TOF* is a checklist of criteria. When the rater observes a teaching skill a check is then placed beside that behaviour and the item is ranked on a Likert scale from five to one using the following: 5 outstanding; 4 high; 3 average; 2 needs some improvement; 1 not satisfactory. If no teaching skill is observed under any one of the items, the n/o or not observed is checked on the rating scale.

Internal consistency reliability estimates were conducted for the *Teacher Observation Form (TOF)* by the designers and an Alpha coefficient ($\text{Alpha} = .86$)

was reported which demonstrates good reliability for the study (Hansen, 1988) - see *Appendix D* for the table of item-total reliability coefficients for the *Teacher Observation Form (TOF)*.

(iii) The Class Activities Questionnaire (CAQ)

The *Class Activities Questionnaire (CAQ)* – [see *Appendix C*] (Steele, 1981) was initially designed to measure whether the outcomes of a course were being met and to enable teachers to "better match behaviours to these purposes" (Steele, 1981, p.4). The questionnaire, originally designed by Steele, House and Kerins (1971), provides a description of the instructional climate observed. It was slightly modified for the purposes of this study (for example, the language modified to suit Australian English).

There are 27 items on the *Class Activities Questionnaire (CAQ)* and the student is asked if they strongly agree, agree, disagree or strongly disagree with each statement. The 27 items are categorised into 16 factors and the 16 factors are further categorised into four dimensions. The four dimensions of instructional climate measured by the *Class Activities Questionnaire (CAQ)* are: lower thought processes, higher thought processes, classroom focus (how teachers and students interact) and classroom climate (student attitudes and feelings).

Scoring of the *Class Activities Questionnaire (CAQ)* is similar to a consensus scoring system used by other instruments that are designed to assess learning environments through students' perceptions of these environments (Hansen, 1988). Items are paired that reflect the same category; for example, higher-thought processes (items 3 and 13). In order for a factor to be scored, at least

66% of the class must show a consistent response to the pair of items. Mean scores towards 1.0 indicate a positive attitude to the statement and scores near 4.0 indicate a negative attitude. Scores between 2.25 and 2.75 indicate a neutral attitude toward statements (Steele, 1981).

Steele (1981) reported agreement on the classification of the *Class Activities Questionnaire (CAQ)* items by a sample of Professors who reviewed the instrument, giving evidence of content validity for the instrument. Steele (1981) also reported construct validity of the instrument derived from factor analysis - see *Appendix C* for a detailed table of results of Steele's (1981) factor analysis. The factor analysis carried out on the four dimensions of the *Class Activities Questionnaire (CAQ)* identified *classroom focus* and *higher-level thought processes* to be significant at $p < .05$. (Steele, 1981).

It is reported by Hansen (1988) that the *Class Activities Questionnaire (CAQ)* produced a low variance in a distribution of scores within a classroom of students - see *Appendix C*. The following Table 4.1 shows the reliability estimates for 16 individual factors and the four dimensions of the *Class Activities Questionnaire (CAQ)* in a pilot study (n=131) conducted by Steele (1981) to assess classroom climate.

Table 4.1: Reliability of coefficients for the CAQ - (Steele 1981 Scoring Manual for the CAQ) and Based on the Horst Formula applied to 131 classes

Dimensions	Factors	Correlation Coefficient (r)
Lower thought processes r =.76	1. Memory	.88
	2. Translation	.65
	3. Interpretation	.86
Higher thought processes r =.88	4. Application	.83
	5. Analysis	.78
	6. Synthesis	.89
	7. Evaluation	.71
Classroom focus r =.88	8. Discussion	.58
	9. Test/grade stress	.89
	10. Lecture	.82
Classroom climate r =.86	11. Enthusiasm	.91
	12. Independence	.85
	13. Divergence	.70
	14. Humour	.86
	15. Teacher talk	.94
	16. Homework	.87

From a review of Table 4.1, it is revealed that 14 of the 20 correlations are strong ($r = .80$), with the factor labelled "discussion" the lowest ($r = .65$). Correlation coefficients that are low or near zero values indicate weak relationships and scores near either positive 1 or negative 1 indicate a strong relationship (Cohen & Manion, 1989).

The *Class Activities Questionnaire (CAQ)* supported test-retest reliability coefficients and although the pilot study for the *Class Activities Questionnaire (CAQ)* was based on students involved in independent study, an alpha coefficient (Alpha = .689) was reported based on the results of another (n=365) sample (Steele, 1981). The item analysis of the *Class Activities Questionnaire (CAQ)*, determining the validity of the instrument, is consistent with the stated procedure

(Hansen, 1988) and the item total correlation table can be found in *Appendix C*. The item analysis demonstrates that 26 of the 27 items correlated positively with the total scores on the *Class Activities Questionnaire (CAQ)* - see *Appendix C*. The item-dimension correlations showed also that the items were appropriately placed with the dimension for which they were intended - see *Appendix C*. The sample population and the validity checks for the *Class Activities Questionnaire (CAQ)* presented by Steele (1981) are sufficient for establishing validity for using the instrument in this study. Hansen (1988) reports that an alpha reliability coefficient of (Alpha = .69) was reported for the total instrument indicating internal consistency.

The *Class Activities Questionnaire (CAQ)* is useful in identifying teaching skills and behaviours that are appropriate in teaching gifted and talented students and the State of Illinois Gifted Program accepted the standards outlined by Steele (1981) as appropriate for use with gifted education programs (Steele, 1981).

The indicators identifying teaching skills and behaviours appropriate to teaching gifted students as found on the *Class Activities Questionnaire (CAQ)* are:

- student involvement and enthusiasm (items 19 and 24)
- intellectual atmosphere (Item 24)
- higher thought processes (Items 3 and 13, 7 and 12, 11 and 23, 2 and 20)
- independence (Item 14)
- divergence (Item 17)

The *Class Activities Questionnaire (CAQ)* is a self-report questionnaire that was designed to be completed by both the teacher and a class of students. Whilst it is

reported that the teacher has an error rate in assessing the instructional climate when using this instrument, the error rate is quantifiable as it may "...be difficult to be objective about oneself..." (Steele, 1981, p. 13). The *Class Activities Questionnaire (CAQ)* was adapted and used in the present study to identify factors of the climate in the classroom. The teacher, however, was not asked to complete the questionnaire in this study due to the poor error rate reported in the pilot study validating the instrument (Steele, 1981). It is conceded that the responses of the teacher may have assisted in a re-assessment of the planning and management of the particular teacher's classroom - however, this was not a purpose of the study. The purpose was to measure student perceptions of the classroom climate.

Summary of Instruments

There were four steps in the development of the instruments used in this study. Firstly, a draft of the instruments (as revised and adapted by the researcher to meet specific cultural norms in Australia) was reviewed by a Professor in Gifted Education, a lecturer in educational research methodology and post-graduate students studying a Master of Education subject (Educational Research Survey and Design). Secondly, a pilot study was conducted using the instruments. Finally, refinements were made to the instruments as a result of the pilot study and in preparation for final use. These three steps in developing the instruments are in accordance with educational research methodology (de Vaus, 1995).

4.3 METHODOLOGICAL CONSIDERATIONS

"Four conditions which are generalisable to most educational research have to be favourable to make an educational research experiment feasible...First, there has to be sufficient time to design and set up the study and sufficient opportunity for the treatment to show its effectiveness...Second, the financial, physical and personnel resources must be available to carry out the study...Third, there has to be a criterion measure which can be observed consistently among observers and which it is hypothesised that the treatment will affect...Fourth, and most important, for a randomised experiment the subjects must be able to be allocated to treatment groups and treatment to subjects' groups" (Asher, 1976, p. 39).

The three groups of teachers who participated in this study were all volunteers and the responses regarding their reasons for being willing to participate highlight the differences between the participants and non-participants in this study. It should be noted, therefore, that volunteer bias and [in]equivalence of groups is a concern in the methodological considerations of the present study. It must also be stated that as the participants in this study were volunteers, this study used a 'posttest only' design as no comparison of groups was made before the treatment (training in gifted education). It can not be assumed, therefore, that the only difference between the three groups was training and other differences might have emerged if information had been collected 'pre-training'. Efforts to minimise the effects of volunteer bias and pre-treatment differences between the groups are described in detail later in this section.

The Certificate of Gifted Education (COGE) at the University of New South Wales was developed and conducted in Australia. It was established in response to a Federal government call, in 1988, for more effective training and inservice in gifted

education for Australian teachers (Commonwealth of Australia, 1988). It is an 18 month post-graduate program comprising 75 hours of lectures and seminars spread over three school holiday periods. The participants in the program work with a team of internationally renowned experts in the education of gifted and talented children, led by Professor Miraca Gross of the University of New South Wales. It is an intensive training program designed to equip teachers and administrators with skills that will assist them with the identification of intellectually gifted students and with the skills required to develop curricula and programs so that the students may reach their potential more fully.

The Certificate of Gifted Education is designed to develop practical strategies based on sound theory in specific areas of gifted education. The five COGE strands include models of giftedness; identification of gifted students; differentiating the curriculum; developing programs for gifted students and the social and emotional development of gifted students. Each strand incorporates a written assignment carrying the normal expectations of an academic assessment task at post-graduate level. For example, strand one asks that the teachers conduct research on teachers' attitudes towards giftedness, gifted students and special provisions for the gifted.

There are five assignments required for successful completion of the program. Each assignment is graded according to standard post-graduate academic rigor and expectations. The five assignments (each with a minimum of 2,000 words) coupled with 75 hours of class contact (COGE at UNSW), comprise a demanding and rigorous course work load that ensures that the participants are exposed to the research literature and theory underpinning the education of gifted students. For

example, differentiating the curriculum for gifted students (strand three of COGE) looks at the research of experts in curriculum differentiation (for example, Passow, Van-Tassel Baska, Rogers, Williams etc.) and introduces the *trainees* to models of individualised programming and enrichment paradigms (for example, Tannenbaum, Kanevsky, Maker). This level of training encourages the participants to achieve a solid theoretical background in gifted education and the opportunity to use the theory in a practical application in the assignments and in their classrooms.

The Master of Education subjects in gifted education comprise 28 hours of lectures spread over 14 weeks. The students who enrol in a Master of Education degree course must have an undergraduate degree at a credit grade average or above to enter the program. Courses are taught by Professor Miraca Gross or Dr Katherine Hoekman. The Master of Education subjects in gifted education programs are designed to equip teachers and administrators with the necessary skills to develop practical strategies based on sound theory in specific areas of gifted education. The subjects offered include: Current issues in the education of intellectually gifted children, Curricula and teaching strategies, Developing and evaluating programs and Social and emotional development of gifted children. Successful completion of each subject depends on the demonstration of appropriate academic rigor in the assessment task. It is perceived that the education of the post-graduate students will lead to the development of more appropriate curricula and programs in schools to enable the gifted students to reach their potential.

As indicated earlier, teachers in the study were observed by a *trained* rater who evaluated the teaching skills using the *Teacher Observation Form (TOF)*. The rater training is described later in this Chapter. Findings from the *Teacher*

Observation Form (TOF) were compared for *trained*, *trainee* and *untrained* groups. Five nominated gifted students from some classes of Year 6 and above completed the *Class Activities Questionnaire (CAQ)* to measure classroom climate (n=285). Findings from the *Class Activities Questionnaire (CAQ)* for *trained*, *trainee* and *untrained* groups were compared. Each teacher who participated in the present study completed a *Participant Information Form (PIF)* regarding background experience and training in gifted education. Data from the *Participant Information Form (PIF)* were analysed in relation to teaching skills as measured on the *Teacher Observation Form (TOF)* and in relation to class climate as measured on the *Class Activities Questionnaire (CAQ)*. Correlational analyses were carried out to determine the effect of training on teaching skills and classroom climate.

The Pilot Study

A pilot study was conducted during the first three school terms of 1996 in New South Wales and the Australian Capital Territory Department of School Education (government primary and secondary comprehensive and selective schools), Independent and Catholic primary and secondary school classrooms. The pilot study comprised a *trained* teachers group (n=20), the *trainee* teachers group (n=3) and the *untrained* teachers group (n=20). To elicit participation in the pilot study, letters of invitation were sent during 1995 to all Certificate of Gifted Education and Master of Education (at least two gifted education subjects completed) graduates, past Gifted Education Seminar attendees and current Certificate of Gifted Education students. As mentioned earlier, it must be acknowledged that volunteer bias (using a sample of self-selected participants) and [in]equivalence of groups (comparing two groups of individuals who had self-selected into postgraduate studies [the trained and trainee groups] to a group who had not [the trainee group]

exists in the sample. As no investigation could be conducted into the differences between participants before they initiated their studies in gifted education, it can not be assumed that the only difference between the groups was training in gifted education.

Gifted Education Seminars are held at the University of New South Wales three times a year and coincide with the first day of the Certificate of Gifted Education. The seminars are held during the school holidays and are presented by local and internationally renowned experts in the education of gifted and talented children. The Gifted Education Seminars are designed to equip teachers and administrators with strategies based on sound theory in specific areas of gifted education - for example, models of giftedness and talent, identification of academically gifted and talented students, talent development, curriculum and programming options, the social and emotional needs of the gifted and talented students.

A total of 842 letters was sent inviting teachers who were currently teaching at least five gifted and talented students (in any classroom setting) to participate in the pilot study –see *Appendix E*. The letter clearly explained that no extra lesson preparation was necessary and, in fact, the observers wanted only to observe ordinary lessons that were not specially prepared or altered. The letter asked that the teacher nominate an appropriate time for the observation and stated that the researcher would then contact the teacher to confirm the observation time. The letter concluded by offering appreciation in anticipation of the teacher's participation. The following Table 4.2 indicates the number of letters sent to each group and the replies received.

Table 4.2: Number of letters sent requesting participation in the pilot study and replies received during 1995

Group	Letters sent	Replies	Acceptance	Refusal
Trained	224	23	18	5
Untrained	541	52	36	16
Trainee	77	6	5	1

As will be discussed later, the response rate was poor (9.6%) – as indicated in Table 4.2. However, of those who responded, 73% agreed to participate in the pilot study.

In January 1996, the students enrolled in the Certificate of Gifted Education at the University of New South Wales (a new potential *trainee* teacher group of 48 teachers) were addressed at the conclusion of their introductory lecture and then personally handed a letter to request their participation in the study. Only three responses were received. This group of *potential trainees* again received a letter by post requesting their participation (with an accompanying small gift) in April 1996 and only two responses were received (both were negative). The concept of the small gift (a 'teabag') was to create an incentive to participate through a 'humorous approach to relax' whilst completing the agreement to participate form found at the conclusion of the letter. In July 1996, another letter was sent to this group of potential *trainees* which included another small gift (a complimentary ticket to attend a Gifted Education Seminar). No responses, and consequently no acceptances, were received.

Another 120 letters were sent to the *trained* group in July 1996 with the offer of a half price ticket to a Gifted Education Seminar. Only five responses to this letter

were received. After the above mentioned attempts to find participants in the study, it was decided by the researcher to investigate if the procedures being adopted to recruit participants had the potential for modification as it was necessary to increase the success rate in recruiting participants for the study.

In August 1996, twenty teachers enrolled in the Certificate of Gifted Education at the University of New South Wales were randomly selected to participate in a phone interview to gauge feedback for their non participation in the study. The telephone interview consisted of one question - teachers were asked for a reason why they would not participate in the study. The following Table 4.3 is a summary of responses from a group of 20 randomly selected teachers who were enrolled in the Certificate of Gifted Education:

Table 4.3: Reasons given by potential *trainee* teacher participants for non-participation in the study (n=20).

Didn't read letter / Misunderstood letter / Not currently teaching
Don't teach many classes (hold an executive position at the school)
Appeared to be something "extra" / Laziness
Too busy / Could not organise a time / Too complicated
School does not do anything special for gifted and talented students
Don't teach any gifted students
Problems in the school at the moment
Heavy demand from the school already
Program not working in my class and didn't want to have any feedback
Teachers' time is precious and no time to do this
Work part-time with a range of different classes
New school
Realise I may have 5 gifted students after completing the assignment
Read letter quickly and thought it was not suitable to my situation

Table 4.3 shows the reasons given by potential trainees and at the conclusion of the telephone interviews, it was apparent that the reluctance of teachers to participate in the study was connected to their level of understanding and knowledge of gifted education. It appeared that a clear relationship existed within the group of potential *trainees* which distinguished them from the group of *trained* and the group of *untrained* teachers. In fact, it emerged that whilst a clear distinction was apparent between all three groups of participants (the *trained*, *trainee* and *untrained* teachers), a relationship that bound them as group also existed. The relationship that bound and distinguished them was best described through the *Johari Window* (Luft, 1970). The following explanation of the *Johari Window* (as it has been adapted to the present study and its participants) attempts to explain the reluctance found by the researcher in securing participants for this study.

The Johari Window

The *Johari Window* is model of the 'self' developed in 1955 by two psychologists, Joseph Luft and Harry Ingham, to illustrate relationships in terms of awareness (Luft, 1970). The simplicity of the model enables a person to gain an insight into human relations without having to master complex psychological theories and, as it can accommodate a variety of incarnations of different personalities' traits, the model is versatile and fluid (Strano, Mohan & McGregor, 1989).

According to the *Johari Window*, the total 'self' is composed of four quadrants (open, blind, hidden and unknown) and these four quadrants are further categorised into "known to others and self" and "the unknown to others and self".

Each of the four areas refers to the behaviour and motivation of a person and represents a body of knowledge about that person.

Firstly, the 'open' quadrant refers to behaviour, motivation and information which are known to ourselves and known openly to others. Quadrant two (the 'blind' quadrant) stands opposite the 'open' quadrant' and it is an area which is not known to the self, yet is known to others. It is an area where others can observe something in us that we can not see ourselves - it could, for example, be the inability to make a decision or a propensity to stutter when we are angry (Strano et al., 1989).

The 'hidden' or avoided quadrant represents things that we know ourselves but do not reveal to others. It could be a negative attitude toward others, a hidden agenda or feelings of guilt relating to our own work performance. Finally, the 'unknown' quadrant represent parts of our life that we are unsure of but, although we are unsure of these parts of our life, the potential of the unknown to influence our behaviour, motivation and to affect present and future relationships is apparent. The 'unknown' contains anything that is not consciously known either to oneself or to others and this quadrant can affect choices and performance in both social and professional situations. Later, as an individual learns new things about himself or herself and develops new behaviours there is a shift from the 'unknown' to one of the other quadrants (Luft, 1970).

In the diagrammatic representation of the self, the dividing lines of the *Johari Window* are not fixed in terms of size, content or importance (Luft, 1970). For example, someone who is very open to others might represent himself or herself

as follows:

SELF		
	KNOWN TO SELF	UNKNOWN TO SELF
KNOWN TO OTHERS	OPEN	BLIND
NOT KNOWN TO OTHERS	HIDDEN	UNKNOWN

Leaders, especially in education, need an introspective look at themselves to become more self aware, productive and effective. Through self-reflection and an identification of 'self', certain professional achievements and needs for professional development become obvious. The understanding of self together with the identification of professional development needs provides a motivation for interpreting the perspective of self through the *Johari Window* for the three groups of participants in this study.

After many attempts to engage participants in the present study, it became apparent that the behaviours and motivation of the potential groups of teachers fitted into the *Johari Window*. As other disciplines had adapted the *Johari Window* for use in their understanding of human relations, it seemed appropriate to adapt the *Johari Window* to relate to the teacher training model in gifted education as is shown in Table 4.4.

Table 4.4: The *Johari Window* (adapted to relate to training in Gifted Education)

SELF			
		KNOWN TO SELF	UNKNOWN TO SELF
KNOWN TO OTHERS	OPEN I know that I know about Gifted Education (TRAINED)	BLIND I don't know that I know about Gifted Education (UNTRAINED) (pre-training)	
	HIDDEN I know that I don't know about Gifted Education (TRAINEE)	UNKNOWN I don't know that I don't know about Gifted Education (UNTRAINED)	
NOT KNOWN TO OTHERS			

According to the above adaptation of the model (Table 4.4), the *trained* teachers' group was represented in the first quadrant openly stating that 'I know that I know about gifted education'. The *trained* group were, therefore, *more* willing to participate in the study because they know that they know about gifted education.

The *untrained* group were also more willing to participate because they did not know that they did not know about gifted education. Many of the teachers

approached to participate in the study from the *untrained* group had no more than a one hour school-based inservice in gifted education, yet they were responsible for teaching gifted students. The request to participate was not threatening to them as teachers as, from the viewpoint of the *Johari Window*, they did not *really* know that they did not know about gifted education or the gifted students. The significance is that the *untrained* group were willing to participate because the observation carried no meaning for them nor appeared to have any implications on their present or future role as a teacher.

Contrary to the *trained* and *untrained* groups, were the *trainees* who were not willing to participate in the study. The *trainee* group were aware of how much they didn't know and, therefore, were reluctant to participate as they had already recognised that they required further development (known to self) and so chose to undertake specialised training in gifted education. The *trainee* group were, therefore, becoming more aware (they now knew) that they did not know about gifted education.

In reviewing the adaptation of the *Johari Window*, it could be explained that the *trainee* group firstly viewed their understanding of gifted education through quadrant two (the 'blind') - 'I don't know that I know about gifted education'. This view may have occurred before training and may, in fact, have been instrumental in their decision to embark upon training in gifted education. The *trainee* group, located in the hidden quadrant of the *Johari Window*, became more self aware as the training progressed and were more confident in their ability to meet the needs of the gifted student.

The researcher in this study found that the reasons given during the telephone interview for the *trainee* group's non-participation in the study, assisted in the link between the *Johari Window* and the teachers' reluctance to participate. Their responses and the utilisation of the *Johari Window* highlight that there are differences between the participants and non-participants in this study. The specific nature of the differences was not investigated in the present study and it was not possible to minimise volunteer bias due to the extreme difficulty of recruiting participants, which has been described in detail in Section 4.4. The representation of the *Johari Window* in relation to the behaviours and motivation of this study's sample will be further discussed in Chapters Six and Seven.

Main Study

A further 389 letters inviting teachers to participate in the study were sent in October 1996 and again during 1997 to all Certificate of Gifted Education and Master of Education (specialising in gifted education subjects) graduates, past Gifted Education Seminar attendees and to all current Certificate of Gifted Education students. Table 4.5 indicates the number of replies received.

Table 4.5: Number of letters sent requesting participation in the main study and replies received during 1996 and 1997

Group	Letters sent	Replies	Acceptance	Refusal
Trained	230	42	30	12
Untrained	20	10	10	0
Trainee	139	11	9	2

As indicated in Table 4.5, the response rate was much improved (16.2%) which may have been the offer of a small gift - a 'no cost' inservice at the teacher's school. Of those who responded 78% agreed to participate.

In February 1998, 20 *trained*, 20 *untrained* and 20 *trainees* were randomly selected to again participate in a telephone interview to further gauge feedback for their non-participation in the study - see *Appendix E* for interview schedule. The interview schedule was developed according to the following four steps: Step 1, question generation; Step 2, draft of questions reviewed by research supervisors and a lecturer in educational research methods; Step 3, trialling of draft interview questions; Step 4, refinement of the interview schedule for use with participants (de Vaus, 1995). The rationale for this telephone interview was to assess applicability of the researcher's concept of the *Johari Window* to these three groups of teachers and to perhaps modify the approach and gain further insight into the teachers' reluctance to participate. Question a) asked again the main reason for non-participation in the study and the results are shown in Table 4.6.

Table 4.6: The five most common reasons given for not participating in the study gathered from a telephone interview:

Trained n=20	Untrained n=20	Trainee n=20	Reason
12	15	13	Didn't read letter / Misunderstood letter
4	1	2	Don't teach any gifted students
1	3	1	Teacher's time is precious and no time to do this
2	1	4	Too busy / Could not organise a time
1	0	0	Too complicated

Table 4.6 does not indicate the response to question b and c. Question b and c asked if the teacher would have agreed to participate in the study if offered an

incentive or if observed in a less formal teaching environment – see *Appendix F* for the interview schedule. The response to questions b and c was predominantly 'no'. All 60 teachers interviewed agreed with question d - that demands on teachers' time was high. The results of the telephone interview did not differentiate between the three groups but offered an insight into why teachers were unwilling to participate. It appeared that 'time' was a factor as the request was viewed as something 'extra' to do beyond their teaching duties. The results of this second telephone interview are revealed in Table 4.7.

Table 4.7: Results of questions asked about not participating in the study gathered from a telephone interview:

	Trained (n=20)	Untrained (n=20)	Trainee (n=20)
Question a	see Table 4 .6	see Table 4 .6	see Table 4.6
Question b	no = 18 yes =2	no = 19 yes = 1	no = 20 yes =0
Question c	no =18 yes =2	no =20 yes = 0	no = 20 yes = 0
Question d	no = 0 yes =20	no = 0 yes =20	no =0 yes =20

Table 4.7 indicates that even if offered alternatives, the teachers were not willing to participate in the study. The sample for the study was enhanced when those who volunteered were requested to recruit at least another two teachers from their school to participate. The offer of a 'no-cost' inservice in gifted education to any school who managed to recruit at least two teachers from their school was a success and the remaining teachers, sought by the researcher to participate in the study, were found. Whether or not these volunteers were different in important ways from those who were unwilling to participate was not investigated by the

researcher and it must be acknowledged that these 'pre-treatment' differences may or may not have altered the findings of the present study.

Finally, after a long journey to gather participants for the study, a total of 167 teachers participated - see *Appendix E* for a summary schedule of when and how participants were gathered for the study. The *trained* teachers (n=56), the *trainee* teachers (n=31) and the *untrained* teachers (n=80) were evaluated by raters using the *Teacher Observation Form (TOF)* to assess teaching skills and the classroom climate was assessed using the *Class Activities Questionnaire (CAQ)* during a normal teaching period (anything from 35 - 70 minutes). A normal teaching period refers to a regular or scheduled class that the teacher had timetabled by the administration. In eastern Australian schools, these teaching periods in secondary school last anywhere from 35-70 minutes and in primary schools they last approximately 30 minutes. During this normal teaching period, a rater completed the *Teacher Observation Form (TOF)*, the *Class Activities Questionnaire (CAQ)* was completed by five identified gifted students in sample of Year 6-12 classes and the teacher completed a *Participant Information Form (PIF)* to gather background experience about the teacher.

4.4 RESEARCH DESIGN

"Information and the interpretation of the results of a study still depends on the quality of the comparisons in an experiment" (Asher, 1976, p. 111).

The study has considered a quantitative variable, specialised teacher training, which is dominant within the literature (Feldhusen & Hansen 1987; Hansen, 1988; Hansen & Feldhusen, 1994) along with the qualitative variable, teacher characteristics, that is significant in the research (Bishop, 1968; Feldhusen, 1985; Hansen, 1988; Maker, 1975; Silverman, 1980). From a methodological perspective, the basis for the descriptive research design requires both quantitative and qualitative variables to be tested (Cohen & Manion, 1989; de Vaus, 1995; Neuman, 1997). In the present study, training was determined as a quantitative variable, however, pre-treatment differences in teaching skills or attitudes towards teaching in the present study's sample were not determined by any demographic information collected. The study used a 'posttest only' design which did not allow for a comparison of the groups before the treatment (i.e. training).

As previously mentioned, the present study was preceded by and is based on a similar American study undertaken by Hansen (1988) who observed 19 *untrained* and 54 *trained* teachers of gifted students in Indiana to measure the effectiveness of teacher training and how it correlated with observable teaching skills and classroom climate. Hansen (1988) observed classroom teachers teaching gifted students and trained raters assessed the level of 12 items of teaching skills on the Teacher Observation Form (TOF) suggested that *specialised training* (in meeting the needs of gifted and talented students) is an influential variable that accounts for more effective teaching skills and develops more positive classroom climates in

teachers who have undertaken such training than the teachers who did not undertake such training. Hansen (1988) also found that the success of an educational program in a school depends heavily on the effectiveness of the teacher, and the effectiveness of the teacher depends heavily on the experience of specialised training in the teacher training program. She concluded that studying the teacher of the gifted has increased our knowledge of the skills that characterise an effective teacher of gifted children either in the regular classroom or in special settings (Hansen, 1988). The present study was an exploratory study as it looked at three groups (Hansen, 1988, looked at two groups) and it was a larger sample size (Hansen, 1988 was $n=73$ and the present study was $n=167$). Any generalisations emanating from the findings of the present study would have to take these differences into account.

The choice of design, sampling strategies, procedures and techniques for data analysis for the present study is well supported by the research literature (e.g. Cohen & Manion, 1989; de Vaus, 1995; Neuman, 1997). The observation methods described in the present study were adopted from more than four decades of observational studies of 'practitioners' teaching (Everston & Green, 1986; Gage, 1972; Remmers, 1963; Rosenshine & Furst, 1973; Shavelson, Webb & Burnstein, 1986). This method of observation has its foundation in an interpretative view of teacher education research, taking into account the perspective of research that discovers, builds theory and is grounded in the everyday experience of the participants (Keeves, 1997; Stevens, 1986). The design for the present study reflected methods used by Hansen (1988) and, as this study was a quasi-replication of Hansen's (1988) study, it was important to represent the methods closely so as to compare results across the two studies.

As mentioned earlier, the present study used an experimental research design. Descriptive research identifies and interprets existing trends and relationships between identified variables in an experiment (de Vaus, 1995). The sampling strategy for the present study investigated three groups from an underlying population i.e. teachers, at different stages in a treatment process – those *untrained*, *in training* and *trained* in gifted education. While controlling the setting for the groups and giving only one treatment (for example, training in gifted education), it is usually concluded that any differences found between the groups is due to the treatment (Neuman, 1997). As all participants in the sample were volunteers and no data was collected it must be acknowledged that volunteer bias and [in]equivalence of groups existed in the sample of the present study. The drawing of a random sample of subject and random assignment of subjects to groups would have been desirable (Asher, 1976).

The procedures and techniques used in the design of the methodology are described in detail in section 4.8 of this Chapter.

The additional task that this study has chosen to address, in practical terms, is the tension between theory and practice by surveying gifted students about the classroom climate of 'expert' and 'novice' practitioners. The study responds to the need to establish some generalisations about teaching skills in an area of educational research concerned with the effectiveness of teacher training in specialised areas (the process) and the measurable achievement of that training in the success of the learning (the product).

4.5 CHARACTERISTICS OF THE SAMPLE

"The grouping and treatment processes of research are not unlike a school's operations...Allocation of subjects to groups, maintaining the groups under differing learning conditions, and assessment of the condition of the subjects after a period of time is a part of standard practice in formal educational systems" (Asher, 1976, p. 38).

The study was carried out in Department of School Education schools (government comprehensive schools, either single gender or coeducational); independent (private) schools; and Catholic Education System schools both in the primary and secondary sectors. All schools were located in New South Wales and the Australian Capital Territory, Australia. The following Table 4.8 shows the number of males and females (by training groups) who participated in the study. Between 1996 and 1998, 10 *trained* raters observed a total of 167 teachers teaching in 87 different primary and secondary schools. Pre-treatment differences in the sample used in the present study were not determined by demographic information collected.

Table 4.8: Frequency of males and females by training (n=167)

	Trained (n=56)	Untrained (n=80)	Trainee (n=31)	Total
Male	17	19	3	39 (23%)
Female	39	61	28	128 (77%)

Table 4.8 shows that there were more female than male teachers in the sample – this is representative of the number of female and male teachers currently teaching in NSW schools. The population enrolling in Certificate of Gifted Education at the University of New South Wales is also representative of the teaching population as

demonstrated by the following table 4.9 which shows a comparison between the sample (n=167) and the 1995 NSW Department of Education and Training teacher population:

Table 4.9: Frequency of males and females by program at post-graduate level compared to 1995 NSW (DET) population

Gender	Sample	COGE 1991-1997	M.Ed. and M.Ed.(Hon.) 1986-1996	M.Ed. Admin / M.Ed. Ad (Hon.) 1986-1996	Teachers in NSW schools 1995
Male	41 (23%)	73 (22%)	280 (37%)	387 (49%)	36%
Female	126 (77%)	260 (78%)	488 (63%)	406 (51%)	64%

Table 4.9 confirmed that the proportion of males and females in the sample were representative of the existing teaching population and those who enrol in post-graduate studies at UNSW.

A diversity of classrooms was visited during the teacher observations (rural, city, both socio-economically disadvantaged and advantaged, etc). Teachers were observed teaching a variety of different programs and the following table 4.10 showed the range and frequency of programs being taught during the observations. The total sample is divided thus: 59% mixed ability/whole class enrichment; 36% subject or year acceleration and 5% in self-contained or pull-out programs. Teachers were not asked how many gifted students they had in a mixed ability class. They were invited to volunteer for the study if they had five or more gifted students in the class. The Gagné model, which has become influential in New south Wales, proposes that gifted students comprise 15% of the population

– approximately five students in a class of 30. Thus, teachers familiar with this model might accept the probability of having five or more gifted students in their class.

Table 4.10: Frequency of type of program taught (n=167)

Type of Program	Trained n=56	Untrained n=80	Trainee n=31
Self contained gifted class	28	18	8
Pull-out	5	2	0
Year acceleration	0	0	0
Subject acceleration	3	6	0
Mixed ability	18	51	22
Whole class enrichment	2	3	1

Table 4.10 indicated the range of classrooms visited during the study. The difference between a 'mixed ability' class and whole class enrichment is grouping practices – the students in whole class enrichment are usually ability grouped whereas the mixed ability class is by definition heterogeneous in nature.

The research design attempted to include the full range of year levels in the observation schedule and the table showing the range and frequency of year levels is located in *Appendix H*. As the *Class Activities Questionnaire (CAQ)* could only be completed by Years 6-12, it was vital that these year levels were included in the present study. There was only 38% of the sample in Years 6-12. It was important to the research design that a range of both primary and secondary schools were included in the study and the following Table 4.11 shows the distribution of the sample across the primary and secondary school sectors.

Table 4.11: Frequency of primary/secondary level taught for observation (n=167)

Year level	Trained (n=56)	Untrained (n=80)	Trainee (n=31)
Primary Years (K-6)	40	43	27
Secondary (Years 7-12)	16	37	4

As can be seen in Table 4.11, the majority of teachers observed were in the primary classes.

The demographic data collected on the *Participant Information Form (PIF)* included details of the years of teaching experience held by those participants in the study. Following is table 4.12 showing the mean number of years of regular teaching and teaching experience with gifted students.

Table 4.12: Mean number of years of teaching experience (n=167)

Years	Trained (n=56)	Untrained (n=80)	Trainee (n=31)
Years of regular teaching experience	13.04	12.23	9.20
Years of gifted teaching experience	7.91	5.53	3.65

Table 4.12 showed that the *trained* teachers had slightly more years of regular teaching experience and years teaching the gifted students (approximately 21 years) than the *untrained* teacher (17.75 years) or the *trainee* teachers (12.85 years).

Included in the background data collected on the *Participant Information Form (PIF)* were details of the number of hours per week participants in the study spent

in contact (either in formal class or other settings) with gifted and talented students. Although the data on this background variable were collected, no statistical analysis was carried out on its association with teaching skills or classroom climate. Following, however, is a frequency table (table 4.13) showing the number of hours spent in contact with gifted and talented students each week.

Table 4.13: Frequency of hours per week contact time with gifted students (n=167)

Hours of contact with gifted students per week	Trained n=56	Untrained n=80	Trainee n=31
0-1 hours	5 (9%)	17 (21%)	5 (16%)
2-4 hours	4 (7%)	15 (19%)	4 (13%)
5-10 hours	18 (32%)	21 (26%)	7 (22%)
11-20 hours	11 (20%)	9 (11%)	4 (13%)
21-25 hours	9 (16%)	6 (8%)	9 (30%)
26-30 hours	8 (14%)	5 (6%)	1 (3%)
30 plus hours	1 (2%)	7 (9%)	1 (3%)

Table 4.13 shows that 49% of the *trainee* teachers, 32% of the *trained* and 23% of the *untrained* spent 11-30 plus hours per week with the gifted students.

Following is Table 4.14 showing participants' future intention to pursue formal training in gifted education. No data were collected from the *trained* teacher's group as their intention to engage in formal training in gifted education was realised by their completion of either the Certificate of Gifted Education or the two units specialising in gifted education in the Master of Education degree program.

Table 4.14: Frequency of intention to pursue training in gifted education (n=111)

	Untrained (n=80)	Trainee (n=31)
Yes	32 (40%)	31 (100%)
No	48 (60%)	0

Table 4.14 showed that sixty per-cent of the *untrained* teachers indicated that they would not pursue specialised training in gifted education which supports the previously proposed interpretation of the *Johari Window* - these teachers did not know that they did not know about gifted education.

Table 4.15 follows and shows the participants' satisfaction with their current teaching position.

Table 4.15: Frequency of satisfaction with current teaching position (n=167)

	Trained (n=56)	Untrained (n=80)	Trainee (n=31)
Strongly agree	20 (36%)	22 (28%)	9 (29%)
Agree	29 (52%)	49 (61%)	18 (58%)
Undecided	2 (4%)	6 (7.5%)	3 (10%)
Disagree	5 (9%)	0	1 (3%)
Strongly disagree	0	3 (4%)	0

Table 4.15 indicated that there was no discrimination between the three groups as 89% of the *untrained*, 88% of the *trained* and 87% of the *trainee* were satisfied with their current teaching positions.

A characteristic of successful teachers of the gifted student that has been identified in the literature on desirable teacher characteristics is high intellectual ability. Included in the data collected on the *Participant Information Form (PIF)* were

details of the undergraduate average grade attained by participants in the study. Following is Table 4.16 showing the undergraduate average grade of participants.

Table 4.16: Undergraduate average grade (n=167)

Average grade	Trained (n=56)	Untrained (n=80)	Trainee (n=31)
Pass	6 (11%)	31 (40%)	6 (20%)
Credit	23 (41%)	30 (37%)	14 (45%)
Distinction	20 (36%)	14 (17%)	10 (32%)
High Distinction	7 (12%)	5 (6%)	1 (3%)

The undergraduate average grade of teachers with training in gifted education is somewhat higher than that of the two other groups. Table 4.16 revealed that 48% of the *trained* teachers, 35% of the *trainees* and only 23% of the *untrained* group received a distinction or high distinction undergraduate average grade.

Selection of Teachers

Teachers who agreed to participate in the present study were not made aware of the research questions pertaining to the study. They were told that teachers were sought to assist with a research study which investigated the training of teachers in the field of gifted education, and which required the observation of interactions between teachers and gifted learners in the classroom – see *Appendix E* for copies of the letters sent to participants. The teachers were advised that they would be observed teaching their current class during school time and were asked not to prepare any special lesson as the researcher was interested in observing day by day teaching as it was currently happening in New South Wales and Australian Capital Territory schools. It was emphasised that teachers' commitment would be no more than one hour in total. It was important to

emphasise the teachers' commitment in hours as so much of a teacher's service outside the classroom is in a voluntary capacity.

It was clearly stated that teachers would not be judged or graded in relation to their performance in a way that could affect current or future employment during the observation. They were only judged in relation to the needs of the research study and if feedback was required, then it would be offered at the completion of the observation. It was stated that the observers should not be known to the teachers personally. The raters were teachers currently undertaking post-graduate studies at the University of New South Wales or people who had completed such studies. The teachers were requested to complete the *Participant Information Form (PIF)* and return it to the researcher by mail prior to the observation. The *Participant Information Form (PIF)* asked the participants to indicate the most convenient day and time for the observation to take place.

Selection of Students

The teachers of Years 6 to 12 were asked to select five gifted students in the class to complete a very short survey (5 minutes long) on the classroom climate during the lesson. The *Class Activities Questionnaire (CAQ)* is only suitable for Year 6 and above (Steele, 1981) and, therefore, was not used in the primary K-5 classrooms. The students selected were identified gifted students, and where possible, students were randomly selected by teachers. The frequency of the random selection of students to complete the CAQ was not determined. However, as most students came from a mixed ability classroom, and according to the Gagné (1995) model there would be approximately 5-7 gifted students per group of 32 in an average classroom, it can be assumed that the random selection of

students was not common. It must be acknowledged, therefore, that selection bias exists in the sample of students selected for the survey instrument measuring class climate in the present study. The identification procedures for gifted students varied from school to school and it was not possible to find any common identification process and therefore, there were no common criteria identified by teachers in their selection of the students. It should be noted that all schools had access to the *1991 New South Wales Department of School Education strategy for the education for gifted and talented students* which outlines identification procedures to be used in schools. Therefore, the issue of non-standardised identification procedures will be discussed in Chapter Six.

A sample of 285 students completed the *Class Activities Questionnaire (CAQ)*; 90 from classes taught by the *trained* group, 175 from the *untrained* group and 20 from the *trainee* group. The survey is designed to describe the instructional climate in classrooms containing gifted and talented students. The results of the *Class Activities Questionnaire (CAQ)* were reviewed to compare classroom climate of *trained*, *trainee* and *untrained* teachers of gifted and talented students. As outlined earlier, four dimensions are measured on the *Class Activities Questionnaire (CAQ)* - lower thought processes, higher thought processes, classroom focus and classroom climate.

4.6 SELECTION AND TRAINING OF RATERS

"Reliability is repeatability, or more formally, replicability" (Asher, 1976, p. 93).

Raters were selected from Master of Education (specialising in gifted education subjects) and Certificate of Gifted Education (University of New South Wales) enrolled students or graduates. The Professor in Gifted Education at the University of New South Wales, Professor Miraca Gross, nominated a selection of suitable raters to observe and evaluate teachers of gifted students. Some of the raters were enrolled in gifted education subjects in the Master of Education, Master of Education (Hon.) and Ph.D. programs at University of New South Wales. Each rater had completed a minimum of two gifted education subjects in the Master of Education program, with the average being four subjects completed.

Ten raters (eight females and two males) were selected and trained during three training sessions in 1995 and 1996 – see *Appendix G* for details of the training sessions. Eight of the ten raters held a Master of Education (gifted education). One rater held a Certificate of Gifted Education (University of New South Wales) and one held both a Certificate of Gifted Education (University of New South Wales) and a Master of Education (specialising in gifted education subjects). Three of the 10 raters were University of New South Wales staff and the other seven were working in New South Wales schools; two as teachers, three as gifted and talented student co-ordinators and two as subject co-ordinators. Each rater had between one and seven years teaching experience with gifted students – see *Appendix G* for details of the raters' background.

Each rater attended at least two four-hour training sessions during which they became familiar with the *Teacher Observation Form (TOF)*; the purpose of the observation; the role of the observer and the procedure for going into classrooms – see *Appendix G* for details of the observation guidelines and protocols. The raters were trained to rate teachers' interactions with all students in the classroom and each item on the *Teacher Observation Form (TOF)* was rated in terms of its appropriateness for effective teaching. In some cases, the classes were self-contained gifted classes so the raters were observing the teaching skills of teachers working exclusively with an ability-grouped class of gifted and talented students. The 12 items on the *Teacher Observation Form (TOF)* contained a checklist of criteria and when the rater observed one or more of these criteria they were able to rate the teaching skill accordingly. It must be acknowledged that items like item 2 “clarity of teaching” which contained the criteria “communication skills and sufficient examples given” would be readily observable in each classroom interaction. However, item 12 “learning aids” may not have been obvious or observable in each classroom interaction and that is why the *Teacher Observation Form (TOF)* allowed for the ‘not observed’ box to be marked by the rater.

During the training, the raters discussed items on the *Teacher Observation Form (TOF)* and participated in training activities to gain experience in using the instrument. These training activities included a simulation of a classroom observation which involved viewing videos of *trained*, *trainee* and *untrained* teachers in gifted education teaching average ability and gifted children in a variety of Australian classrooms. After viewing the videos, the raters discussed the range of responses in order to come to agreement regarding teacher behaviours which

would merit specific rankings. Each observation was a normal teaching period (secondary students ranged from 30-50 minutes) and primary ranged from 30-40 minutes in length (the mean length of time was 35 minutes). Raters used the *Teacher Observation Form (TOF)* during the training session to evaluate the teacher whilst viewing different classes on video. Each teacher was observed on 10 occasions, once by each of the 10 raters during the training session. Raters were not told whether the teachers they were observing were *untrained*, *trainees* or *trained*. Each rater completed the *Teacher Observation Form (TOF)* individually and then the group discussed and compared the ratings allocated.

Prior to the researcher collecting data for her study, it is standard practice that observers are trained to use the specifics of the time sampling techniques with the categories of behaviour under study and then for the researcher to assess reliability (Huck, Cormer & Bounds, 1974). Methods for reporting observer reliability vary; however, the most common method is to collect observation data from two or three observers during the same session in which the study occurs. The researcher then determines the degree of agreement between the observers by reporting the average percentage (with the range) of agreement for each item on the test scoring (Huck et al., 1974).

The inter-rater reliability was assessed after the rater training sessions by the researcher in the present study – see *Appendix G* for a sample of rater results in the practice exercises in the three training sessions. During the rater training, the

raters practised rating teachers by identifying the teaching skill listed under each item. It was important to establish the inter-rater reliability to enhance the validity to the study (Asher, 1976). A measure of internal consistency was achieved by summing the scores on the *Teacher Observation Form (TOF)* for each rater and then calculating the mean of the scores. The lowest mean was 42.5 and the highest was 53.6. The mean percent of agreement overall for all 12 items was 81% (with a range of 72% to 89%) and Table 4.17 shows the results of the inter-rater reliability in the final practice exercise of the rater training.

Table 4.17: Responses of Raters on practice exercise from the final training session using the *Teacher Observation Form (TOF)*. (Total possible score on each item = 5 with the n/o = 0)

TOF Item	1	2	3	4	5	6	7	8	9	10	11	12
Rater												
1	5	5	4	4	N/o	N/o	N/o	N/o	4	N/o	4	5
2	5	5	4	4	N/o	N/o	N/o	N/o	4	N/o	4	5
3	5	5	4	4	N/o	N/o	N/o	N/o	4	N/o	4	5
4	5	4	4	4	N/o	N/o	N/o	N/o	3	N/o	4	5
5	5	5	4	4	N/o	N/o	N/o	N/o	3	N/o	4	5
6	5	5	4	4	N/o	N/o	N/o	N/o	3	N/o	4	5
7	5	4	N/o	4	N/o	N/o	N/o	N/o	3	N/o	4	5
8	5	4	3	4	N/o	N/o	N/o	N/o	3	N/o	4	5
9	4	4	3	4	N/o	N/o	N/o	N/o	3	N/o	4	5
10	5	4	3	4	N/o	N/o	N/o	N/o	3	N/o	3	4
				*	*	*	*	*		*		

* 1.00 consistency of response among all 10 raters

The results of inter-rater reliability shown here in Table 4.17 demonstrate the internal scoring consistency of the group of raters after completing the final practice

session of the rater training. As mentioned previously, a summary of results after each training session is detailed in *Appendix G* and shows the development of inter-rater reliability as a result of the rater training.

The mean scores were compared amongst raters at the conclusion of the pilot study (n=43) and Table 4.18 shows the results of the composite scores on the *Teacher Observation Form (TOF)*. The composite score is the score of each of the 12 items summed. The lowest mean was 40.0 and the highest was 49.0. The mean percent of agreement overall for all 43 participants was 75% (with a range 67% to 82%).

Table 4.18: Mean scores of Raters on Pilot Study using the *Teacher Observation Form (TOF)*. n=43 (Total possible score on each item = 5)

Rater	Number of obs. Trained (n=20)	Mean of Obs. (x)	Number of obs. Untrained (n=20)	Mean of obs. (x)	Number of obs. Trainee (n=3)	Mean of obs. (x)
1	10	40.90	10	48.66	1	49.00
2	6	53.00	3	43.00	1	51.00
3	1	45.00	3	39.66	0	
4	0		3	40.00	0	
5	1	48.00	0		1	50.00
6	0		1	47.00	0	
7	1	44.00	0		0	
8	1	43.00	0		0	
9	0		0		0	
10	0		0		0	
Total Mean	N=43	45.65		43.66		50.00

Table 4.18 shows the number of observations carried out by each rater in the pilot study (n=43) and also shows the mean of the composite score of the *Teacher Observation Form (TOF)*. As it is shown in Table 4.18, raters 9 and 10 did not rate

any participants in the pilot study. Raters 6, 7 and 8 only 1 participant each; rater 5 conducted 2 observations; rater 4 rated only 3 participants; rater 3 rated 4 participants and rater 2 rated 10 participants. Rater 1 rated 21 participants and, therefore, the rater reliability required further establishment as Rater 1 was the researcher and conducted a higher percentage of the teacher observations in the pilot study. To assess whether or not the scores from the observations of rater 1 disproportionately influenced the mean, the scores from other raters' observations were averaged and compared to that of rater 1. The mean score of observations of raters 2 through to 8 was 46.5 indicating consistency with the averaged mean score of 46.2 by rater 1. The mean score for Rater 1 was only slightly different to the total mean score of the other seven raters. This demonstrates the inter-rater reliability between Rater 1 and the other seven raters.

4.7 HYPOTHESES

"A null hypothesis is one which declares that there is no difference among two or more groups on a variable, or that there is no relationship between two variables within a group" (Asher, 1976, p.69).

The aim of the study was to investigate whether the effect of training was a significant influence on observable teaching skills and classroom climate. The study aimed to investigate relationships between teacher training programs for teachers of the gifted and actual teaching skills of teachers of gifted students by investigating the extent to which teacher training program goals are correlated with observable skills of teachers of the gifted. Is there is a difference in the way teacher training influences the psychological, demographic or experiential variables and are these psychological, demographic or experiential variables correlated

significantly with observable teaching skills or class climate? From these stated aims of investigation for this study, a set of four research questions emerged and, from the research questions, emerged four hypotheses.

Hypothesis One

Teacher training in gifted education has no significant effect on observable teaching skills.

Hypothesis Two

Teacher training in gifted education has no significant effect on class climate.

Hypothesis Three

No psychological, demographic or experiential variables are correlated significantly with observable teaching skills.

Hypothesis Four

No psychological, demographic or experiential variables are correlated significantly with class climate.

If such relationships between teacher training programs for teachers of the gifted and actual teaching skills of teachers of gifted students can be demonstrated, the value of the variables (as stated in the hypotheses) can be predicted and further explored.

As discussed in Chapter 1, this study assesses the effectiveness of training, which Gagné would analyse as a catalytic variable, on the development of teaching skill – the “potential into performance” paradigm which is at the heart of the Gagné

model. Hypotheses one and two relate to the impact of training on teaching skills and classroom climate. The inclusion of the *trainee* group permits the researcher to observe the degree of improvement in teachers who were in the process of developing their potential as teachers of the gifted into performance.

The independent variable for hypotheses one and two was training in gifted education - either *trained*, *trainee* or *untrained*. The dependent variables were teaching skills (the composite score of the *Teacher Observation Form*) and classroom climate (the composite score of the *Class Activities Questionnaire*).

The independent variables for hypotheses three and four were: gender; training in gifted education; year level taught for the observation; type of program currently teaching; years of regular teaching experience; years of teaching experience with gifted and talented students; a desire to pursue training in gifted education; undergraduate average grade; support for educational programming for gifted and talented students; currently teaching in specific subject area and satisfaction with current position as a teacher.

The dependent variables for hypotheses three and four were teaching skills (the composite score of the *Teacher Observation Form*) and classroom climate (the composite score of the *Class Activities Questionnaire*).

4.8 SUMMARY

"Information and the interpretation of the results of a study still depend on the quality of the comparisons in an experiment" (Asher, 1976, p. 111).

Firstly, each rater completed a Rater Questionnaire regarding their training and experience. Before or after the observation, each teacher completed a *Participant Information Form (PIF)* to collect data on the demographic of the school and experience and background of the teacher participating in this study. Each teacher was observed while teaching a group of students (including at least five identified gifted students) in a variety of programs – either whole class enrichment, mixed ability, pull-out program etc. The teacher was evaluated by a trained rater using the *Teacher Observation Form (TOF)*. Teachers of Years 6 to 12 above selected five identified gifted students to complete the *Class Activities Questionnaire (CAQ)*.

As mentioned in the previous section, the independent variable for hypotheses one and two was training in gifted education - *trained*, *untrained* and *trainee*. In this study a planned contrast approach was adopted. 'A priori' comparison testing – a planned comparison using individual t-test between pairs of groups – was employed in the analysis of the results. Student's T-test was used to compare the total scores (all items summed) for *trained*, *trainee* and *untrained* teachers on the *Teacher Observation Form (TOF)* and *Class Activities Questionnaire (CAQ)*. A one-way analysis of variance (ANOVA) was calculated to observe whether any significant sources of variances existed between the groups for the total scores of the *Teacher Observation Form (TOF)* and the *Class Activities Questionnaire (CAQ)*.

The questionnaire survey *Class Activities Questionnaire (CAQ)* that could be scored for positive and negative responses to obtain a single numeric score, was used by a sample of identified gifted and talented students from a sample of teachers' classrooms in Years 6 to 12. The observational checklist (*TOF*) that could be scored on a five point Likert scale to obtain a single numeric score, was used by raters to assess teacher effectiveness in classrooms of those teachers teaching gifted and talented students. The value of the single numeric score from both the *Class Activities Questionnaire (CAQ)* and the *Teacher Observation Form (TOF)* could be analysed statistically with respect to the chosen variables of the school and teacher's background information collected on the *Participant Information Form (PIF)*. Variables such as gender, courses taken in gifted education at post-graduate level etc. were identified from the *Participant Information Form (PIF)* to see if there were any relationships or associations with teaching skills (total score of the *Teacher Observation Form - TOF*) or classroom climate (total score of the *Class Activities Questionnaire - CAQ*).

The qualitative data were collected from the *Class Activities Questionnaire (CAQ)* from students' responses to three open-ended questions which asked students to comment on three things they liked about the class and three things they would like to change about the class. There was also an open-response comment area for students to add anything else about the class that they chose. While this type of qualitative data provides a great deal of flexibility in response (Cohen & Manion, 1989), it is more difficult to interpret and tabulate than the quantitative data and so, was not analysed statistically by the same methods as the quantitative data. It was, however, useful for clarifying some of the quantitative data and provided

supportive information that was not gathered by the scored components of the *Class Activities Questionnaire (CAQ)*.

Student's T-test was used to compare means and standard deviations between the *trained*, *trainee* and *untrained* groups on the four dimensions or subscales of the *Class Activities Questionnaire (CAQ)* - lower thought processes; higher thought processes, classroom focus and classroom climate. Cross tabulation (CROSSTABS) was calculated to investigate the extent of the differences between the *trained*, *trainee* and *untrained* groups on the four dimensions or subscales of the *Class Activities Questionnaire (CAQ)*.

Pearson product correlations were calculated to determine the strength of the relationships between background variables as recorded on the *Participant Information Form (PIF)* and the total scores of both the *Teacher Observation Form (TOF)* and the *Class Activities Questionnaire (CAQ)*. Contrast tests were calculated to determine the strength of the relationships between background variables as recorded on the *Participant Information Form (PIF)* and the total scores of the *Teacher Observation Form (TOF)*. The following Chapter details the results of these data analysis procedures.

PART FOUR: RESULTS

CHAPTER 5

RESULTS

5.1 DATA ANALYSIS

"...by teasing out simple relationships between factors and elements deemed to have some bearing on the phenomenon in question..." (Cohen & Manion, 1989, p. 154).

The data of the *Teacher Observation Form (TOF)* and the *Class Activities Questionnaire (CAQ)* were analysed to test hypotheses one and two. The independent variable was training in gifted education - *trained, untrained* and *trainee*. Analyses were carried out to investigate the contrast between groups and the associations between the dependent and independent variables. The dependent variables as stated in hypotheses one and two were teaching skills (the composite score of the *Teacher Observation Form - TOF*) and classroom climate (the composite score of the *Class Activities Questionnaire - CAQ*). All data collected on each individual item was examined using the conventional measures of central tendency: mean, median, mode, skewness and kurtosis. As mentioned earlier, a planned contrast approach was adopted. 'A priori' comparison testing – a planned comparison using individual t-test between pairs of groups – was employed in the analysis of the results. The use of 'a priori' comparison testing alleviated the need for a post-hoc analysis.

Student's t-test was used to compare the total scores (all items summed) for *trained*, *trainee* and *untrained* teachers on the *Teacher Observation Form (TOF)*. 'Bonferroni t' (Dunn's test), as a more conservative level of significance for each comparison, was used in the reporting of the results in this Chapter. The 'Bonferroni t' (Dunn's test), is appropriate to the design of this study because a more conservative level of significance (specifically, $.005/2 = .025$ rather than $.05$) is used. If difference was found between the sample size of two groups the adjusted computation of degrees of freedom was used for the t-test. A one-way analysis of variance (ANOVA) was calculated to find if any significant sources of variance existed between groups for the total scores of the *Teacher Observation Form (TOF)*. Items were identified by a principal components analysis with alpha reliability coefficients being calculated within the three groups for the *Teacher Observation Form (TOF)*. Factors were extracted using scree test and eigenvalue specifications of greater than 1.0 and, in most cases, were rotated using varimax rotation to report factor loadings with an absolute value greater than .33 (de Vaus, 1995) being reported for the *Class Activities Questionnaire (CAQ)*.

Student's T-test was used to compare means and standard deviations between the *trained*, *trainee* and *untrained* groups on the four dimensions or subscales of the *Class Activities Questionnaire (CAQ)* - lower thought processes; higher thought processes, classroom focus and classroom climate. Cross tabulation (CROSSTABS) was calculated to investigate the extent of the differences between the *trained*, *trainee* and *untrained* groups also on the four dimensions or subscales of the *Class Activities Questionnaire (CAQ)* - lower thought processes; higher thought processes, classroom focus and classroom climate. All analyses executed clearly showed agreement and therefore, the present study ($r = .71$) supported the

reliability of the *Class Activities Questionnaire* ($r = .76$) as determined by Steele (1981) - see *Appendix D*. A one-way analysis of variance (ANOVA) was computed to determine if there were any significant differences between the groups on a combined score of the *Teacher Observation Form (TOF)* and the *Class Activities Questionnaire (CAQ)*.

The first objective of the present study was to compare the teaching skills and classroom climates of those teachers who were either *trained*, currently *undertaking training* or *untrained* in gifted education. These were tested using the procedures outlined above. The second objective of the present study was to investigate the relationship that identified teaching skills and classroom climate had with the psychological, demographic and experiential variables of the teachers in each group according to specialised teacher training in gifted education. The procedures used to test these investigations are outlined below. Pre-treatment differences in the present study's sample were not determined by any demographic information collected. The study used a 'posttest only' design which did not allow for a comparison of the groups before the treatment (i.e. training). The size of the treatment groups varied (*trained* $n=56$; *untrained* $n=80$ and *trainee* $n=31$) and the fact that teachers were teaching different grade levels might also have possibly influenced the results. This, however, could not be controlled for.

A correlation analysis (Pearson product correlation) was carried out to test hypotheses three and four, with the total scores of the *Teacher Observation Form (TOF)* and the *Class Activities Questionnaire (CAQ)* for any pattern of central tendency. Pearson product correlations were calculated to determine the strength of the relationships between background variables as recorded on the *Participant*

Information Form (PIF) and the dependent variables (total scores of the *Teacher Observation Form (TOF)* and the *Class Activities Questionnaire (CAQ)*). The dependent variables were teaching skills (the total score of the *TOF*) and classroom climate (the total score of the *CAQ*). The independent variables for hypotheses three and four were: gender; training in gifted education; year level taught for the observation; type of program currently teaching; years of regular teaching experience; years of teaching experience with gifted and talented students; a desire to pursue training in gifted education; undergraduate average grade; currently teaching in specific subject area; support for educational programming for gifted and talented students and satisfaction with current position as a teacher. Only the results that were significant at the $p < .05$ level were reported. The categorical data (i.e. type of program taught) was treated with the CROSSTABS program to distinguish it from the interval data (i.e. years of teaching experience).

Contrast tests were analysed to determine the strength of the relationships between background variables as recorded on the *Participant Information Form (PIF)* and the dependent variable (total scores of the *Teacher Observation Form (TOF)* and the *Class Activities Questionnaire (CAQ)*).

Three open-response items on the *Class Activities Questionnaire (CAQ)* were analysed, classified and grouped according to affective or cognitive factors as the two categories identified by Steele (1981) - see *Appendix D*. The cognitive and affective factors contain groups of items from the 27 survey items found on *Class Activities Questionnaire (CAQ)*. The groups of items are classified by Steele (1981) into four dimensions – lower-thought processes, higher thought processes,

classroom focus (how students and teachers interact) and classroom climate (student attitudes and feelings). If the student made a comment relating to memory, translation, interpretation then it was categorised as lower-thought processes. If they made a comment relating to, application, analysis, synthesis or evaluation then it was determined as a higher thought process. If the student made a comment relating to discussion, test/grade stress or lecturing then it was determined as classroom focus. Finally, if the student made a comment about enthusiasm, independence, divergence, humour, teacher talk or homework then it was categorised as classroom climate. The qualitative data were categorised by training and the student comments reflect the positive or negative nature of the affective or cognitive factor identified in the three groups of teachers' classrooms.

The results presented in this section are presented in relation to the hypotheses of the present study as detailed in Chapter Two and the methodological considerations presented in Chapter Four. All the statistical analyses were performed using the SPSS VAX / VMS version 4.1 - a statistical analyses software package.

5.2 TEACHER OBSERVATION FORM (TOF) RESULTS

TESTING HYPOTHESIS ONE

"...the ideal pre-service programs include extensive instruction ...in content related to education of the gifted by university faculty well grounded in education of the gifted..." (Davison, 1996, p. 41).

In a comparison of *trained*, *trainee* and *untrained* teachers of gifted and talented students on the *Teacher Observation Form (TOF)*, student's t-tests showed that those teachers specifically *trained* or *undertaking training* in gifted education scored significantly higher than those *untrained* in gifted education on a composite *Teacher Observation Form (TOF)* score. There was no significant difference at the $p < .05$ level of significance between those teachers *trained* in gifted education and those *undertaking training* in gifted education.

A one-way (ANOVA) showed that training was the source of variance for the composite score on the *Teacher Observation Form* [$F(1,167) = 6.88, p < .001$]. The calculations were directed to analyse the differences that existed in each of the three grouped sets. The sets were grouped by using the effect of *training*.

This section explores the analyses performed to test hypothesis one - that teacher training in gifted education has a significant effect on observable teaching skills. The following Table 5.1 shows composite means and standard deviations for *trained*, *trainee* and *untrained* teachers of gifted and talented students for a composite score on the *Teacher Observation Form (TOF)*

Table 5.1 Composite means and standard deviations for *trained*, *trainee* and *untrained* teachers of gifted and talented students for a composite score on the *Teacher Observation Form (TOF)* n=167

TOF Item		<i>Trained</i> n=56		<i>Untrained</i> n=80		<i>Trainee</i> n=31	
		Mean (x)	stan dev. (sd)	Mean (x)	stan dev. (sd)	Mean (x)	stan dev. (sd)
1	subject matter coverage	4.48	.91	2.94	1.19	4.16	.69
2	clarity of teaching	4.48	.66	2.96	1.08	4.29	.64
3	motivational techniques	4.32	.92	2.75	1.19	4.23	.62
4	pace of instruction	4.47	.71	2.70	1.08	4.16	.74
5	student-determined activities	3.82	1.79	1.80	1.60	3.94	.96
6	variety of student experiences	4.54	.76	2.60	1.09	4.09	.54
7	teacher-student interaction	4.54	.69	2.81	1.15	4.29	.59
8	follow-through outside class	3.75	1.18	1.80	1.40	3.65	1.52
9	higher level thinking	2.22	1.41	2.41	1.20	4.19	.75
10	creativity	4.34	1.12	2.79	1.10	4.26	.51
11	teacher planning	4.61	.93	2.99	1.03	4.65	.61
12	use of learning aids	4.39	1.28	2.86	1.04	4.58	.56

Table 5.1 indicated that the means and standard deviations for the *trained* and *trainee* groups are similar.

The following Table 5.2 shows composite means, standard deviations and level of significance for *trained* and *untrained* teachers of gifted and talented students for a composite score on the *Teacher Observation Form (TOF)*

Table 5.2 Composite means, standard deviations and level of significance for *trained* and *untrained* teachers of gifted and talented students for a composite score on the *Teacher Observation Form (TOF)* n=136

Group	mean (x)	standard deviation (sd)	significance (p)
<i>Trained</i> n=56	4.32	.754	.000***
<i>Untrained</i> n=80	2.62	.809	

* $p < .025$ ** $p < .01$ *** $p < .001$

Table 5.2 reveals that teachers *trained* in gifted education scored significantly higher than the *untrained* teachers in gifted education on a composite score of the *Teacher Observation form (TOF)*.

The following Table 5.3 shows the composite means, standard deviations and level of significance for *trainee* and *untrained* teachers of gifted and talented students for a composite score on the *Teacher Observation Form (TOF)*.

Table 5.3 Composite means, standard deviations and level of significance for *trainee* and *untrained* teachers of gifted and talented students for a composite score on the *Teacher Observation Form (TOF)* n=111

Group	mean (x)	standard deviation (sd)	significance (p)
<i>Trainee</i> n=31	4.12	.428	.000***
<i>Untrained</i> n=80	2.62	.809	

* $p < .025$ ** $p < .01$ *** $p < .001$

Table 5.3 reveals that the *trainee* teachers scored significantly higher than the *untrained* teachers in gifted education on a composite score of the *Teacher Observation Form (TOF)*. If there is difference between the sample size of two groups the adjusted degrees of freedom is used for the t-test (Cohen & Manion,

1989). As this was the case for the *untrained* and *trainee*, an adjusted t value was inspected [$t_{(124)} = 12.59, p < .001$].

The following Table 5.4 indicates that there was no significant difference (at the $p < .025$ level of significance) between those *trained* in gifted education and those *undertaking training* on a composite score of the *Teacher Observation Form (TOF)* used to assess teaching skills. This is supported by the similar means and standard deviations produced in the results of these two groups.

Table 5.4 Composite means, standard deviations and level of significance for *trained* and *trainee* teachers of gifted and talented students for a composite score on the *Teacher Observation Form (TOF)* n=87

Group	mean (x)	standard deviation (sd)	significance (p)
<i>Trained</i> n=56	4.32	.754	.337
<i>Trainee</i> n=31	4.12	.428	

* $p < .025$ ** $p < .01$ *** $p < .001$

Table 5.4 reveals that there was no significant difference between the teachers *trained* in gifted education and those *undertaking training* in gifted education on a composite score of the *Teacher Observation Form (TOF)*.

The *Teacher Observation Form (TOF)* consists of 12 items that are a combination of rating scale items and checklist items. The 12 items on the *Teacher Observation Form (TOF)* focus on critical teaching skills appropriate to teaching gifted and talented students. The items are labelled as follows:

- Item 1 subject matter coverage (concept orientation, teacher expertise)
- Item 2 clarity of teaching (communication skills, sufficient examples)
- Item 3 motivational techniques (teacher energy and enthusiasm, variety)
- Item 4 pace of instruction (individual needs accommodated and appropriate)
- Item 5 opportunity for self-determination of activities by student (in class/at home)
- Item 6 a variety of student experiences offered (discussions, small group/whole group activities)
- Item 7 teacher-student interaction (activities that promote group learning/problem solving, independent study processes, respect for individuals' ideas)
- Item 8 opportunities for student follow through for homework (thorough instruction and assistance by teacher)
- Item 9 emphasis on higher level thinking (Bloom's taxonomy and critical thinking)
- Item 10 emphasis on creativity (creative thinking skills and open-ended questioning, encourage risk taking)
- Item 11 teacher planning (flexible and student-centered)
- Item 12 learning aids (appropriate, clear, grammatically correct, range of materials)

A principal components analysis was used to establish whether or not a relationship existed among the combined variables. Items with eigenvalues greater than 1.0 and alpha reliability coefficients greater than 0.33 for the *Teacher Observation Form (TOF)* are reported. Items identified as discriminating between teachers *trained*, or currently *undertaking training*, and those teachers *untrained* in gifted education by a principal components analysis of the *Teacher Observation Form (TOF)* were:

Item 2 - clarity of teaching;

Item 3 - motivational techniques;

Item 9 - emphasis on higher level thinking; and

Item 10 - emphasis on creativity.

Table 5.5 Items identified by principal components analysis, eigenvalues and Cronbach alpha reliability coefficients for *trained* and *trainee* teachers of gifted and talented students for a composite score on the *Teacher Observation Form (TOF)*

Item	Eigenvalue	Alpha	Other reported research Alpha
clarity of teaching	3.88	.77	.65
motivational techniques	3.60	.83	.65
emphasis on higher level thinking	3.35	.68	.71
emphasis on creativity	3.04	.48	.74

These results of Table 5.5 are consistent with the research literature presented in Chapter Three and the reported alpha reliability coefficients by Hansen (1988). Therefore, the findings support the identified teaching skills of effective teachers of gifted children.

The results of the MANOVA that compared the total score of the *Teacher Observation Form (TOF)* with each of the 12 individual items identified on the *Teacher Observation Form (TOF)*, showed that *trained* and *trainee* teachers teaching gifted students scored higher in all cases than the *untrained* teachers - training was significant at the $p < .05$ level [$F_{(12,97)}=11.50, p < .001$].

Table 5.6 shows item means, standard deviations and level of significance for *trained* and *untrained* teachers of gifted and talented students for individual items on the *Teacher Observation Form (TOF)*. The results reveal that there was a significant difference on all of the 12 items between those teachers *trained* and those *untrained* in gifted education.

Table 5.6 Item means, standard deviations and level of significance for *trained* and *untrained* teachers of gifted and talented students for individual items on the *Teacher Observation Form (TOF)* n=136

TOF Item		<i>Trained</i> n=56		<i>Untrained</i> n=80		Level of sig.
		Mean (x)	stan. dev. (sd)	Mean (x)	stan. dev. (sd)	(p)
1	subject matter coverage	4.48	.91	2.94	1.19	.000***
2	clarity of teaching	4.48	.66	2.96	1.08	.000***
3	motivational techniques	4.32	.92	2.75	1.19	.000***
4	pace of instruction	4.47	.71	2.70	1.08	.000***
5	student-determined activities	3.82	1.79	1.80	1.60	.000***
6	variety of student experiences	4.54	.76	2.60	1.09	.000***
7	teacher-student interaction	4.54	.69	2.81	1.15	.000***
8	follow-through outside class	3.75	1.18	1.80	1.40	.000***
9	higher level thinking	2.22	1.41	2.41	1.20	.000***
10	creativity	4.34	1.12	2.79	1.10	.000***
11	teacher planning	4.61	.93	2.99	1.03	.000***
12	use of learning aids	4.39	1.28	2.86	1.04	.000***

* $p < .025$ ** $p < .01$ *** $p < .001$

Table 5.6 reveals that the results were significant between the *trained* and the *untrained* group of teachers teaching gifted children on a comparison of teaching skills.

The following Table 5.7 shows that there was a significant difference on all of the 12 items between those teachers *undertaking training* and those *untrained* in gifted education.

Table 5.7 Item means, standard deviations and level of significance for *trainee* and *untrained* teachers of gifted and talented students for individual items on the *Teacher Observation Form (TOF)* n=111

TOF Item		<i>Untrained</i> n=80		<i>Trainee</i> n=31		Level of sig.
		Mean (x)	stan. dev. (sd)	Mean (x)	stan.dev. (sd)	(p)
1	subject matter coverage	2.94	1.19	4.16	.69	.000***
2	clarity of teaching	2.96	1.08	4.29	.64	.000***
3	motivational techniques	2.75	1.19	4.23	.62	.000***
4	pace of instruction	2.70	1.08	4.16	.74	.000***
5	student-determined activities	1.80	1.59	3.94	.96	.000***
6	variety of student experiences	2.60	1.09	4.09	.54	.000***
7	teacher-student interaction	2.81	1.15	4.29	.59	.000***
8	follow-through outside class	1.80	1.40	3.65	1.52	.000***
9	higher level thinking	2.41	1.20	4.19	.75	.000***
10	creativity	2.79	1.10	4.26	.51	.000***
11	teacher planning	2.99	1.03	4.65	.61	.000***
12	use of learning aids	2.86	1.04	4.58	.56	.000***

* $p < .025$

** $p < .01$

*** $p < .001$

The results shown in Table 5.7 reveal that significance at the $p < .025$ level was achieved between the *trained* and the *untrained* group of teachers teaching gifted children in terms of the effect of training on observable teaching skills.

The following results describe the comparison of the individual scores on the *Teacher Observation Form (TOF)* according to training and reveal that there were no significant differences between the *trained* and *trainee* group in teaching skills as measured by the *Teacher Observation Form (TOF)*. The following Table 5.8 shows that there was no significant difference ($p < .025$) on 11 of the 12 items between those teachers *trained* or *undertaking training* in gifted education. Only one item on the *Teacher Observation Form (TOF)* showed a significant difference between the two groups (*trained* and *trainee* teachers).

Table 5.8 Item means, standard deviations and level of significance for *trained* and *trainee* teachers of gifted and talented students for individual items on the *Teacher Observation Form (TOF)* **n=87**

TOF Item		<i>Trained</i> n=56		<i>Trainee</i> n=31		Level of sig.
		Mean (x)	stan. dev. (sd)	Mean (x)	stan. dev. (sd)	(p)
1	subject matter coverage	4.48	.91	4.16	.69	.069
2	clarity of teaching	4.48	.66	4.29	.69	.213
3	motivational techniques	4.32	.92	4.23	.62	.564
4	pace of instruction	4.46	.71	4.16	.74	.067
5	student-determined activities	3.82	1.80	3.94	.96	.700
6	variety of student experiences	4.54	.76	4.10	.54	.002**
7	teacher-student interaction	4.54	.69	4.29	.59	.084
8	follow-through after class	3.75	1.77	3.65	1.52	.772
9	higher level thinking	4.21	1.41	4.19	.75	.929
10	creativity	4.34	1.12	4.26	.51	.645
11	teacher planning	4.61	.93	4.65	.61	.819
12	use of learning aids	4.39	1.28	4.58	.56	.346

* $p < .025$ ** $p < .01$ *** $p < .001$

The results shown in Table 5.8 reveal that no significant difference appeared between the *trained* and the *trainee* group of teachers teaching gifted children in 11 of the 12 items. Although there was no significant difference on 11 of the 12 items between those teachers *trained* or *undertaking training*, Item 6 (variety of student experiences) did discriminate between the *trained* and *trainee* groups and this will be discussed in Chapter Six.

5.3 CLASS ACTIVITIES QUESTIONNAIRE (CAQ) RESULTS

TESTING HYPOTHESIS TWO

"Making teachers aware of students' attitudes toward school and the learning environment should foster better understanding of the reciprocal influences that shape relationships in the classroom" (Davison, 1996, p. 41).

The *Class Activities Questionnaire (CAQ)* was used to measure the climate and focus in the classroom. The scores of a total of five nominated gifted and talented students from each one of 57 different teachers' classes were added and averaged (n=285).

The sample size of the *Class Activities Questionnaire (CAQ)* consisted of the following students: 90 students came from 18 *trained* teachers' classrooms which was 32% of the sample; 175 students came from 35 *untrained* teachers' classrooms which was 61% of the sample; and 20 students came from four *trainee* teachers' classrooms which was 7% of the sample. Only 57 teachers (or 34%) of the total sample in the study were teaching Years 6-12 and had five gifted and talented students in their classrooms. This particular issue of non-standardised identification procedures for gifted and talented students in the different schools will be referred to in Chapter Six.

Section 5.3 reports the analyses carried out to test hypothesis two - that there was significant difference between the *trained*, *untrained* and *trainee* teachers of gifted and talented students on a composite score for the *Class Activities Questionnaire (CAQ)*.

Student's t-test showed that students rated teachers *currently training* in gifted education significantly higher to those *untrained* in gifted education on a composite score of the *Class Activities Questionnaire (CAQ)* at the $p < .025$ level. The *trained* teachers had a higher score on the *Class Activities Questionnaire (CAQ)* than the *untrained* teachers at the $p < .025$ level of significance. However, Student's t-test showed that there was no significant difference between the *trained* and *trainee* teachers of gifted and talented students on a composite score for the *Class Activities Questionnaire (CAQ)*. The following Table 5.9 shows the composite means, standard deviations and level of significance for *trained* and *untrained* teachers of gifted and talented students on a composite score for the *Class Activities Questionnaire (CAQ)*.

Table 5.9 Composite means, standard deviations and level of significance for *trained* and *untrained* teachers of gifted and talented students on a composite score for the *Class Activities Questionnaire (CAQ)* n=265

Group	mean (x)	stan. dev. (sd)	significance (p)
<i>Trained</i> n=90	1.34	.48	.025*
<i>Untrained</i> n=175	1.13	.35	

* $p < .025$ ** $p < .01$ *** $p < .001$

The results in Table 5.9 reveal that significance was achieved between the *trained* and the *untrained* group of teachers teaching gifted children when investigating a composite score of the *Class Activities Questionnaire (CAQ)*.

The following Table 5.10 shows the results of composite means, standard deviations and level of significance for *untrained* teachers of gifted and talented

students and those *undertaking training* on a composite score for the *Class Activities Questionnaire (CAQ)*.

Table 5.10 Composite means, standard deviations and level of significance for *untrained* and *trainee* teachers of gifted and talented on a composite score for the *Class Activities Questionnaire (CAQ)* n=195

Group	mean (x)	stan. dev. (sd)	significance (p)
<i>Trainee</i> n=20	1.48	.55	.000***
<i>Untrained</i> n=175	1.13	.35	

* $p < .025$ ** $p < .01$ *** $p < .001$

The results in Table 5.10 reveal that there was a significant difference at the $p < .025$ level between the *trainee* and the *untrained* group of teachers on at a composite score of the *Class Activities Questionnaire (CAQ)*. As the sample size of the *trainee* and *untrained* group was disparate, an adjusted degrees of freedom was used in determining the t-test [$t_{(82)} = 3.81, p < .001$].

The following Table 5.11 shows composite means, standard deviations and level of significance for *trained* and *trainee* teachers of gifted and talented students on a composite score for the *Class Activities Questionnaire (CAQ)*.

Table 5.11 Composite means, standard deviations and level of significance for *trained* and *trainee* teachers of gifted and talented students on a composite score for the *Class Activities Questionnaire (CAQ)* n=110

Group	mean (x)	stan.dev. (sd)	significance (p)
<i>Trained</i> n=90	1.47	.55	.135
<i>Trainee</i> n=20	1.34	.48	

The results in Table 5.11 reveal that no significance ($p > .05$) was found between the *trained* and the *trainee* group of teachers teaching gifted children when inspecting a composite score of the *Class Activities Questionnaire (CAQ)*. This result will be explored further and discussed in Chapter Six.

The *Class Activities Questionnaire (CAQ)* consists of 27 items that are rating scale items. The 27 items focus on teaching which indicate a positive or negative classroom climate. Thirteen of the items indicate teaching behaviours that are appropriate in teaching gifted and talented students and provide a measure of positive classroom climate (Steele, 1981). The 27 items are categorised into 16 factors and the 16 factors are further categorised into four dimensions - see Table 4.1. The 16 factors of the *Class Activities Questionnaire (CAQ)* are: memory, translation, interpretation, application, analysis, synthesis, evaluation, discussion, test/grade stress, lecture, enthusiasm, independence, divergence, humour, teacher talk and homework preparation time.

Items with eigenvalues greater than 1.0 and corresponding alpha reliability coefficients greater than 0.33 for the *Class Activities Questionnaire (CAQ)* are reported. Items identified as discriminating between teachers *trained*, or currently *undertaking training* and those teachers *untrained* in gifted education by a principal components analysis of the *Class Activities Questionnaire (CAQ)*. Table 5.12 shows that there were nine factors identified by the principal components analysis and they were: enthusiasm, evaluation, application, lecture, discussion, interpretation, analysis, test/grade stress and independence.

Table 5.12 Items identified by principal components analysis, eigenvalues and Cronbach alpha reliability coefficients for *trained* teachers of gifted and talented students for a composite score on the *Class Activities Questionnaire (CAQ)*

No.	Factor	Eigenvalue	Alpha
1	Enthusiasm	3.87	.92
2	Evaluation	3.01	.81
3	Application	2.09	.68
4	Lecture	1.53	.84
5	Discussion	1.50	.69
6	Interpretation	1.34	.51
7	Analysis	1.27	.74
8	Test/grade stress	1.14	.43
9	Independence	1.11	.77

The results of Table 5.12 are consistent with the research literature presented in Chapter Three and support the identified classroom climate and focus of effective teachers of gifted and talented students. In a principal components analysis, factors were extracted using scree test and eigenvalue specifications greater than 1.0 and, in most cases, were rotated using varimax rotation to report factor loadings with an absolute value greater than 0.33 for the *Class Activities Questionnaire (CAQ)*.

Table 5.13 Principal components analysis (varimax rotation) for the identified items (with factor loadings) for the *Class Activities Questionnaire (CAQ)*

Item	Factor Loadings									Factor name
	1	2	3	4	5	6	7	8	9	
enthusiasm	.688									Classroom climate
feelings	.674									
divergence	.665									
discussion	.665									
ideas	.572									
discussion2	.555									
independence	.511									
application2	.443									Higher level thinking
synthesis2	.401									
translation2		.627								
memory		.504								
test stress		.484								
evaluation		.421								Higher level thinking
test stress2		.417								
lecture			.672							
teacher talk			.672							Classroom focus
evaluation			.484							
analysis				-.497						Classroom focus
application				.478						
interpret.2					.565					Classroom focus
synthesis					.489					
interpret.2					.479					
translation						.657				Lower level thinking
analysis2							.546			Higher level thinking
lecture							.473			
humour								.557		Classroom focus
memory									.481	Classroom climate

factor 1 = Enthusiasm, factor 2 = Evaluation, factor 3 = Application,

factor 4 = Lecture, factor 5 = Discussion, factor 6 = Interpretation,

factor 7 = Analysis, factor 8 = Test/grade stress, factor 9 = Independence

The results reported in Table 5.13 are consistent with the research literature presented in Chapter Three and support the four identified dimensions of classroom climate apparent in effective teachers of gifted and talented students – see *Appendix D*.

Student's t-test was carried out on each item on the *Class Activities Questionnaire* (CAQ) and the following Table 5.14 shows that those teachers belonging to the *trainee* group were rated higher by their students than were the teachers from the *untrained* group.

Table 5.14 Item means and standard deviations for *trainee* and *untrained* teachers for the *Class Activities Questionnaire (CAQ)* n=195

CAQ Item	Trainee n=20		Untrained n=175		level of sig.
	Mean (x)	stan. dev. (sd)	Mean (x)	stan. dev. (sd)	(p)
1. memory item 1	1.01	1.18	.03	.81	.001**
2. evaluation item 1	.89	1.03	.23	.61	.000***
3. application item 1	.78	.92	.23	.62	.000***
4. no lecturing item 1	1.03	1.22	.26	.70	.000***
5. discussion item 1	.94	2.32	.22	.68	.018*
6. interpretation item 1	.87	1.04	.23	.62	.000***
7. analysis item 1	.84	.98	.24	.65	.000***
8. test stress item 1	1.13	1.33	.30	.81	.000***
9. translation item 1	.76	.92	.20	.54	.000***
10. memory item 2	1.13	1.33	.34	.91	.001**
11. synthesis item 1	.75	.88	.25	.66	.002**
12. analysis item 2	.92	1.10	.27	.73	.000***
13. independence	.87	1.03	.21	.59	.000***
14. discussion item 2	.63	.75	.21	.57	.002**
15. interpretation item 2	.92	1.07	.28	.74	.001**
16. divergence	.70	.83	.19	.51	.000***
17. feelings valued	.81	.97	.22	.60	.000***
18. enthusiasm	.85	1.0	.26	.71	.001**
19. evaluation item 2	.97	1.14	.28	.77	.000***
20. translation item 2	.90	1.04	.27	.72	.001**
21 test stress item 2	1.17	1.40	.36	.94	.001**
22. synthesis item 2	1.01	1.25	.31	.85	.001**
23. ideas valued	.86	1.03	.26	.70	.001**
24. humour	.68	.83	.23	.63	.003**
25 teacher talk	1.24	1.52	.30	.77	.000***
26. no lecturing item 2	1.26	1.53	.30	.77	.000***
27. homework prep (in hours)	.78	.97	.23	.62	.001**

* $p < .025$ ** $p < .01$ *** $p < .001$

The results in Table 5.14 reveal that significance was achieved between the *trainee* and the *untrained* group of teachers teaching gifted children when investigating each individual item score of the *Class Activities Questionnaire* (CAQ).

MANOVA and T-tests were used to compare scores of the *Class Activities Questionnaire* (CAQ) on the four dimensions: lower thought processes, higher thought processes, classroom focus (how teachers and students interact) and classroom climate (student attitudes and feelings). Table 5.15 shows a comparison of *trained* and *untrained* teachers on the four dimensions of the *Class Activities Questionnaire* (CAQ).

Table 5.15 Comparison of *trained* and *untrained* teachers on the four dimensions of the *Class Activities Questionnaire* (CAQ) n=285

CAQ DIMENSION	<i>Trained</i> n=90		<i>Untrained</i> n=175		Level of sig. (p)
	Mean (x)	stan.dev. (sd)	Mean (x)	stan.dev. (sd)	
Lower-level thought processes	3.34	1.86	2.62	1.32	.099
Higher-level thought processes	4.48	.66	2.96	1.08	.000***
Classroom Focus	4.32	.92	2.75	1.19	.000***
Classroom Climate	3.81	1.8	2.87	1.18	.027*

* $p < .025$ ** $p < .01$ *** $p < .001$

The results in Table 5.15 reveal that a $p < .025$ level of significance was attained on three of the four dimensions between the *trained* and the *untrained* group of teachers teaching gifted children when investigating the four dimensions of the *Class Activities Questionnaire* (CAQ).

Table 5.16 shows a comparison of *trainee* and *untrained* teachers on the four dimensions of the *Class Activities Questionnaire (CAQ)*.

Table 5.16 Comparison of *trainee* and *untrained* teachers on the four dimensions of the *Class Activities Questionnaire (CAQ)* n=195

CAQ DIMENSION	<i>Trainee</i> n=20		<i>Untrained</i> n=175		Level of sig.
	Mean (x)	stan. dev. (sd)	Mean (x)	stan. dev. (sd)	(p)
Lower-level thought processes	3.88	1.4	2.88	1.2	.014*
Higher-level thought processes	4.18	.91	3.0	1.2	.000***
Classroom Focus	4.32	.92	2.75	1.19	.000***
Classroom Climate	2.7	1.3	1.7	1.6	.065

* $p < .025$ ** $p < .01$ *** $p < .001$

Again, the results in Table 5.16 reveal that significance was achieved on three of the four dimensions between the *trainee* and the *untrained* group of teachers teaching gifted children when investigating the four dimensions of the *Class Activities Questionnaire (CAQ)*.

There was no significant difference found between the *trained* and *trainee* groups on the four dimensions of the *Class Activities Questionnaire (CAQ)*.

Further analyses were carried out using a cross tabulation (CROSSTABS) table to explore the extent of the differences on the four dimensions of the *Class Activities Questionnaire (CAQ)* as defined by Steele (1981). It was shown that there were

significant differences between *trained* and *untrained* teachers on two of the four dimensions: higher level thought processes, [$F_{(2,164)}=5.32, p < .05$] and classroom focus [$F_{(2,164)}=5.19, p < .05$].

Significant difference was also found between *trainee* and *untrained* teachers on the same two of the four dimensions: higher level thought processes [$F_{(1,109)}=9.38, p < .005$] and classroom focus [$F_{(1,109)}=9.39, p < .005$].

Specifically, the results reported that the *trained* teachers lectured less than the *untrained* did [$F_{(2,164)}=5.63, p < .005$]; that the *trained* teachers conducted more discussions than the *untrained* teachers did [$F_{(2,164)}=5.62, p < .005$]; and that the *trained* placed more emphasis on feelings than the *untrained* teachers did [$F_{(2,164)}=5.35, p < .05$]. These results are consistent with Hansen's (1988) study in her comparisons of *trained* and *untrained* teachers.

The statistical analysis reported that the *trainee* teachers lectured less than *untrained* [$F_{(1,109)}=9.95, p < .005$] and that the *trainee* teachers placed more emphasis on feelings than the *untrained* teachers did [$F_{(1,109)}=8.95, p < .005$]. All of these results support that the *trained* and *trainee* teachers had a more positive classroom climate than the *untrained* teachers. The results of this study are consistent with the literature reviewed in Chapter Three.

The following Table 5.17 shows a comparison of means for the *trained*, *untrained* and *trainee* groups of teachers across the four dimensions of the *Class Activities Questionnaire (CAQ)*.

Table 5.17 Comparison of means for the *trained*, *untrained* and *trainee* groups of teachers across the four dimensions of the *Class Activities Questionnaire (CAQ)*. n=285

Group _____	<i>Trained</i> compared to <i>Untrained</i>	<i>Trainee</i> compared to <i>Untrained</i>	<i>Trained</i> compared to <i>Trainee</i>
CAQ Dimensions	<i>t</i> value (<i>df</i>) Significance (<i>p</i>)	<i>t</i> value (<i>df</i>) Significance (<i>p</i>)	Sig. (<i>p</i>)
Lower-level thought processes	$F_{(2,164)}=4.63$ ($p < .006^{**}$)	$F_{(1,109)}=9.95$ ($p < .002^{**}$)	<i>n.s.</i>
Higher-level thought processes	$F_{(2,164)}=5.32$ ($p < .006^{**}$)	$F_{(1,109)}=9.38$ ($p < .003^{**}$)	<i>n.s.</i>
Classroom focus	$F_{(2,164)}=5.19$ ($p < .007^{**}$)	$F_{(1,109)}=9.39$ ($p < .003^{**}$)	<i>n.s.</i>
Classroom climate	$F_{(2,164)}=4.65$ ($p < .011^*$)	$F_{(1,109)}=8.95$ ($p < .003^{**}$)	<i>n.s.</i>

* $p < .05$ ** $p < .01$ *** $p < .001$

Table 5.17 reveals that both the *trained* and *trainee* teachers scored significantly higher on the *Class Activities Questionnaire (CAQ)* than the *untrained* group of teachers.

A combined score of the *Teacher Observation Form (TOF)* and the *Class Activities Questionnaire (CAQ)* showed a significant difference between the three groups based on training with those *trained* or *undertaking training* [$F_{(12,122)}=15.27$, $p < .001$] scoring significantly higher.

5.4 PARTICIPANT INFORMATION FORM (PIF) CORRELATED WITH TEACHING SKILLS: RESULTS TESTING HYPOTHESIS THREE

"Many consider the psychological make-up of a teacher to be the most powerful force in effective teaching" (Hansen & Feldhusen, 1994, p. 115).

This section explores the analyses carried out to test the third hypothesis - that there are psychological, demographic or experiential variables (as indicated by the participants in the study on the *Participant Information Form*) which correlate significantly with teaching skills as measured by the *Teacher Observation Form (TOF)*.

Correlations were carried out to determine whether or not there were significant relationships (at the $p < .05$ level of significance) between single variables on the *Participant Information Form (PIF)*: gender; training in gifted education; year level taught for the observation; type of program currently teaching; years of regular teaching experience; years of teaching experience with gifted and talented students; a desire to pursue training in gifted education; undergraduate average grade; currently teaching in their specific subject area (for example, Maths or English in which the teacher was trained); support for educational programming for gifted and talented students and satisfaction with current position as a teacher and total scores on the *Teacher Observation Form (TOF)*.

The results revealed that there was a significant positive association between the total scores on the *Teacher Observation Form (TOF)* and *training* in gifted education, $r = .55$, $n=167$, $p < .05$. This finding is supported by the testing of

hypothesis one, which was accepted, as there were significant differences in observable teaching skills between *trained*, *trainee* and *untrained* teachers of gifted and talented students.

The data analysis also showed that a significant positive association was found between the total scores on the *Teacher Observation Form (TOF)* and the type of program taught, $r = .53$, $n=167$, $p < .005$. The teachers' ($n=167$) mean scores by type of program taught ranged from $x=3.00$ to $x=3.88$ with the most significant associations appearing between total scores on the *Teacher Observation Form* and self-contained gifted classes $\chi^2 = 3.68$, ($n=53$), $p < .05$.

A significant positive association was also found between the total scores of the *Teacher Observation Form (TOF)* and the teachers' support for gifted education programs, $r = .31$, $n=167$, $p < .001$. This psychological finding is discussed in Chapter Six.

A significant association was also found between the total scores of the *Teacher Observation Form (TOF)* and the teachers' undergraduate average grade, $r = .28$, $n=167$, $p < .001$. A significant association was found between the total scores of the *Teacher Observation Form (TOF)* and the type of school, $r = -.25$, $n=167$, $p < .01$ and years of teaching gifted and talented students, $r = -.20$, $n=167$, $p < .05$. These demographic findings are discussed in Chapter Six.

The following Table 5.18 shows that the examination of the Pearson Product correlation coefficients revealed that the direction of the measures was as

expected for the *Participant Information Form (PIF)* background variables and total scores on the *Teacher Observation Form (TOF)* and that they were significantly associated.

Table 5.18 Pearson Product correlation coefficients for the *Participant Information Form (PIF)* background variables and total scores on the *Teacher Observation Form (TOF)*. n=167

Item on Participant Information Form (PIF)	correlation coefficient (r)	significance (p)
training in gifted education	.55	.014*
type of program taught	.52	.004**
support for gifted education programs	.31	.000***
Undergraduate average grade	.28	.000***
primary or secondary school	-.25	.001**
satisfied with teaching position	-.20	.013*
number of years of teaching gifted students	.16	.046*

* $p < .05$ ** $p < .01$ *** $p < .001$

Table 5.18 reveals that there were significant correlations between total scores on the *Teacher Observation Form (TOF)* and seven of the eleven background variables identified on the *Participant Information Form (PIF)*

The Pearson Product correlations show that there were no significant correlations between teaching skill as measured by the *Teacher Observation Form (TOF)* and either gender, years of regular teaching experience, a desire to pursue training in gifted education or whether they were currently teaching in their specific subject area.

5.5 PARTICIPANT INFORMATION FORM (PIF) CORRELATED WITH CLASSROOM CLIMATE: RESULTS TESTING HYPOTHESIS FOUR

"The good teacher becomes one who supports in his students a more sustained grouping, exploration and synthesis" (Perry, 1968, as cited in Steele, 1995, p. 44).

This section explores the data analysis procedures used to test the fourth hypothesis - that there are psychological, demographic or experiential variables (as indicated by the participants in the study on the *Participant Information Form*) which correlate significantly with classroom climate as measured by the *Class Activities Questionnaire (CAQ)*.

Correlation analyses were carried out to determine whether or not there were significant relationships (at the $p < .05$ level of significance) between single variables on the *Participant Information Form (PIF)* and total scores on the *Class Activities Questionnaire (CAQ)*. Pearson Product moment correlations were calculated to determine the relationship (if any) between gender; training in gifted education; year level taught for the observation; type of program currently teaching; years of regular teaching experience; years of teaching experience with gifted and talented students; a desire to pursue training in gifted education; undergraduate average grade; currently teaching in their specific subject area; support for educational programming for gifted and talented students and satisfaction with current position as a teacher and a total score of the *Class Activities Questionnaire (CAQ)*.

A significant positive association was found between classroom climate and the type of program taught, $r = .52$, $n=285$, $p < .001$ and between classroom climate and the type of school (that is, whether a primary or a secondary school), $r = .57$, $n=285$, $p < .005$.

A significant positive association was found between classroom climate and support for gifted education programs, $r = .31$, $n=285$, $p < .001$; and between classroom climate and training in gifted education, $r = .31$, $n=285$, $p < .05$. These specific findings are discussed in Chapter Six.

Significant associations were also found between classroom climate and number of years of regular teaching experience $r = -.21$, $n=285$, $p < .05$; and between classroom climate and satisfaction with current teaching position gifted education, $r = -.21$, $n=285$, $p < .01$.

The following Table 5.19 shows that the examination of the Pearson Product correlation coefficients revealed that the direction of the measures was as expected for the *Participant Information Form (PIF)* background variables and total scores on the *Class Activities Questionnaire (CAQ)* and that they were significantly associated.

Table 5.19 Pearson Product correlation coefficients for *Participant Information Form (PIF)* background variables and classroom climate as measured by the *Class Activities Questionnaire (CAQ)*. n=285

Item on Participant Information Form (PIF)	correlation coefficient (r)	significance (p)
primary or secondary school	.57	.000***
type of program taught	.52	.004**
support for gifted education programs	.31	.000***
training in gifted education	.31	.01*
number of years of regular teaching	-.21	.01*
satisfied with teaching position	-.21	.007**

* $p < .05$ ** $p < .01$ *** $p < .001$

Table 5.19 reveals that the significant correlations were achieved between total scores on the *Class Activities Questionnaire (CAQ)* and six of the eleven background variables identified on the *Participant Information Form (PIF)*.

The Pearson Product correlations show that there were no significant associations between classroom climate and either gender, number of years teaching gifted and talented students, undergraduate average grade, a desire to pursue training in gifted education or currently teaching in their specific subject area.

Summary

The results of the multivariate statistical analysis presented in the first part of this Chapter largely supports the working hypotheses. The correlational analyses revealed that both strength and direction of the significance were as expected. The following section 5.6 reports on the investigations carried out on the qualitative data collected from the *Class Activities Questionnaire (CAQ)* measuring classroom climate.

5.6 QUALITATIVE DATA: STUDENTS' PERCEPTIONS OF THE CLASSROOM CLIMATE

"Even though teachers recognise the importance of developing favourable attitudes toward school, they often view attempts to measure students' perceptions concerning the classroom environment as harmless manifestations of professorial proclivities" (Goddall & Brown, 1983, p. 2).

Qualitative data can make a significant contribution to the quantitative data presented in these results because "...the best research often combines features of both qualitative and quantitative data...as it contributes to the total picture" (Lancy, 1993). The qualitative data collected for this study were small in comparison to the quantitative data. The students who completed the *Class Activities Questionnaire* (n=285) were given the opportunity to comment on the following two aspects of their class:

- 1) List the best things about this class from your point of view.
- 2) If you could change three things about the class, what would they be?

The students were also given the opportunity to contribute an additional open-response comment simply labelled 'comments'.

Almost all students (n=275 or 97%) took the opportunity to complete the open-response section of the *Class Activities Questionnaire* (CAQ). Comments have been classified and grouped according to affective or cognitive factors as these were the categories identified by Steele (1981) in the *Class Activities Questionnaire* - see *Appendix D*. This system of reducing the number of issues found in the open-response comments to a manageable and meaningful number of

categories is a practice consistent with qualitative research methods (de Vaus, 1995).

The protocol of the instrument (Steele, 1981) dictates that each of the 27 survey items is assigned to one of the four dimensions of *Class Activities Questionnaire* (CAQ) - lower thought processes, higher thought processes, classroom focus (how teachers and students interact) and classroom climate (student attitudes and feelings). The qualitative data have initially been categorised to match a similar item in the *Class Activities Questionnaire* (CAQ). The item was then assigned to one of the four dimensions. Many of the students' responses were grouped together on an item because the responses reflected a similar view.

The qualitative data collected from the *Class Activities Questionnaire* (CAQ) have been grouped according to the *training* category of the teacher responsible for the class (*trained*, *untrained* or *trainee*) and these have been tabulated in Tables 5.20 and 5.21. These two tables (5.20 and 5.21) reflect the number of responses as a percentage after totaling the number of student responses for each item.

In summary, the students' comments and the following Tables 5.20 and 5.21 provide a comprehensive account of the type of classroom climate according to the affective and cognitive categories. Table 5.20 summarises the open response comments (qualitative data) collected from the *Class Activities Questionnaire* (n=275) about the best things in the class which were classified according to the teachers' training status.

Table 5.20: Open response comments (qualitative data) collected from the *Class Activities Questionnaire (CAQ)* open response item "List the three best things about this class" categorised according to cognitive or affective dimensions and classified according to training (n=275).

	<i>Trained</i> (n=90)	<i>Untrained</i> (n=165)	<i>Trainee</i> (n=20)
Affective (positive Classroom climate)	48.7%	35%	49.5%
Cognitive (Higher thought process)	41%	26%	38.5%
Cognitive (Lower thought process)	6.3%	29%	6.5%
Cognitive (Classroom focus)	4%	10%	5%

Table 5.20 reflects the number of responses as a percentage after totaling the number of student responses for each item. The students' comments that follow exemplify and support the quantitative data in revealing the *trained* and *trainee* teachers' classroom climate as significantly different to that of the *untrained* teachers. The most commonly described "best thing about this class" was the teacher and how she or he contributed to the classroom climate through an emphasis on higher level cognitive aspects such as initiative, acceptance and freedom of ideas for the students. The following comments from students show how the *trained* teacher contributed significantly to the affective and cognitive classroom climate, level of thinking and classroom focus. The researcher has not been selective about the comments and has shown a true cross-section of comments, representative of the sample. The quantity of negative and positive comments is also represented.

Classroom climate (affective) - *trained* group

"I like this class because everyone is enthusiastic, capable and there is freedom to speak your mind about an issue. Our teacher really encourages and challenges us well and I have learnt more this semester than in the past two years" (Student #61).

"I love this class! I don't want Miss B to leave as I just know it will all go back to how it was before when Science was not graded" (Student #138).

Higher thought process (Cognitive) – *trained* group

"In this class our teacher really encourages us to think about why something in Science happens" (Student #137).

Lower thought process (cognitive)- *trained* group

"It is great how the teacher is able to make the questions easier for the other kids and harder (like thinking about stuff) for us" (Student #25).

Classroom focus (cognitive)- *trained* group

"What this teacher does is make us listen to what she says because she seems to know so much about everything and everyone pays her the attention she asks for" (Student #36).

The following comments are from students who spoke of how the *trainee* teacher contributed significantly to the classroom climate (affective), cognitive classroom climate, level of thinking and classroom focus.

Classroom climate (affective) - trainee group

"We have interesting discussions that are always well thought out by the teacher" (Student #274).

"The understanding of the scientific world" (Student #275).

"...relaxed, accepting, great educational opportunities" (Student #1).

Higher thought process (Cognitive) – trainee group

"Making us think about how to use all the information we are given – putting the work to use in other Mathematical problems is really useful for exams" (Student #231).

Lower thought process (cognitive)- trainee group

"The teacher just knows how to get the work right for all students in the class" (Student #3).

Classroom focus (cognitive)- trainee group

"The discussions are really focused on the topic and our teacher makes sure we are all relaxed and understand what she expects us to do" (Student #231).

"Mr. X created a great classroom environment and such endeavours create extra comfort and our classroom's relaxed atmosphere is very conducive to learning" (Student #3).

Table 5.21 summarises the open response comments (qualitative data) collected from the *Class Activities Questionnaire* (n=275) about what three things you would change about the class classified according to the teachers' training status.

Table 5.21: Open response comments (qualitative data) collected from the *Class Activities Questionnaire (CAQ)* item "What three things would you change about the class?" categorised according to cognitive or affective dimensions and classified according to training (n=275).

	<i>Trained</i> (n=90)	<i>Untrained</i> (n=165)	<i>Trainee</i> (n=20)
Affective (positive Classroom climate)	3%	13.3%	12.5%
Cognitive (Higher thought process)	11%	32.7%	4%
Cognitive (Lower thought process)	7%	41%	9%
Cognitive (Classroom focus)	1%	13%	3%

Table 5.21 reflects the number of responses as a percentage after totaling the number of student responses for each item. **None** of the students in the *trained* and *trainee* teachers' classrooms (n=110) wanted to change anything about the teacher, their method of instruction or the instructional climate. The things that they did want to change (for example, the actual size or location of the classroom) could not be categorised as affective or cognitive. The students, however, in the *untrained* teachers classrooms had strong feelings about the teaching skills used in the classroom, the teacher and the teachers' ability to facilitate learning for the gifted students. As a result, the students suggested changes for the class with many comments related to the level of subject matter offered by the teacher. **None** of the students (n=165) in the *untrained* teachers classrooms offered positive responses to these open-response questions on **the *Class Activities Questionnaire (CAQ)***.

The following comments reflect the students' perception of the instructional climate and include suggestions for changes in the *untrained* teachers' classrooms.

Changes to the classroom climate - *untrained* group

"Less dictionary meanings - all day!" (Student #239).

"To be able to choose what we read - the books are too easy" (Student #92).

"Make the topics more interesting. We always do the facts and nothing else in History" (Student #129).

"We could move on to harder work" (Student #18).

"The amount of time given to finish an activity is too much" (Student #30).

"Vary the teaching methods" (Student #188).

"More practical work so understanding is easier" (Student #106).

The qualitative data were analysed according to the four dimensions of the *Class Activities Questionnaire (CAQ)*. The responses are illuminating as they exemplified the concerns that were important to the individual students and confirmed the broad trends already identified from the quantitative results of the *Class Activities Questionnaire (CAQ)*.

As the *Class Activities Questionnaire (CAQ)* is useful in identifying teaching behaviours that are appropriate in teaching gifted and talented students (Steele, 1981), these indicators have been used to interpret the qualitative data. The indicators identified by Steele (1981) as teaching skills for facilitating the learning of gifted students are:

- student involvement and enthusiasm (items 19 and 25)
- intellectual atmosphere (Item 23)
- higher thought processes (Items 3 and 13, 7 and 12, 11 and 23, 2 and 20)
- independence (Item 14)
- divergence (Item 17)

An analysis of the data revealed that there were common patterns of interactions between and among the two items identifying a particular factor that required two items (student involvement and enthusiasm [items 19 and 25] and higher thought processes [Items 3 and 13, 7 and 12, 11 and 23, 2 and 20]). The students' responses presented in this section provide clear evidence of a strong relationship between positive classroom climate and the identified indicators of effective teaching skills with gifted and talented students. The following comments come from students in the *trained* and *trainee* teachers' classrooms and support the teaching skills that are appropriate in teaching gifted and talented students as found by Steele (1981).

Student involvement and enthusiasm - *trained* and *trainee* group

"EVERYONE'S opinion is respected and everyone is given a chance to give their opinion" (Student #172).

"It's fun being in this class" (Student #259).

"Use of group work and class discussion spread all our ideas around - it's great!" (Student #82).

Intellectual atmosphere - *trained* and *trainee* group

"I love this class! I was very angry (as were my classmates) when I discovered that next year English is not graded" (Student #2).

"The students in this class are of the same academic standard" (Student #199).

"Being challenged" (Student #37).

"Having students who are capable and willing to do the work presented to them" (Student #63).

"We have very interesting discussion with strong, well thought out points of view" (Student #2).

"Gathering of many students of equal level" (Student #67).

Higher thought processes - *trained* and *trainee* group

"Mr. J has created a mentally stimulating environment which makes us think about everything we learn" (Student #116).

"I like applying what I learn to questions rather than to learning the facts only" (Student #274).

Independence - *trained* and *trainee* group

"I am asked to participate and answer questions and at other times I can work on my own projects" (Student #101).

"The experiments show us what we have learnt in practice" (Student #98).

"Discussion, innovation, originality" (Student #7).

Divergence - *trained* and *trainee* group

"A wide range of discussion topics are offered and lots of different answers are accepted" (Student #11).

"I understand things that once seemed difficult and I am able to discover new things all the time" (Student #143).

"It is slightly different to other classes because you are able to say what you really mean" (Student #142).

"I feel the most challenged in this class, of all subjects. There is such a large opportunity for abstract thinking in class work" (Student #14).

A very different classroom situation was revealed by the students' responses in the classrooms of the *untrained* teacher. The comments that follow come from students in the *untrained* teachers' classrooms.

Student involvement and enthusiasm - *untrained* group

"I learn everything at home and just do the sheets at school" (Student #35).

"It feels like a bludge. It doesn't feel like we're learning at times" (Student #78).

"Concentrate on the activity and not what happened at lunch time" (Student #26).

Intellectual atmosphere - *untrained* group

"Reading sheets in class does not help us learn" (Student #159).

"Less exam practice all the time" (Student #160).

"Less social talk and more work by both the students and the teacher" (Student #224).

Higher thought processes - *untrained* group

A lack of difficulty in the work presented is exemplified by the following two comments:

"I hate doing work from the textbook ... because it is overly repetitive and boring" (Student #111).

"I prefer applying what I learn, not just learning the facts only" (Student #75).

"Apply what we learn by answering more questions, making comparisons" (Student #56).

Independence - *untrained* group

"Stop the continual mathematical introductions - we can read it ourselves" (Student #155).

"Working more efficiently by choosing our own groups or even working by ourselves for a change" (Student #283).

Divergence - *untrained* group

"Do not get off the task" (Student #80).

"Less work from the syllabus" (Student #34).

"Get more involved in the experiment - so much more could be learned if we waited a while" (Student #225).

On becoming satisfied with the classroom climate and the teacher's treatment of the students in the *trained* teachers' classrooms, the following students spoke of how the teacher contributes positively to the classroom climate.

Teacher's contribution to the classroom climate - *trained* group

"My mind is allowed to open up to new ideas with Miss Z" (Student #96).

"...a decent teacher - not so boring and ordered" (Student #8).

"This class travels along really well and if it keeps up this way, I don't ever want to leave" (Student #63).

It is worth noting that several of the students responded that the choice of class discussion groups made a difference to the enjoyment of the class in the *trainee* teachers' classrooms.

Choice of discussion groups - *trainee* group

"in depth discussions in History are always challenging and I think about them afterwards all the time" (Student #38).

"...the work we do in this class is not boring, it is fun as everyone gets to share their opinions" (Student #7).

The statements that follow are gathered from the open response "Comments" section and reflect a strong relationship between training in gifted education and a positive classroom environment. All responses come from either the *trained* or *trainee* teachers' classrooms.

Comments about the classroom climate - *trained* and *trainee* group

"I really appreciate the smaller class atmosphere. It allows for one to feel more involved and it also encourages one to work to achieve one's potential" (Student #146).

"Excellent class compared to the other class and a welcome challenge"
(Student #2).

"People really listen to what you have to say" (Student #141).

"Doing work at our own level is the best thing" (Student #214).

"There is a lot of encouragement about doing your best" (Student #5).

"The emphasis to perform well in this class is good for me" (Student #1).

Some of the students in the *untrained* teachers classrooms felt that their needs were not being met and the realities of the class often diverged from their expectations. As a result these students lacked a positive classroom climate, which is reflected in the following statements:

Needs not being met - *untrained* group

"We just take too many notes in this class and we are always on the same task for a long period of time" (Student #156).

"I would like to just come into the classroom and get straight into the work and not sit around waiting for everyone else" (Student #22).

Such statements can obviously be related to the individual negative or positive attributes of the teacher and in this case, how it relates specifically to the affective classroom climate. The single-status variable "teacher talk" (item 26 on the *Class Activities Questionnaire*) was assigned to many comments by the students in the *untrained* teachers' group. The following comments reflect a frustration with the teachers' ability to encourage a positive classroom climate in the *untrained* teachers' class.

Teacher talk - *untrained* group

"I think that school can be fun but not always in classtime" (Student #185).

"I wish we could get some help with the research we want to do" (Student #21).

"The enjoyment of the class depends on how it is taught" (Student #150).

Summary

Selective coding techniques (Lancy, 1993) were used to analyse the comments made by students completing the *Class Activities Questionnaire (CAQ)* open-response section of the survey instrument. The qualitative analysis parallels the trends revealed in the quantitative analysis and supports the findings of the quantitative data where it was revealed that training in gifted education makes a significant difference to the classroom climate. Further evidence for the training of teachers in gifted education is provided by the results of the qualitative analysis and highlights the theoretical framework proposed in this study.

5.7 SUMMARY OF RESULTS TESTING THE HYPOTHESES

"At the beginning of the teacher's professional development we should let the teacher concentrate on mastering the basic skills, and the interaction process between the students and teachers" (Tirri, 1993, p. 38).

This Chapter presented the results of the statistical methods outlined in Chapter Four. The first part of this Chapter presented the results of the multivariate analysis that provided evidence in support of the effect of teacher training in gifted education. There were significant differences between teachers *trained* or currently *undertaking training* in gifted education and teachers *untrained* in gifted

education for the total scores on the *Teacher Observation Form (TOF)*. Those teachers who were *trained* or *currently in training* in gifted education scored significantly higher than those teachers *untrained* in gifted education for the total scores on the *Teacher Observation Form (TOF)*. The effect of the specialised teacher training was, therefore, significant in measuring the teaching skills as indicated by the *Teacher Observation Form (TOF)*.

Thus, hypothesis one was confirmed as there were significant differences between teachers *trained* or *currently in training* in gifted education and teachers *untrained* in gifted education for the total scores on the *Teacher Observation Form (TOF)*.

The next part of this Chapter presented the results of the multivariate analysis of the survey instrument the *Class Activities Questionnaire (CAQ)* which also provided evidence in support of the effect of specialised teacher training in gifted education. There were significant differences between teachers *trained* or *currently in training* in gifted education and teachers *untrained* in gifted education for the total scores on the *Class Activities Questionnaire (CAQ)*. Those teachers *trained* or *currently in training* in gifted education scored significantly higher than those teachers *untrained* in gifted education for the total scores on the *Class Activities Questionnaire (CAQ)*. The effect of specialised teacher training was significant in measuring the classroom climate as indicated by the *Class Activities Questionnaire (CAQ)*.

Therefore, hypothesis two was confirmed as significant differences were found between teachers *trained* or *currently in training* in gifted education, and teachers

untrained in gifted education for the total scores on the *Class Activities Questionnaire (CAQ)*.

The third part of the Chapter revealed the results of the correlational analysis that provided evidence of associations between psychological, demographic and experiential variables as identified on the *Participant Information Form (PIF)* and teaching skills as measured by the *TOF*. Significant correlations were found between the background variables of training in gifted education, type of school and program taught, support for gifted education programs, undergraduate average grade, satisfaction with teaching position, number of years teaching gifted students and teaching skills as measured by the *Teacher Observation Form (TOF)*.

Therefore, hypothesis three was confirmed as significant correlations were found between psychological, demographic and experiential variables and teaching skills.

The final part of the data analysis revealed the results of the correlational analysis that provided evidence of significant associations between psychological, demographic and experiential variables as identified on the *Participant Information Form (PIF)* and classroom climate as measured by the *CAQ*. Significant associations were found between training in gifted education, type of program taught, support for gifted education programs, number of years of regular classroom teaching, the year level taught and the teachers' satisfaction with their teaching position and classroom climate.

Therefore, hypothesis four was confirmed as significant correlations were found between psychological, demographic and experiential variables and the classroom climate.

The results of the qualitative analysis of the open-response items of the *Class Activities Questionnaire (CAQ)* provide further evidence for the specialised teacher training of teachers in gifted education. Thus, in summary, the results of both the quantitative and qualitative analyses confirmed that teaching skills and classroom climate were significantly affected by specialised training in gifted education.

CHAPTER 6

DISCUSSION

6.1 INTRODUCTION

"It is wishful thinking to suppose that hardworking teachers, without specific content knowledge of gifted children ... will be able to alter the educational situation for gifted children to any meaningful degree" (Rogers, 1989, p. 145).

As a culmination of the previous five Chapters, this Chapter provides a summation of responses to the research questions framed in Chapter One and discusses the appropriateness of the theoretical framework underpinning the literature reviewed in Chapters Two and Three in relation to the findings presented in Chapter Five. It also responds to the research hypotheses detailed in Chapter Four. The limitations of the study, recommendations for the research findings in both theory and practice and the implications for future research are outlined in Chapter Seven.

The research questions (see page 14) reflected the aims of the study and will be responded to in the discussion throughout this Chapter. The aim of this Chapter is, therefore, to discuss the results of the present study in relation to the research questions posed in Chapter 1 and to link it to the literature reviewed in Chapters 2 and 3.

The first major finding of this study, that teachers *trained* in gifted education demonstrated more of the competencies identified as successful teaching skills and had a more positive classroom climate than the *untrained* teachers, is hardly

surprising, given the results of earlier studies. However, the findings of this study also show that teachers still in training, were more like their *trained* colleagues than they were like their *untrained* colleagues. Furthermore, this superiority was independent of any other background variable - gender, type of program taught, teaching subject or years of teaching experience. The fact that the *trainees* were as accomplished as the *trained* teachers was perhaps unexpected. The unexpected finding lends support to the effect of training on observable teaching skills and classroom climate.

The superiority of even the *trainees* over the *untrained* teachers may be due to the quality of the courses in which the *trainee* teachers were engaged. The Certificate of Gifted Education (COGE) and the Gifted Education specialisation within the Master of Education (M.Ed.) programs at the University of New South Wales (UNSW) are highly rigorous in their content. These two specifically designed, specialised teacher training programs allow *trainee* teachers to study in-depth a range of gifted education related topics that have a practical application in the classroom. The level of academic rigour in the specific course content of these two specialised teacher training programs is an integral factor of their success. Additionally, the majority of the *trainee* teachers enrolled in The Certificate of Gifted Education (COGE) program had completed 60 hours of the 75 hour program.

The first aim of this study was to examine observable differences in teaching skills and classroom climate of *trained*, *trainee* and *untrained* teachers who were teaching gifted and talented students in New South Wales and Australian Capital Territory primary and secondary schools. The study investigated teaching skills through an observational rating instrument and the classroom climate through

examining responses to a questionnaire completed by identified gifted and talented students. The statistical analysis of the data collected showed that *trained* and *trainee* teachers demonstrated significantly more effective teaching skills and had a significantly more positive classroom than the *untrained* teachers.

The degree to which the teacher and school background demographic data affected the significance of teaching skills or classroom climate was also examined. In the present study, training was determined as a quantitative variable, however, pre-treatment differences in the present study's sample were not determined by any demographic information collected. The study used a 'posttest only' design which did not allow for a comparison of the groups before the treatment (i.e. training). There is no evidence from the data collected which establishes the pre-treatment equivalence of the three groups. Evidence of one pre-treatment difference, from the literature, is that the trained and trainee teachers in the Gross (1994c) study had more positive attitudes toward gifted education even before entering their specialised teacher training program (COGE).

The second aim of the study was to test and validate the extent of these background variables including the presence of specialised training in gifted education. The results clearly support that training in gifted education produces a more effective classroom climate with *trained* and *trainee* teachers using more effective teaching skills to facilitate learning for the gifted student.

The *trained* and *trainee* groups of teachers (most of whom undertook COGE or specialised in gifted education within the M.Ed. program at UNSW) received instruction in grouping principles and practices and, therefore, they understand

how to cater for the individual needs of the gifted student. It perhaps explains why most of the *trained* teachers participating in this study were teaching ability grouped classes.

As described in detail in Chapter Four, the five COGE strands include models of giftedness; identification of gifted students; differentiating the curriculum; developing programs for gifted students and the social and emotional development of gifted students. The *trainees* are expected to utilise stringent research methodology to guide them in the administration of the Gagné-Nadeau attitude questionnaire. This example of the rigorous course content of the specialised training programs in gifted education provides an explanation for why the *trainees* were similar to the *trained* group of teachers in this study. In fact, Gross (1994c) in her study, found that COGE has a positive and strong impact on participants' attitudes towards training. Particularly, she found that the academic rigour, the structure of the course, the emphasis on gifted education interventions, the opportunity to work with international leaders, the feeling of empowerment gained through exposure to the current research and the interaction with a large group of teachers with similar attitudes and interests were significant in the participants' positive attitude toward the training (Gross, 1994c).

The five assignments (each with a minimum of 2,000 words) coupled with 75 hours of class contact (COGE at UNSW), comprise a demanding and rigorous course work load that ensures that the *trainees* are exposed to the research literature and theory underpinning the education of gifted students. The results of this study for the *trainee* group are significant in determining COGE and the M.Ed. (gifted education subjects) as successful specialised teacher training programs. Even

participation in the first nine months of the training program raised teaching skills and classroom climate significantly beyond those of teachers who had not participated in such training.

Based on the literature relating to studies of effective teaching skills and classroom climate for gifted and talented students, several factors were identified as influential in decisions made by teachers to employ certain teaching skills in the classroom. These issues will be discussed in relation to the research questions and other pertinent issues, such as the recommendations of the 2001 Senate Employment, Workplace Relations, Small Business and Education Committee report on the education of gifted children, discussed in Chapter Three.

As demonstrated in the proposed model presented in Chapter Two, a combination of factors including desirable characteristics, teaching skills, teacher training, teacher competencies, experiential factors and affective and cognitive catalysts need to be considered when addressing research question one. This Chapter explores each of the research questions in relation to the wider research literature and the findings of this study. Chapter Seven responds to the hypotheses that emerged from the research questions.

6.2 PRINCIPAL ANALYSIS: SPECIALISED TRAINING IN GIFTED EDUCATION AND TEACHING SKILLS

"Effective teachers of the gifted...showed care and respect, were firm and fair in their dealings with students, and used physical closeness to further demonstrate these qualities" (Wendel & Heiser, 1989, p. 152).

Teaching Skills used in teaching gifted and talented students as identified by the Teacher Observation Form (TOF)

Teachers who were *trained* or *undertaking training* in gifted education demonstrated more appropriate teaching skills than those who were *untrained* in gifted education according to the findings of this study. Significant differences were found between *trained* and *untrained* teachers and between *trainee* and *untrained* teachers on all 12 items on the *Teacher Observation Form* [$F_{(12,97)} = 11.5, p < .001$]. The results of the *trained* and *untrained* group is consistent with the findings of Hansen (1988) who also found that there were significant differences between *trained* and *untrained* teachers in the United States on all 12 items as measured by the *Teacher Observation Form (TOF)*. The results, however, of the *trainee* and *untrained* group is far-reaching as it shows that the *trainee* teachers were more like their *trained* colleagues than their *untrained* colleagues.

The training program that the majority of the *trainees* and *trained* teachers undertook (COGE) included subjects focussing on the development of successful teaching strategies for the gifted and talented student. The COGE program is academically rigorous as it has 75 class contact hours and five post-graduate level assignments of 2,000 words each are completed by participants over a 15 month period. Some of the *trainees* and *trained* teachers were engaged in a Master of

Education (M.Ed.) specialising in gifted education. The rigour of these M.Ed. subjects is also a feature of the training. For example, a gifted education subject within the M.Ed. called 'Curriculum and teaching strategies for intellectually gifted students' examines current research and appropriate curriculum design, teaching methodologies and resources for use with the gifted. A 5,000 word assignment is required that asks the teachers to develop a curricula and to detail the instructional methods used for implementing the curriculum. This gives the teacher a foundation in the theoretical approach to curriculum design coupled with the experience of a practical application of the teaching strategies that are reported as effective with gifted students. As the *trained* and *trainee* groups were significantly more effective than the *untrained* group in teaching skills (as measured by the *TOF* in this study) it is clear evidence of the success of the specialised teacher training programs mentioned.

Each item of the *Teacher Observation Form (TOF)* will be explored based on the findings of this study and the literature reviewed in Chapters Two and Three. To begin, the items with the strongest result will be summarised. The teaching skills that discriminated most strongly between the *trained* and *untrained* groups and the *trainee* and *untrained* groups were items 2, 3, 9 and 10. The following Table 6.1 shows the research studies that supported the importance of the four highest ranked variables examined on the *Teacher Observation Form (TOF)*. The alpha co-efficient as shown in the following four items detailed in Table 6.1 demonstrate the teaching skills, as measured by the TOF, that discriminate the most between the groups -the *trained* and *untrained* groups and the *trainee* and *untrained* groups of teachers. The alpha reported (above .65 is strong.) shows the strength of the relationship between the level of training and the teaching skills.

Table 6.1: Summary of *Teacher Observation Form (TOF)* items ranked highest in a comparison of *trained* and *untrained* teachers and the *trainee* and *untrained* teachers

<p>Item 2 clarity of teaching (alpha = .77)</p> <ul style="list-style-type: none"> • verbal and non verbal communication skills • clear and specific directions • all necessary points dealt with • sufficient examples and illustrations • student comprehension as evidenced by responses and involvement 	<p>Feldhusen and Huffman (1988) - this was the third strongest item from their findings. Hansen (1988) Hansen and Feldhusen (1994) Hultgren and Seeley (1982) Silverman (1980)</p>
<p>Item 3 motivational techniques (alpha = .83)</p> <ul style="list-style-type: none"> • teacher energy and enthusiasm • variety • student enthusiasm 	<p>Feldhusen and Huffman (1988) - this was the fourth strongest item from their findings. Gallagher (1985) Hansen (1988) Hansen and Feldhusen (1994) Rizza and Gentry (2001) Whitlock and DuCette (1989)</p>
<p>Item 9 emphasis on higher-level thinking (alpha = .68)</p> <ul style="list-style-type: none"> • Bloom's Taxonomy evidenced in teacher questioning, activities, teaching aids • Critical thinking 	<p>Feldhusen and Huffman (1988) - this was the strongest item from their findings. Gallagher (1985) Feldhusen and Hansen (1987) Hansen (1988) Hansen and Feldhusen (1994) Hultgren and Seeley (1982) Keirouz (1993) Rizza and Gentry (2001) Seeley (1979) Solman and Rosen (1986) Starko and Schack (1989) Wyatt (1982)</p>
<p>Item 10 emphasis on creativity (alpha = .48)</p> <ul style="list-style-type: none"> • creative thinking skills (fluency, 	<p>Gallagher (1985) Hansen (1988) also ranked fourth</p>

flexibility, originality) <ul style="list-style-type: none"> • accepting atmosphere • encouragement of risk taking • open ended questioning 	strongest from her findings Hansen and Feldhusen (1994) Hultgren and Seeley (1982) Starko and Schack (1989)
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Item 1 Subject matter coverage

Item 1 explores the use of concept orientation, teacher expertise and subject depth and breadth to indicate a measure of the teacher's subject matter coverage. The *trained* and *trainee* teachers demonstrated greater teacher expertise, a broader and deeper study of a topic and utilised more concept orientation than those teachers who were *untrained* in gifted education. Evidence of the importance of this teaching skill was also found by Feldhusen and Hansen (1987) who indicated that the teachers teaching in Super Saturday should be knowledgeable in general, whilst Gallagher (1985) stated that a demonstration of superior intellect by the teacher was necessary to achieve excellent subject matter coverage. Rizza and Gentry (2001) found agreement amongst six contemporary leaders in gifted education that successful teachers of the gifted needed to present subject matter with a depth and breadth of the content material.

Silverman (1980) found that Master teachers demonstrated stronger content area knowledge than the novice teachers and Hanninen's (1988) findings revealed that expert teachers had a broader theoretical understanding of the subject matter and displayed an expertise in pedagogy. Whitlock and DuCette (1989) found that the outstanding teachers in their study were able to apply a depth of knowledge to the lesson content. Although Feldhusen and Huffman (1988) used a different version of the *Teacher Observation Form* (item 10 'emphasis on creativity' and item 11

'lesson planned with flexibility and student-centered' were not included), item 1 was reported as the second strongest in their observation of *trainee* teachers in a gifted education teaching practicum. The findings from item 1 of the present study, therefore, clearly support the literature on effective teaching skills for gifted students.

Item 2 clarity of teaching

Item 2 investigated the level of clarity in the teaching of gifted students and indicators such as verbal and non-verbal communication skills were observed in the *trained* and *trainee* teachers' classrooms. It is clear that the teachers who were *trained*, or currently *in training*, evoked a high level of communication and good student comprehension, as was evidenced in the student response to specific directions and their involvement in the lesson. *Untrained* teachers appeared to focus on unnecessary repetition and, at times, failed to deal adequately with all points relevant to the understanding of the topic.

The teacher's ability to address all necessary points, to give sufficient examples and illustrations (in an attempt to foster student comprehension as evidenced by student responses) and to be involved in the lesson were skills also observed in the *trained* and *trainee* teachers' classes. Hultgren and Seeley (1982) found that teachers who were *trained* in gifted education used verbal communication skills through successful questioning techniques. Item 2 was ranked the third strongest by the findings of Feldhusen and Huffman (1988) whereas this item proved to be the strongest result in the present study. Thus, the findings of the present study support the literature on effective teaching skills for gifted students.

Item 3 motivational techniques

The data analysis revealed that the teachers *trained*, or *currently training*, demonstrated greater motivational techniques (requiring energy and enthusiasm from the teacher to promote student enthusiasm) than the *untrained* teachers. The research studies, reviewed in Chapter Three, noted enthusiasm as being a desirable characteristic and a teaching skill found in successful teachers of gifted and talented students. In fact, Feldhusen and Huffman (1988) reported that this teaching skill was the fourth strongest item in their observation of *trainee* teachers. In Gagné's 'Differentiated Model of Giftedness and Talent' (1995) motivation is included among the key *catalysts* impacting on the learning, training and practice continuum. Environmental and Intrapersonal catalysts appear in the proposed model of teacher effectiveness (presented in Chapter Two) and a discussion of the relevance of the proposed model on this study's findings is included at the conclusion of this Chapter.

The finding of motivational techniques as an effective teaching skill with *trained* and *trainee* teachers in this study supports the research literature (Cashion & Sullenger, 2000; Hansen, 1988; Hansen & Feldhusen, 1994) who indicated motivational techniques as being an essential teaching skill for teaching gifted students. Whitlock and DuCette (1989) and Rizza and Gentry (2001) reported enthusiasm and the ability to motivate students and provide opportunities as desirable teaching skills for effective teachers of the gifted student. This result may indicate greater effectiveness of the UNSW training program. Teachers who were *trained* or *undertaking training* demonstrated this skill more effectively than those who were *untrained* in gifted education.

Item 4 pace of instruction

The results indicate that the pace of instruction was appropriate and the individual needs of the students were accommodated more effectively by the *trained* and *trainee* teachers than the *untrained* group. Witty (1950), Hanninen (1988), Hansen and Feldhusen (1994) and Kanevsky (1995) reported that a successful teacher of the gifted individualises instruction and uses appropriate pace for the group and the individual. The *untrained* group in this study used unnecessary repetition, drill and examples when instructing and the pace of the lesson was not always appropriate for the group or the individual. Rogers (1986) notes that the teacher of the gifted must teach to meet the needs of the individual in the classroom and that to do this, the teacher must first recognise individual differences. The findings of the present study support the literature stating that the teaching is more effective for gifted learners when instruction is well paced, appropriate for the group and individual needs are met. This result may indicate greater effectiveness of the UNSW training program.

Item 5 Opportunity for self-determination of activities by students

This study found that *trained* and *trainee* teachers allowed students to assist in determining the activities relevant to the outcomes of the lesson both in class and as a follow-up at home for further study. A democratic rather than autocratic approach by the teacher, is postulated by Lindsay (1980) who believes that the student should be able to negotiate expectations with the teacher to better facilitate learning. Starko and Schack (1989) reported that teachers who allow students to pursue a research interest (negotiated previously with the teacher) demonstrated more effective teaching than those who did not. Hanninen (1988) reported that

successful teachers of the gifted gave responsibility to students and encouraged students' interest outside the curriculum. The role of teacher as facilitator, to assist with self-determination of activities, is reported by Whitlock and DuCette (1989) and the significance of this teaching skill is upheld by the adult learning literature presented in Chapters Two and Three. A facilitative approach to learning increases the responsibility of the student and allows the teacher to reflect on the teaching and learning process through constant re-evaluation of the content, process and product goals negotiated with the student.

Lindsay (1980) notes that a concept of 'self' is a result of a combination of experience, perceptions of others and the acquisition of skills and knowledge. If the teacher of the gifted can induce a positive self-concept in students, then the learners will utilise the skills modelled by the teachers to develop their own self-concept. Self-concept is a positive motivational tool that assists in the learning process for gifted students.

Item 6 Student involvement in a variety of experiences

Students who were in the classrooms of *trained* or *trainee* teachers were offered the opportunity to become involved in a variety of experiences including small group discussions and activities, creative thinking and future problem solving. The results of this study revealed that the *trained* and *trainee* teachers emphasised independent study and individualised learning, thus acknowledging the gifted individual's need to be involved in a variety of learning experiences. It was apparent that the *untrained* teachers led the students through a less flexible and more directed path of learning and maintained the same pace for each individual in the group. This method of teaching fails to acknowledge the individual differences

of the group. It also hinders the teacher's ability to appropriately match the needs of the learner to the learning, as "...optimal learning arises when educational opportunities are responsive to a student's interests, abilities and prior knowledge" (Kanevsky, 1995, p.161).

A differentiated and flexible approach by the teacher assists the student to accept individual differences and to respect the ideas of others offered in class discussions. This, in turn, promotes problem solving, independent learning processes and facilitates whole group learning. Training, as a significant factor in effective teaching of gifted students, is in accordance with the work of Gallagher (1985), Feldhusen and Hansen (1987), Hansen (1988), Hansen and Feldhusen (1994), Hultgren and Seeley (1982) and Starko and Schack (1989) who all reported that effective teachers of the gifted promoted student involvement in a variety of learning experiences.

As item 6 was the only item on which a significant difference appeared between the *trained* and the *trainee* groups it is worthy of further investigation and further research on this will be recommended in Chapter Seven. Teacher education program goals in gifted education list student involvement in a variety of experiences as a competency required to be demonstrated by *trainee* teachers (Feldhusen, 1985). Feldhusen and Huffman (1988) found this item rated the fourth most observed skill in their observation of *trainee* teachers on practicum. It would appear that the *trainees* were not as competent at providing a variety of experiences for their students as the *trained* teachers, perhaps because they did not have the same length of teaching experience with *gifted* students as the *trained* teachers had or perhaps this had not yet been covered in their specialised teacher

training program. The significant findings of this study demonstrate clearly the effect of training so perhaps this would be an interesting avenue of further research.

**Item 7 Interaction between teacher and student, student and peers,
is appropriate to lesson objectives**

The *trained* and *trainee* teachers were found to initiate activities that promoted group learning, with an emphasis on respect for the individual and their ideas, more effectively than the *untrained* group. This process of guiding the students in their learning is noted by Lindsay (1980) and by Hansen and Feldhusen (1987) as being a teaching skill that focuses the learning in the classroom away from the teacher and onto the student. The *untrained* teachers in the present study were less effective in creative thinking and problem solving and in encouraging the independent study process than the *trained* or *trainee* teachers. Promotion of problem solving and independent inquiry is also noted in the research of Wyatt (1982), Gallagher (1985), Silverman (1980), Feldhusen and Huffman (1987). In fact, a comparison of the literature discussed in Chapters Two and Three with the present study clearly indicates that this is an essential teaching skill for successful teachers of the gifted.

Item 8 Opportunity for student follow-through for homework

The present study found that teachers *trained* or currently *undertaking training* were significantly different to the *untrained* teachers on this item. Hansen and Feldhusen (1994) reported that this item (opportunity for student follow through) was not found to be significant in their research. This item relates to the teacher's ability to encourage and assist students with further study as a follow-up from the

lesson content. The teacher's encouragement and assistance to the student to investigate further outside the curriculum (to expand the students' interest) was reported by Hanninen (1988). This item also included an 'open ended' approach by the teachers allowing for creativity and individual interest. Teachers should strive to encourage students in their interest area and gifted students need the opportunity to use the content presented in class and to continue onto further investigation at home.

Item 9 Emphasis on higher-level thinking

The teachers who were *trained* or currently *undertaking training* showed greater emphasis on higher-level thinking skills than the *untrained* teachers in this particular study. Evidence that Bloom's (1960) Taxonomy was used effectively in the classrooms of the *trained* and *trainee* teachers was significant in the results of this study. This could be attributed to teachers' exposure to this particular teaching strategy in their specialised teacher training program, together with their greater understanding of how the gifted student requires a differentiated approach to their curriculum and learning. This result may indicate greater effectiveness of the UNSW training program. Kanevsky (1995) advocates a smorgasbord of curriculum options to assist the gifted student in their learning.

Thus, the comparisons of the present study with those researchers listed in Table 6.1 support that the teaching skill emphasising higher level thinking skills is effective. The *untrained* teachers appeared to be less encouraging of critical thinking in their classrooms as was evidenced in their lack of expertise in questioning skills. Feldhusen and Huffman (1988) found this teaching skill rated equal highest in their observation of *trainee* teachers on practicum.

When discussing the educational needs of the gifted and talented students, it is apparent from the research that teachers who are able to encourage higher level thinking (Hansen and Feldhusen, 1994; Hultgren and Seeley, 1982; Seeley, 1989); are able to differentiate their teaching material appropriately to meet the needs of the gifted child (Keirouz, 1993; Rogers, 1989; VanTassel-Baska, Feldhusen, Seeley, Wheatley, Silverman and Foster, 1988) and obtain an 'optimal match' between student's ability and educational challenge (Hoekman et al., 1999; Kanevsky, 1995) are effective teachers of the gifted. The teacher of the gifted really does have a responsibility far greater than can be summarised in a list of teaching skills and competencies. Keirouz (1993) encourages teachers to teach students to think and to apply their thinking in important areas of human endeavour.

Many of the lists of teacher characteristics, teaching skills and competencies (included in Chapter Three) incorporate the importance of higher-level thinking skills. The recommendation indicated here by Keirouz (1993) contributes to the list of teaching skills by describing how the teacher of the gifted student can, in fact, provide more in-depth learning experiences through a greater exploration of the set curriculum and by encouraging the student to apply their thinking.

Item 10 Emphasis on creativity

This item was found to be the fourth strongest both in this study and in Hansen's (1988) study. It was found that the students' who were encouraged to think creatively, using flexibility, fluency and originality, are more capable of independent study than those who are not encouraged. Teachers who facilitate creative

thinking produce an encouragement of risk taking by the student. The present study found teachers *trained* or *in training* to be significantly different to the *untrained* teachers in providing an accepting atmosphere for creative thinking and in using open-ended questioning to encourage students in original thinking. The results of the study revealed that the *untrained* teachers emphasised creativity less than the *trained* or *trainee* teachers. Focussing on creative thinking skills stimulates and challenges the gifted and talented students and provides an avenue for encouraging risk taking. This finding supports the research literature listed in Table 6.1.

Item 11 Lesson plan well designed

The *trained* and *trainee* teachers demonstrated more flexible planning of the lesson content, process and product than the *untrained* teachers observed in this study. Teachers who demonstrate flexibility in their lesson planning have been noted by Seeley (1989) and Feldhusen and Hansen (1987) as successful teachers of the gifted. Keirouz (1993) and Kanevsky (1995) advise that teachers use flexibility when planning lessons to accommodate the individual needs of the learners. Based on the literature relating to studies that highlight lesson planning as a teaching skill, Whitlock and DuCette (1989) and Cashion and Sullenger (2000) reported the teachers who had completed training were better able to design flexible learning plans for gifted students that were student centered and facilitated learning.

Item 12 Use of teaching and learning aids

The data analysis revealed that an appropriate use of clearly printed and grammatically correct learning and teaching resources was found as significant in the *trained* and *trainee* teachers' classrooms. This result may indicate greater effectiveness of the UNSW training program. The development of appropriate materials by effective teachers of the gifted was also reported by Hansen (1988), Hultgren and Seeley (1982) and Feldhusen and Huffman (1988). Feldhusen and Hansen (1994) found that teachers who prepared appropriate material, and who were creative in their design of the learning resources, were successful teachers of gifted students.

Summary of teaching skills

Hansen (1988) had three times as many *trained* teachers as *untrained* teachers in her study, which could partially account for the increased number of *Teacher Observation Form (TOF)* items on which significant differences were found. The present study's population consisted of 58% *untrained* teachers and 42% *trained* in the comparisons between '*trained* and *untrained*'. However, there were 28% *trainees* and 72% *untrained* in the comparison between *trainee* and *untrained* which was similar to Hansen's (1988) study of 26% *trained* and 74% *untrained* (Hansen, 1988). The level of significance was still evident when the sample in this study was split by primary and secondary school.

The training of teachers, in tertiary institutions, to be effective teachers of the gifted has been a much debated topic amongst the experts in gifted education. They all agree, however, that training and professional development for teachers currently teaching gifted students is necessary to ensure that the essential teaching skills

and competencies required to be effective in teaching the gifted student are acquired. The results of this study show that the *trainee* teacher is more effective than the *untrained* teacher even though only half-way through his 75 hour training program.

Learning how to think efficiently, learning how to learn and learning about learning (Rogers, 1989) are important aspects of teacher training programs. Rogers (1989) suggests that if teachers of the gifted are to be trained as expert teachers of the gifted then training in 'how to think differently' and 'learning how to learn' should be included in the teacher training programs. Rogers, (1989) views the training of teachers as a metacognitive approach (knowing about knowing, thinking and learning), which supports the adult learning theorists (Kolb, 1984; Knowles, 1984; Schön, 1987). Effective teachers of gifted students strive for an optimal match between the resources available in the school, the program or the provision and the learners' individual profile (Kanevsky, 1995). The specialised teacher training (COGE) provides teachers with training in how to achieve this optimal match.

6.3 TEACHER TRAINING AND THE CLASSROOM CLIMATE

"...optimal learning is facilitated when educational opportunities are not only responsive to students' interests, abilities, and individual differences, but actually extend their prior knowledge...one of the essential goals for educators becomes the provision of a level of challenge beyond the current level of skill exhibited by the student..." (Hoekman, McCormick & Gross, 1999, p. 173).

The classroom climate and training in gifted education

Trained and *trainee* teachers were found to have more positive classroom climates than the *untrained* teachers by selected, gifted students. More specifically, the *trained* and *trainee* teachers emphasised higher-level thinking [$F_{(1,109)} = 9.38$, $p < .005$] and had a significantly more positive classroom focus [$F_{(1,109)} = 9.39$, $p < .005$]. The *trained* and *trainee* teachers lectured less and acknowledged students' feelings more than the *untrained* teachers – according to the perception of selected gifted students. The results also revealed that the *trained* teachers conducted more discussion than the *untrained* teachers and this specific result supports the findings of Hansen (1988). Based on the literature relating to studies on classroom climate, a number of factors were identified as being significant in the production of a positive classroom climate.

Steele (1981) has shown that the instructional climate created by the teacher of the gifted greatly affects the students' learning and the classroom climate. Teachers who emphasise higher level thinking and who negotiate activities with the students are more able to provide an instructional climate that motivates, enthuses and encourages learning (Steele, 1981). Broad outcomes such as independence, motivation and enthusiasm were found amongst the students' perceptions of the classroom climate in this study which supports Steele's (1981) findings.

Independence, motivation and enthusiasm were not measured in the present study for their strength but rather how these factors acted as an indication of the effect that training had on observable teaching skills and classroom climates. Independence, enthusiasm and motivation were identified by the factor analysis (see Table 5.13) of the *Classroom Activities Questionnaire (CAQ)* in this study, and the results suggest that they are important determinants of the learning environment. It must be emphasised only selected, gifted students were surveyed on their perception of classroom climate in this study.

Teachers who undertake COGE, and specialised gifted education subjects within the M.Ed. program at UNSW, are exposed to a rigorous academic course content that prepares them for managing the classroom climate in a variety of grouping situations. As the results of this study showed that the *trainee* teachers were more like their *trained* counterparts at producing a positive classroom climate, it can be assumed that the effect of training, even though the training was not completed, is significant. Kanevsky (1995) states that "...educators with an understanding in of the sources of individual differences in learning potential are better prepared to create appropriate, diverse learning environments" (p. 162).

One of the gifted education subjects offered in the M.Ed. program at UNSW is 'Social and emotional development of intellectually gifted children'. This academically rigorous post-graduate course covers previous and current research in the social, moral and emotional development of children with high intellectual potential. The subject examines the teaching strategies and classroom structures that can facilitate the development of positive social attitudes and supportive peer relationships with gifted and talented students. This level of examination in the

specialised teacher training program assures that the *trained* and *trainee* teachers have the tools and resources required to establish a positive classroom climate. The results of this study support the success of the training even for the *trainee* teachers who had not yet completed the teacher training program.

Nine factors were identified in the data analysis of this study as being significant in the production of a positive classroom climate. Included in these factors were the five factors identified by Steele (1981) as being appropriate to the teaching and learning of gifted students: student involvement and enthusiasm in class activities, promoting an intellectual atmosphere, higher-level thought processes, fostering independence and divergence (Steele, 1981). The factors indicating positive classroom climate (as identified by Steele, 1981) are similar to the factors identified by the *Teacher Observation Form* as successful teaching skills.

The classroom climate is determined by processes initiated by the teacher, the students' perception of the instructional techniques and the personality of the teacher. For instance, personal characteristics and individual and group dynamics act together to impact on the classroom climate. Interactions between the student and the teacher can vary enormously and, if the teacher uses teaching skills to promote a positive classroom climate, student learning is facilitated. Control of these interactions is usually in the hands of the teacher and this is most often seen in the level of class discussion and whole class groupwork, and the ability of the teacher to deal with alternate ideas and activities suggested by the students. A complex range of activities can and do exist in the classroom (Steele, 1981). These all need to be considered when addressing the second research question in this study.

The qualitative and quantitative data collected from the *Class Activities Questionnaire (CAQ)* were complementary. The qualitative data were categorised according to cognitive and affective categories defined by Steele (1981) – see *Appendix B*. For example, the statistical analyses showed that the *trained* and *trainee* teachers had a more positive affective and cognitive classroom climate than the *untrained* teachers. Students' responses in the classrooms of *trained* and *trainee* teachers included a strong emphasis on the teacher's role in determining the atmosphere in the classroom. The results of the present study support the findings of previous studies and indicate that effective teachers of the gifted involve students more often in a classroom community and a structured learning experience. This, in turn, means that the individual has an opportunity to improve the quality of their own life and the life of the classroom community (Gentry et al., 2001). In fact, the study of Master teachers by Silverman (1980) concluded that these teachers were personally involved in the lives of the students and at times, assumed a counselling role. As the central person in the classroom, the *trained* and *trainee* teachers were significant in determining the positive classroom climate.

Research relating to enthusiasm was described by Witty (1950), Sisk (1975) and Feldhusen (1985). Student involvement was reported by Gallagher (1985), Feldhusen and Hansen (1987), Hansen (1988), Hultgren and Seeley (1982) and Starko and Schack (1989). Many of the research findings presented on teacher characteristics and competencies, describe the effectiveness of classroom climates that promote an intellectual atmosphere and higher-level thinking in determining a student's independence and divergence. An accepting atmosphere promoted by the teacher produces a positive classroom climate because it fosters a greater sense of independence and respect amongst the students.

Summary of classroom climate

Descriptive statistics for the *trained*, *trainee* and *untrained* teachers in gifted education showed that there were significant differences between the three groups in assessing classroom climate. This finding supports the research literature outlined in Chapter Three and the discussion has provided a clear response to research question two to determine that training in gifted education impacts significantly on the classroom climate.

The various forms of ability grouping employed by the *trainee* and *trained* teachers may have assisted in the establishment of a positive classroom climate. The *trainee* teachers, most only part way through COGE or M.Ed. teacher training programs at UNSW, demonstrated positive classroom climates similar to the *trained* group of teachers. Those teachers who *undertake training* in gifted education are taught about grouping options and part of their training includes the methodology and practical application of ability grouping gifted students. For example, Strand 4 of COGE examines practical strategies for establishing ability, achievement or interest grouping and the many forms of accelerated progression. The teacher must consider the impact of the learning environment on the learning potential as these two factors interact with the intellectual potential of the individual student (Kanevsky, 1995).

6.4 CORRELATIONS: BACKGROUND VARIABLES AND TEACHING SKILLS

"As a teacher training vehicle, systematic observation facilitates the transfer of learner-supportive behaviours and teacher self-awareness in the classroom" (Hobar & Sullivan, 1984, p. 28).

Teacher's background variables and teaching skills

In order to test and validate research question three, evidence was accumulated specifically through correlation analysis of the background variables determined by the *Participant Information Form (PIF)* with a total score from the *Teacher Observation Form (TOF)* to ascertain if there were any associations between teaching skills and background variables.

A positive significant association between teaching skills and training in gifted education ($r = .55$, $n=167$, $p < .05$) was revealed by the data analysis. These findings are complementary to the results and discussion of the first research question pertaining to the effect of training in gifted education. Hansen and Feldhusen (1994) also found that training in gifted education was significant ($r = .64$, $n=82$, $p < .0001$) in assessing a relationship between teaching skills of effective teachers of gifted students and background variables.

This study found a significant association between teaching skills and type of program taught ($r = .53$, $n=167$, $p < .005$). Hansen (1988) found that the teachers teaching in cluster, pull-out and self-contained gifted classes demonstrated greater teaching skills than teachers in other types of programs ($r = .68$, $n=82$, $p < .001$). The present study found students in pull-out or self-contained gifted groupings were associated with effective teaching skills more than

those in other programming options. Teachers who were *trained* or *undertaking training* demonstrated more effective teaching skills when teaching homogeneous grouped classes of gifted students. The teachers who *undertake training* in COGE or the M.Ed. gifted education subjects at UNSW are trained in the theoretical principles and practical application of ability grouping. The exposure to these grouping principles and practices not only raises their awareness and gives them a theoretical rationale but also encourages the teachers to strive for appropriate grouping practices in their schools. Perhaps the *trained* and *trainee* teachers were able to influence the schools in their decision to establish these well researched and validated grouping structures.

The correlation coefficients presented in Table 5.18 were significant and this would suggest that the associations between certain background variables identified on the *Participant Information Form (PIF)* and the total score on the *Teacher Observation Form (TOF)* is strong. A significant association between teaching skills and support for gifted programs was found in the present study ($r = .31$, $n=167$, $p < .001$). Hansen and Feldhusen (1994) also found that this background variable 'support for gifted programs' was positively associated with teaching skills ($r = .65$, $n=82$, $p < .001$). As both studies found an association between this background variable and teaching skills it may indicate a product of specialised training in gifted education – that is the performance of successful teaching competencies. If the teacher has elected to be trained then perhaps they have already given strong support for the educational programming for gifted students. Gross (1994c), in her study of teacher attitudes, found that teachers entering post-graduate study in gifted education already had more positive attitudes to special education provisions for gifted students. In fact, the trainees in her study were

more positive in their attitude toward gifted programs and provisions for gifted students than their professional colleagues.

A significant association between teaching skills and undergraduate average grade ($r = .28$, $n=167$, $p < .005$) was revealed in the data analysis. This finding is in accordance with the work of Bishop (1968), Feldhusen (1985), Hultgren and Seeley (1982), Maker (1975), Persson (1999) and Witty (1950) who studied desirable teacher characteristics and found high intelligence to be a characteristic in the teacher of gifted students. This study found that the *trained* and *trainee* teachers had significantly higher undergraduate average grades than did the *untrained* teachers. Nearly half of the *trained* teachers group and almost 40% of the *trainee* teachers had an undergraduate average grade of distinction and above in comparison to only one-fifth of the *untrained* teachers group. Nine out of 10 *trained* and eight out of 10 *trainees* had a credit average grade and above, in comparison to the *untrained* group where only six out of 10 had a credit average grade and above.

A significant relationship between teaching skills and year level taught for the observation ($r = -.28$, $n=167$, $p < .005$) was shown in the results of the present study. Hansen and Feldhusen (1994) also reported an association between teaching skills and year level taught ($r = .21$, $n=82$, $p < .05$). It is noted, however, by Hansen and Feldhusen (1994) that this may be a result of the disproportionate number of primary and secondary teachers in their sample. The methods employed in the statistical analysis in the present study alleviated concerns regarding unequal numbers in the sample and further investigation is not warranted. The fact remains that significant differences were found between the

trained and *trainee* groups in comparison to the *untrained* group on the year level taught for the observation showing that training has an impact on observable teaching skills whether teaching at the primary or secondary level.

A positive association was found between teaching skills and satisfaction with the teachers' position at school ($r = -.20$, $n=167$, $p < .05$) and between teaching skills and number of years teaching gifted students ($r = .16$, $n=167$, $p < .05$). Dixon, Willis, Benedict and Grossman, (2001) reported on teachers *untrained* in gifted education (but with many years teaching experience) who were given intensive and individual professional development in teaching gifted students over a 12 month period. The article describing this process of professional development was entitled "Old dogs can learn new tricks" and is perhaps indicative of the objective of the professional development. The professional development training employed methods of coaching, mentoring and study groups and encouraged risk taking to develop skills in appropriate teaching strategies and in fostering positive classroom climates appropriate for gifted students. It was reported that these very experienced teachers developed skills to listen to students, relinquished rigid lesson plans, embraced flexibility and worked with higher-level thinking skills (Dixon et al., 2001). The teachers who undertook the professional development concluded that they promoted a positive learning environment and encouraged learning of gifted students just as the professional development had encouraged them to do.

COGE and the specialised gifted education subjects in the M.Ed. programs at UNSW provide currently practising teachers the opportunity to learn new "tricks" through the specialised teacher training program that provides academically

rigorous and intensive training. One of the five assignments in COGE's 75 hours of intensive training requires the *trainees* to develop a unit of instruction for gifted learners in either a mixed-ability classroom, a pull-out program or a self-contained class of gifted students. The teachers have to design the unit of instruction and describe the content, process and products of six lessons within the unit. This experience by the *trainees* in developing units of instruction, together with another assignment where the COGE students describes a particular gifted program developed for their school, is intensive training that the results of this study show to be successful in meeting the needs of gifted students.

The fact that seven of the background variables listed on the *Participant Information Form* were found to have positive associations with the teaching skills (as measured by the *Teacher Observation Form*) responds to research question three. The non-significant associations should not be dismissed and the notion of selection bias must be noted here. The drawing of a random sample of subjects (both teachers and students) would have been desirable and perhaps this finding of a non-significant association between teaching skills and four of the background variables cannot be dismissed.

Summary of background variables and teaching skills

The findings from this study revealed that certain psychological, demographic and experiential variables were associated with teaching skills as measured by the *Teacher Observation Form (TOF)*. Significant associations between teaching skills and training in gifted education, support for programming for gifted students, undergraduate average grade, type of program and year level taught, satisfaction with their teaching position and the number of years teaching gifted students

responds to research question three and again shows the effect of training in gifted education as significant.

6.5 CORRELATIONS: BACKGROUND VARIABLES AND THE CLASSROOM CLIMATE

"Three dimensions come together in an instructional setting: the aptitudes, intellectual dispositions and values of students; the materials and resources available as a content of study; and the climate for learning, including the perceived demands, norms of behaviour, rewards, and a variety of other influences on learners" (Steele, 1981, p. 13).

Background variables and Classroom climate

Gifted and talented students need to engage in higher-level and abstract thinking as they thrive in a classroom environment that is fast paced with a compulsory depth of intellectual tasks at higher levels of thought (Duwell & Bennet, 2000). Comparisons of the present study with the research literature reviewed in Chapters Two and Three clearly show that the those teachers *trained* and *undertaking training* in gifted education had more positive classroom climates than the *untrained* teachers. Whilst the findings provide an overall answer to research question four, there are aspects of the results that could be considered further.

There were six significant associations found between the *Participant Information Form (PIF)* and classroom climate as measured by the total score of the *Class Activities Questionnaire (CAQ)*. There was a significant positive association between classroom climate and type of program taught

($r = .52$, $n=285$, $p < .001$). This finding supports the study by Hansen and Feldhusen (1994) who found that the teachers teaching in cluster, pull-out and self-

contained gifted classes had a more positive classroom climate than teachers in other types of programs. The present study found that pull-out or self-contained gifted groupings were positively associated with classroom climate.

As previously discussed, the research literature has demonstrated that grouping practices improve academic achievement and many affective variables and, therefore, it is feasible that the classroom climate can also be positively affected by the grouping practices employed by the school. Indeed, it would seem unusual if the classroom climate was not more positive in ability grouped classes. Specialised training in gifted education contains the theory and practical application of grouping practices, which prepares the *trained* and *trainee* teachers in how to group appropriately. As the *trained* and *trainee* teachers had a more positive classroom climate than the *untrained* teachers, the success of the teacher training program is illustrated. Gross (1994c) found that teachers' opposition to ability grouping and acceleration declined over the course of the specialised teacher training (COGE) program.

The results, therefore, of this study, show that ability grouping practices by both the *trained* and *trainee* teachers significantly affected the classroom climate.

The results of the present study revealed a significant association between classroom climate and training in gifted education ($r = .31$, $n=285$, $p < .05$). This finding supports the research studies comparing *trained* and *untrained* teachers of gifted students (Hansen, 1988; Hanninen, 1988; Silverman, 1980). It is also in accordance with Hansen and Feldhusen (1994) who reported an association between teaching skills and training in gifted education ($r = .28$, $n=365$, $p < .001$).

The significant effect of specialised teacher training found in the present study can be directly related to the rigorous course content and the level of training in the previously mentioned COGE and M.Ed. subjects specialising in gifted education. These specialist teacher training programs are designed to equip teachers and administrators with the skills that assist them to identify gifted and talented students in their classes and to develop curricula and programs through which the gifted students may develop their potential more fully. As the teachers work with a team of internationally renowned experts in the education of gifted children, the standard of training is excellent.

The 2001 Senate Employment, Workplace Relations, Small Business and Education Committee (referred to as The Committee of Inquiry) on the education of gifted children, introduced in Chapter Three, stated as one of its 20 recommendations that States should provide more effective training and inservicing of teachers in gifted education. Recommendation 14 states *"...that state and territory education authorities should require, as a condition of employment, that newly post-graduated teachers have at least a semester unit on the special needs of gifted children in their degrees"* (The 2001 Report of the Senate Employment, Workplace Relations, Small Business and Education Committee, p. 96). The results of this study directly support the adopting of this recommendation made to the Commonwealth Government. In fact, Bailey (1998) recommends that "...educating more 'good people' be the main goal of advocacy..." for gifted and talented students in Australia and that "...it is essential that gifted education be the centrepiece of any advocacy" (p. 8).

The data analysis showed a significant association between classroom climate and support for gifted education programs ($r = .31$, $n=285$, $p < .001$). This finding validates the previous findings by Hansen and Feldhusen (1994) who also reported an association between classroom climate and support for gifted education programs ($r = .44$, $n=365$, $p < .005$). This finding also supports Gross (1994c), who reported a strong positive attitude toward gifted education programs and provisions by teachers who chose to enter COGE even before embarking on their specialised teacher training program. *“The group’s mean pre-test scores on the first three factors (awareness of the needs of gifted children, lack of objections to specialised services, and belief in the social usefulness of gifted persons) were all above the level...that indicates a “very positive” attitude toward the gifted”* (Gross, 1994c, p. 19).

The present study found a significant association between classroom climate and number of years teaching regular classes ($r = -.21$, $n=285$, $p < .05$) and type of school ($r = -.57$, $n=285$, $p < .005$). As no data were collected associating years of teaching experience with training in gifted education, it is not possible to determine whether those teachers with several years of regular teaching experience were also trained in gifted education. The association between type of school and classroom climate was probably due to the disproportionate number of primary and secondary teachers in the sample (70% primary in the trained group, 87% primary in the trainee group and equal numbers in the untrained group).

As previously mentioned, Dixon et al., (2001) reported on four experienced regular classroom teachers with 20 years experience who undertook an intensive professional development program in gifted education. At the conclusion of the

professional development, the teachers demonstrated successful teaching skills and competencies in teaching gifted students. The focus of this report was the effect of the training and not the years of teaching experience. Rogers (2002) notes that the newly trained teacher in gifted education, in comparison to the experienced regular classroom teacher, enthusiastically approaches the teaching assignment and has individuals' needs close at hand and responds appropriately to those needs.

The data analysis revealed a significant association between classroom climate and the *trained* and *trainee* teachers' satisfaction with their current teaching position ($r = -.21$, $n=285$, $p<.05$). Available evidence in the literature indicates that the teachers' level of education may have positive effects on their job satisfaction (Mottaz, 1986). Generally, education increases work satisfaction through availability of intrinsic rewards for teachers (such as autonomy and challenge). Job satisfaction amongst teachers is reported in the research literature and Jin's (1994) study using the Quality of Work Life Inventory reported that satisfaction with working life is related to intrinsic motivation. Ellis (1984) reports that teachers are motivated by intrinsic rather than extrinsic rewards (such as a sense of accomplishment) and that their morale is boosted through inservice education. Teachers obtain satisfaction through a sense of achievement in understanding and assisting students (Ellis, 1984). When a teacher acknowledges student's personal goals the "learners perceive the academic climate to be supportive and encouraging" (Hoekman et al., 1999, p. 172). Therefore, the satisfaction of the teachers' current position is linked to the intrinsic motivation of the teacher and this positive encouragement allows the students to view the classroom climate favourably.

Summary of open-response items on the CAQ

The open response comments collected from the CAQ support the preference for ability grouped classes by the gifted students. For example, students in the *trained* and *trainee* teachers classrooms stated that they enjoyed being with ‘like minds’ and knowing that the pace of the class was appropriate because they were grouped according to their ability (see section 5.6 for details of the open response items). Some comments from the students in the *trained* and *trainee* teachers’ classrooms include:

"I love this class! I don't want Miss B to leave as I just know it will all go back to how it was before when Science was not graded" (Student #138).

"I really appreciate the smaller class atmosphere. It allows for one to feel more involved and it also encourages one to work to achieve one's potential" (Student #146).

"There is a lot of encouragement about doing your best" (Student #5).

"I love this class! I was very angry (as were my classmates) when I discovered that next year English is not graded" (Student #2).

"Doing work at our own level is the best thing" (Student #214).

It was apparent that none of the students surveyed were unhappy with the classroom climate or focus in the *trained* and *trainee* teachers’ classrooms. Also apparent was that none of the students surveyed in the untrained teachers’ classrooms were complimentary towards the classroom climate and focus. Some of the comments from the untrained teachers’ classrooms were also specific to the lack of classroom focus and an unstimulating classroom climate. Specifically, the

comments were critical of the teacher's lack of cognitive appropriateness for the gifted and talented learners in the class. Following are some examples from the untrained teachers' classrooms:

"To be able to choose what we read - the books are too easy" (Student #92).

"Make the topics more interesting. We always do the facts and nothing else in History" (Student #129).

"We could move on to harder work" (Student #18).

"The amount of time given to finish an activity is too much" (Student #30).

"Vary the teaching methods" (Student #188).

The open-response items contributed significantly to the understanding of the students' perception of the classroom climate and focus. The comments made were specific to the cognitive and affective factors identified by Steele (1981).

Summary of background variables with classroom climate

The findings of this study support the four background variables associated with the classroom climate found by Hansen and Feldhusen (1994). The significant associations between the six background variables and classroom climate (see Table 5.18) provide an answer to research question four. Training in gifted education, employing grouping practices, teachers' satisfaction with their job, support for gifted education programs and practices, type of school and years of regular teaching experience are all significant in promoting a positive classroom climate.

Classroom climate is further defined by Heller (1999) when he labels it a 'learning environment'. He extends the classroom climate to include catalysts found in both the proposed model and Gagné's (1995) differentiated model of giftedness and talent. Heller (1999) states that the distinguishing characteristic of a successful learning environment is a successful and flexible teacher of the gifted. Flexibility is found in an accepting approach to individuals and their needs and by assuming a positive attitude (Heller, 1999).

With a change in the paradigm dictating specialised services for gifted education over the last ten years, it has been evident that less financial resources have been assigned to supporting the practices of gifted education from government departments of education in the United States (Gallagher, 2000). This has prompted a need for the gifted specialist to form a strong link with the regular classroom teacher and the curriculum to continue the provisions for the gifted and talented student (VanTassel-Baska, 1991). Through an exploration of the potential use of special education principles to promote and plan gifted programs, and to train school personnel in the needs of gifted students, the shift away from gifted education and toward embracing the notion of special education means that the gifted child still has a voice in the regular classroom and curriculum that is being forced upon them (VanTassel-Baska, 1991).

6.6 SUMMARY

"Good teachers don't make students succeed, but enable them to...through motivation, planning and pedagogy" (Scheidecker & Freeman, 1999, p. 34).

The results of this study support the findings of the studies of 'expert' and 'novice' teachers by Hanninen (1988) and Silverman (1980). The results of this study also support Westberg (1994) who purported that effective teachers in schools displayed trust in the students to work independently, were spontaneous in their teaching practices and often exchanged teaching ideas and concepts with their network of gifted education colleagues. The findings of the present study demonstrate the need for teachers who work with gifted and talented children to maintain constant flexibility, reflection and caring with their teaching as these are essential for real learning to take place.

The teacher must adopt alternate ways of thinking, behaving and learning as found by Feldhusen and Kennedy's (1989) assessment of the teachers' own perception of their teaching skills and competencies. Sixty-two percent of the teachers felt that their experience in teaching the gifted classes had improved their teaching skills in the regular classroom (Feldhusen and Kennedy, 1989). It must be noted here that all the teachers involved in this study had some inservice professional development in identifying and teaching the gifted student.

Gross (1994c) found that teachers (on entering COGE) held a more positive attitude toward the practices and provisions for gifted students than the *trainees'* professional colleagues who did not choose training. Over the course of COGE, the *trainees* reported that their opposition to ability grouping and acceleration

declined significantly (Gross, 1994c). The *trainees* also reported that their confidence was enhanced as a result of the training program and they were “empowered as teachers and advocates” of gifted students (Gross, 1994c, p.15). The results of the present study support the findings of Gross (1994c) as the *trainees* in this study (most of whom were undertaking COGE) displayed teaching skills and classroom climates more like their *trained* associates than the *untrained* teachers in the study.

This is critical now, as the 2001 Senate Committee of Inquiry on the education of gifted children has made a recommendation regarding mandatory training for pre-service teachers and appropriate training and placement for teachers who have specific responsibility for teaching gifted students in special settings. The adoption of this recommendation would assist in the continuation of specialised teacher training programs for pre-service and practicing teachers in Australia. How the recommendations contained in the report will impact on the education of gifted students in Australia, is yet to be realised. This will depend on the Senate’s response to the report by its Committee of Inquiry and the next Chapter provides further evidence in favour of mandatory specialised teacher training for teachers of gifted students.

CHAPTER 7

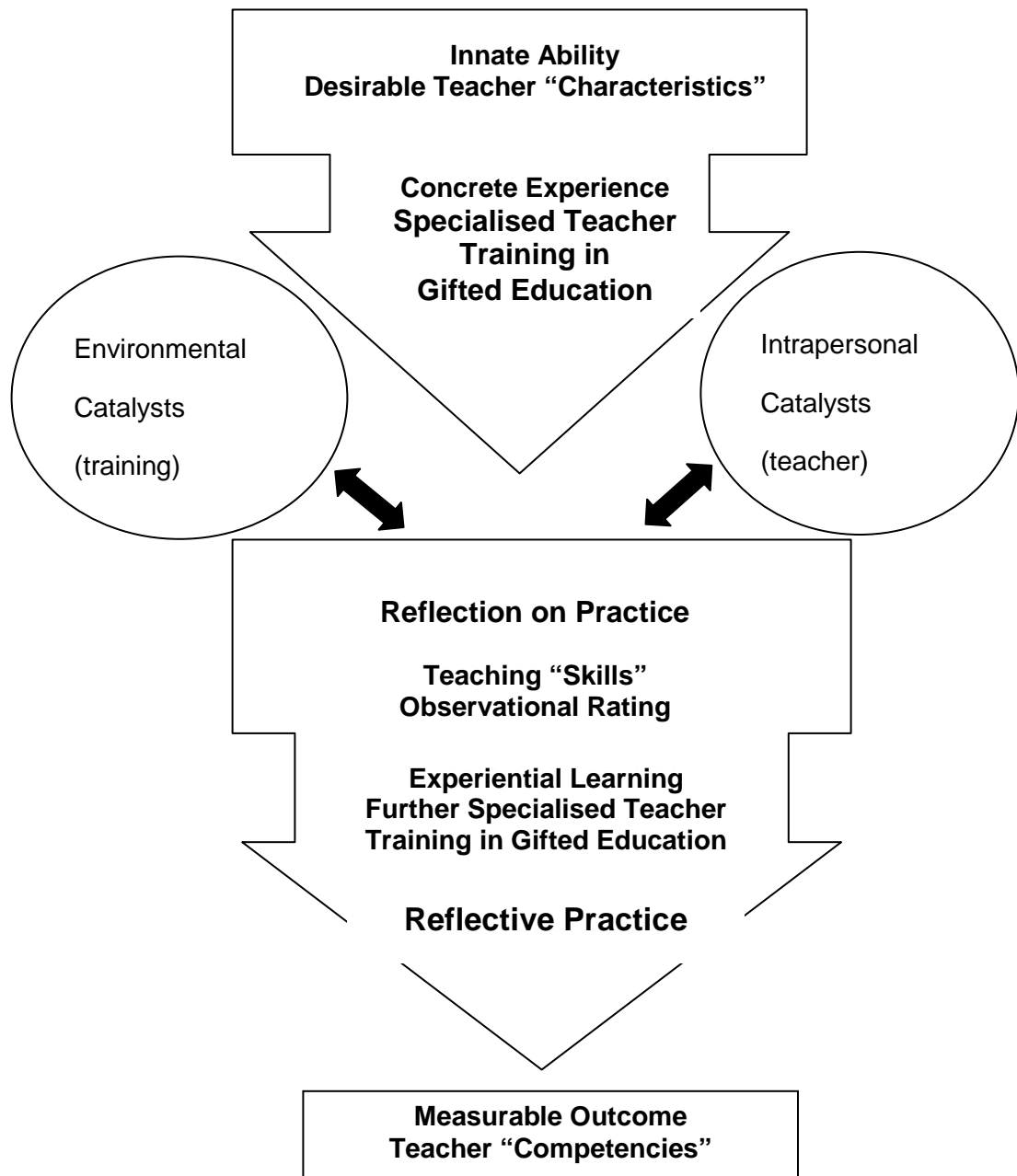
CONCLUSIONS, LIMITATIONS OF THE STUDY, RECOMMENDATIONS AND IMPLICATIONS FOR FUTURE RESEARCH

7.1 PROPOSED 'DEVELOPMENTAL' MODEL OF TEACHER EFFECTIVENESS

"Some human abilities can be grouped according to occupational fields (e.g. professions, crafts, arts and sports). The terms skills and competencies are commonly used to refer to such abilities" (Gagné, 1999, p. 111).

As detailed in section 2.3, the design of this study was influenced by Gagné's (1995) DMGT which proposed that an individual's potential in any area is translated into performance through the process of learning or training, and that this training is mediated by the influence of personality and environment. The present study has produced (as a product of the research) a model that combines the theoretical underpinning of Gagné's (1995) differentiated model of giftedness and talent with aspects of Lewin's (1951) experiential model of learning and includes the rationale of Schön's (1987) philosophy of the reflective practitioner. It is proposed that teaching skills can be enhanced through a developmental process of learning, training and practice.

**Figure 3: PROPOSED ‘DEVELOPMENTAL’ MODEL OF TEACHER
EFFECTIVENESS IN GIFTED EDUCATION**



The basic premise of the proposed 'developmental' model is that the natural teacher characteristics can be harnessed and transformed into measurable teaching performance through a *developmental* process of learning, training and practice.

The interaction of a cluster of *catalysts* such as motivation, environment and personality on the individual's ability to reason and reflect on their teaching practice is core to the functioning and the success of the training. Gagné's (1995) diagrammatic representation of his model is shown in section 2.3.

The proposed model, as a product of the present study, incorporates elements of Gagné's (1995) *developmental* process interacting on the cluster of various *catalysts* throughout the learning, training and practising phase to produce a measurable outcome. In fact, the importance of Gagné's (1995) differentiated model of giftedness and talent to this present study is centered around the *developmental* phase and the environmental and intrapersonal *catalysts*. By looking at the relationship between teacher characteristics and observed teacher competencies, it becomes apparent that appropriate training of teachers in the provision of gifted education is a vital component to an outcome of teacher effectiveness. For example, the collated teacher characteristics from Feldhusen and Hansen's (1994) analysis of the research from the past 30 years could be contained in the teacher characteristics that effective teachers of gifted students possess. Whereas, for example, the identified competencies of successful teachers of gifted and talented students as described by Hultgren and Seeley (1982) could be seen to represent the measurable outcome or competencies after systematic training in the developmental process. It is proposed, therefore, that

the *developmental* process and the impact of the various *catalysts* upon this process described in Gagné's (1995) model is pertinent to the realisation of teacher competencies when looking at effective teachers of gifted and talented students.

When developing a model as is proposed, it has to be acknowledged that some natural abilities are quite complex and may not be characteristics we consider as important when teaching specific groups of students. In fact, according to Maker (1975) some of these characteristics of effective teachers of the gifted are 'entering' characteristics that are natural aptitudes the teachers may have prior to any teacher training. It is for this reason that the lists suggested (as an example) for this proposed model are those compiled from an analysis of the research on teacher characteristics from the past 30 years as described by Feldhusen and Hansen (1994) and the stated competencies (as an example) are those found by Hultgren and Seeley (1982) research. It should be noted that the desirable teacher characteristics and competencies (as have been suggested here in this proposed model) may be seen as 'natural abilities' and 'developed skills' by some people and not by others.

Integrated into the proposed model is the concept of the teacher as an adult learner and their background experiences as an integral part of the training to become an effective teacher of gifted and talented students. The researchers in the field of adult learning (Schön, 1987; Knowles, 1984; Kolb 1984; Lewin, 1951; Rogers, 1977) encompass reflection and observation before, during and after the action and knowledge of teaching. Schön (1987) terms this reflection-*in*-action, reflection-*on*-action and reflection-*in*-knowledge and reflection-*on*-knowledge. A

detailed exploration of Schön's (1987) reflective practice is found in Chapter Two (section 2.2) and Chapter Three (section 3.3).

Kolb (1984) devised a comprehensive model of experiential learning which shows learning to produce a different transformation depending on how the individual deals with the knowledge of a particular subject. Combining this concept of learning based on background experiences with Schön's (1987) dictum of reflective practice denotes a holistic approach to learning, training and practising. Lewin's (1951) concept of experiential learning (see page 53) assists this proposed model by acknowledging the relationship between concrete experiences and how they are developed through observation and reflection. Lewin (1951) noted that it is only through this process of reflection that the concrete experience can be built upon and used as a foundation to further develop generalisations into a hypothesis and followed by testing of a new concept.

Thus, the development of a skill through the enhancement of a previously learned or natural ability commences and, through this process, professional growth occurs. Significant in this process is the understanding of the role that *reflection* plays upon the various *catalysts* as determined by the individual's environment, personality, motivation and 'others' (Gagné, 1995).

It was from an exploration of Gagné's (1995) model that the foundations of the aforementioned 'developmental' model of teacher effectiveness as a product of the present study were made. The key elements of the learning, training and practising continuum, along with the various stated *catalysts*, play a vital role in the development of teachers who are seen as effective practitioners for gifted and

talented students. Incorporated into this proposed 'developmental' model of teacher effectiveness are the elements of reflection, according to Schön's (1987) reflective practitioner, observation and experiential learning (Lewin, 1951) that are all seen to contribute positively to the development of a teacher's competencies.

It is reported by researchers (e.g. Brookfield, 1988; Dettmer & Landrum, 1998, etc.) that some educators rely heavily upon their pre-service teacher training to provide the resources for a lifetime of experiences in teaching. Commonly, teachers report that demands upon their time are exhaustive and that professional development or training is 'extra' work and unachievable. Many teachers, however, seek out and enthusiastically embrace professional development and perhaps these are the teachers who possess the natural abilities that are required to be trained and to produce the competency (performance) as an effective teacher of gifted and talented students.

7.2 APPLYING THE 'DEVELOPMENTAL' MODEL FOR TEACHER TRAINING IN GIFTED EDUCATION

"Good teachers don't make students succeed, but enable them to...through motivation, planning and pedagogy" (Scheidecker & Freeman, 1999, p. 34).

As a result of this study, certain conclusions were apparent. A theoretical framework for a proposed 'developmental' model of specialised teacher training for teachers of gifted students was one of the conclusions of the study. Through the identification of desirable teacher characteristics as the 'potential' and the teacher competencies as the 'performance', the *TOF* and *CAQ* measured the effectiveness

of the teacher training. It is important here to acknowledge, once again, that the participants were not randomly selected and the potential for volunteer bias is a weakness of the study and needs to be reflected in the conclusions presented here.

As mentioned earlier, the design of the proposed model was influenced by elements of Gagné's (1995) DMGT with a focus on the systematic developmental process (the learning, training and practice) and the positive and negative interactions of the various environmental and intrapersonal catalysts throughout the developmental process. Gagné's (1995) DMGT proposes that an individual's potential in any area is translated into performance through the process of learning or training and that this training is mediated by the influence of personality and environment. The proposed 'developmental' model, as a product of this study, is, in fact, centered on the *developmental* phase and its *catalysts*.

By investigating the relationship between teacher characteristics, observed teaching skills and teacher competencies, it is apparent that specialised training of teachers in gifted education is an essential component. The findings of the study provided evidence of the theoretical framework for the proposed model and supported the research literature on specialised training of teachers in gifted education. Thus, those *trained* and *undertaking training* were significantly more successful teachers than the *untrained* – which may indicate the effectiveness of COGE and M.Ed. specialised teacher training programs at UNSW. Gross (1994c) found that teachers, upon entering COGE, had a positive attitude toward the educational programs and provisions for gifted learners. At the end of the training, teachers (n=67) reported that their attitude towards this group of students had

become more positive – which may demonstrate a strength of the UNSW training program. It was not apparent in the findings of the present study as to what were potential weaknesses in the UNSW COGE and M.Ed. programs – however, it must be acknowledged that there are perhaps weaknesses in these specialised training programs for teachers of the gifted. One important factor in the findings of the present study was the inequivalence of groups in the sample. The students selected to survey were not randomly selected, and perhaps the teachers chose these students, as they were high student achievers. Therefore, it must be acknowledged that students' achievement may also be a component to the success of the *trained* and *trainee* teachers and not only the UNSW teacher training programs.

As mentioned in Chapter One, according to Gagné's DMGT, the teacher is an important environmental *catalyst* and can interact positively and /or negatively on the *developmental* continuum of the students' training, learning and practice into a talent. The results of this study provided more evidence, therefore, what was already stated in the research and that is that the teacher is not neutral to the process of the talent development of a gifted student. Furthermore, the findings of this study have lent support for the research suggesting that specialised training in gifted education assists the teacher in becoming someone who contributes *more* positively to the expression of talent by the gifted and talented student.

As previously noted, the collated teacher characteristics from Feldhusen and Hansen's (1994) analysis of the research from the past 30 years could be contained in the teacher characteristics that *trainee* teachers of gifted students show as 'entering' (Maker, 1975) characteristics. Desirable teacher characteristics

such as flexibility, enthusiasm, self-confidence, high intelligence, appreciation of giftedness, ability to foster higher level thinking and problem solving and a capacity to meet the personal and social needs of gifted students could be either natural or developed teacher characteristics. The impact of the specialised training in gifted education on both the *trainee* and *trained* groups of teachers in the present study provided evidence of how these 'entering' and desirable teacher characteristics (the 'potential') may have been turned into teacher competencies (the 'performance') through the specialised training, practical application of the theory, reflection on their knowledge and practice and concrete observation. It is the remarkable finding of this study that the *trainees* were as competent as the *trained* group showing that the impact of the developmental process with the intrapersonal and environmental catalysts was significant.

The identified competencies of successful teachers of gifted and talented students as described by Hultgren and Seeley (1982) can be seen to represent the measurable outcome or competencies after systematic training in the developmental process. The competencies identified by Hultgren and Seeley (1982) are knowledge of nature and affective/psychological needs of gifted students; ability to develop methods and materials for use with gifted students; skill in promoting higher-level thinking abilities and questioning techniques; supervised practical experience teaching a group of gifted students; skill in facilitating independent research and study skills; ability to develop creative problem solving skills; knowledge of approaches to extension and enrichment of subject areas; ability to construct and/or utilise identification procedures and knowledge of special affective and cognitive needs of the gifted underachiever. A close inspection of this list of competencies by Hultgren and Seeley (1982) shows a strong

relationship between the findings of the present study with these identified teacher competencies.

The training could impact on the existing teacher characteristics of the teacher of the gifted by enhancing the instructional climate and this, in turn, may transform the *trained* and *trainees'* potential into a performance as measured by the *TOF* and the *CAQ*. The training in gifted education can be seen as an environmental catalyst that has the ability to impact on personality and has the potential to produce a measurable outcome or 'performance' in teaching competencies.

The development of the proposed 'developmental' model incorporating catalysts that promote effective teaching skills and positive classroom climates for gifted students through the process of learning, training and reflection on the teacher's practice responded to the four research questions. The level of academic rigour expected in the gifted education subjects in the M.Ed. and COGE course content and assignments promoted solid learning, training and practice in the education of gifted students. The superiority of the *trainee* group in teaching skills has provided some evidence of the effectiveness of the training program and, therefore, the operationalisation of the proposed 'developmental' model. The measurable 'outcomes' or competencies of teachers with specialised training in gifted education may change as the goals of the teacher training program are modified to comply with educational demands (i.e. policies etc). Applying the proposed 'developmental' model to the existing UNSW teacher training (in gifted education) programs would currently be feasible. This is not to say that in the future, aspects of the proposed model would not need to be modified if the program goals change in accordance with educational initiatives (e.g. policy changes).

One of the weaknesses of the present study was that information on group differences in achievement between the students was not collected and perhaps student achievement (and other evidence of student learning) is a factor to be acknowledged in the claim for teacher effectiveness in this study.

Researchers in the field of adult learning (Schön, 1987; Knowles, 1984; Kolb 1984; and Lewin, 1951) encompass reflection and observation before, during and after teaching which Schön (1987) terms reflection-*in*-action, reflection-*on*-action, reflection-*in*-knowledge and reflection-*on*-knowledge. Lewin (1951) devised his experiential model of learning to show learning as a transformation according to how the individual processes particular knowledge. Combining this concept of learning based on background experiences with Schön's (1987) dictum of reflective practice denotes a holistic approach to learning, training and practice. Lewin's (1951) concept of experiential learning assisted the proposed model by acknowledging the relationship between concrete experiences and the development of the experience through observation and reflection. Thus, the development of a skill through the enhancement of a previous ability commences and, through this process, professional growth occurs (Gagné, 1995). Significant in this process is the understanding of the role that *reflection* plays upon the various *catalysts* as determined by the individual's environment and the impact on personality. Training is an environmental catalyst that also impacts on personality (located in the intrapersonal catalyst) as is evident by the significant results of this study.

7.3 CONCLUSIONS: RESPONSE TO RESEARCH QUESTIONS AND THE HYPOTHESES

"Sea level is the paradigm of mediocrity, and it is the physical nature of everything at rest to be drawn down toward it" (Scheidecker & Freeman, 1999, p. 49).

Teacher training in gifted education is "an imperative" if a teacher is to facilitate learning and to meet the individual needs of gifted students (Mönks, Heller & Passow, 2000, p. 846.). The results of this study provide evidence that teachers who pursue training in gifted education may demonstrate teaching skills that research has identified as particularly effective with gifted students, and have a more positive classroom climate than do teachers *untrained* in this field. Both pre-service and post-graduate specialised teacher training in gifted education should become a priority in Australia to increase the number of specialists in the education of the gifted and talented students in the nation's schools. Hansen in her 1988 study advocated specialised training of teachers in gifted education to ensure that the gifted and talented students receive appropriate instruction and that individual learning needs are met, and the findings of this Australian study, almost 15 years later, serve as a powerful endorsement.

Primarily, the key finding of this study is that the *trainee* group was as effective as the *trained* group - even though the *trainee* group had only completed half of their training. The acknowledgement, again, of pre-treatment differences, volunteer bias and [in] equivalence of groups used in the sample of the study is noted here. The impact of the specialised teacher training, by way of the Certificate of Gifted Education (COGE) and M.Ed. at UNSW, appeared such that the *trainees* demonstrated teaching skills and classroom climates at a level equal to their fully

trained colleagues after a substantial portion of the training was completed. As a direct result of the training, the *trainees* knew what they needed to know and were well equipped to implement programs, teaching practices and provisions for gifted students into the instructional climate. The actuality, therefore, of the adapted *Johari Window* (introduced in Chapter Four) is supported by these findings.

The academic rigour of the Certificate of Gifted Education (COGE) and M.Ed. programs at UNSW perhaps can be seen as an indication that significant improvement in teaching skills and classroom climate for gifted learners is possible. The findings of this study demonstrated how the course content material covered by the specialised training programs, together with the level of written academic assignments, may have impacted significantly on the teaching skills and classroom climates of the *trainee* teachers. It must be again acknowledged that volunteer bias and [in]equivalence of groups existed in the design of the research study. As no information was collected prior to participants initiating their specialised training in gifted education the study used a 'posttest only' design as it did not allow for a comparison of the groups before the treatment. Therefore, it can not be assumed that the only difference between the *trained* and *trainee* groups, and the *untrained* group, was training.

The findings of this study suggest that it would be prudent for administrators to allocate teachers who have specialised training in gifted education to teach the gifted and talented students in our schools. Similarities and differences between the research literature and this study have been discussed in the preceding Chapter and the conclusions outlined here expand upon how the findings of this study can impact on current gifted education pre-service teacher education and

current and future teaching practices in Australia. As this study was a quasi-replication of Hansen's (1988) study, it elaborated on her findings and lent further support for her final comment that *"...this study adds credibility to the argument that teachers of the gifted should have training in gifted education in order to develop necessary skills to teach gifted students"* (Hansen, 1988, p.92).

The missing component in the research literature was an evaluation of a model of specialised teacher training in gifted education that incorporated identified desirable characteristics and competencies of the teacher of gifted students so widely reported in the research literature of the past 50 years. The framework for this experimental study was outlined in Chapters One and Two along with the influence of Gagné's Differentiated Model of Giftedness and Talent (DMGT), Schön's (1987) reflective practitioner and Lewin's (1951) Experiential Learning Model. The theoretical underpinning of the study, presented here in the proposed 'developmental' model, described how the desirable teacher characteristics, combined with Gagné's *developmental* continuum of training, learning and practice, impacts with intrapersonal and environmental *catalysts*, reflection on practice and concrete experiences to provide the validated teaching competencies of an effective teacher of the gifted. Training, therefore, may be seen as a key *environmental catalyst* that impacts significantly on the teacher personally.

The aims of this study were outlined in the four research questions in Chapter One (page 14) and were responded to in Chapter Six. The questions focused on the differences between teachers *trained*, *untrained* and currently *undertaking training* in gifted education. The major results of this study show a significant relationship between training in gifted education and effective teaching skills and classroom

climate. The results also identified the psychological, demographic and experiential variables associated with teaching skills and classroom climate. In fact, the results provided very useful information about the effectiveness of specialised teacher training in gifted education in Australia. As a result of the findings, the following four hypotheses were rejected:

Hypothesis One

Teacher training in gifted education has no significant effect on observable teaching skills. This hypothesis was rejected as the results of the study show that the *trained* and *trainee* teachers demonstrated significantly greater teaching skills than the *untrained* teachers.

Hypothesis Two

Teacher training in gifted education has no significant effect on class climate. This hypothesis was rejected as the results of the study show that the *trained* and *trainee* teachers demonstrated significantly more positive classroom climates than the *untrained* teachers.

Hypothesis Three

No psychological, demographic or experiential variables are correlated significantly with observable teaching skills. This hypothesis was rejected as the results of the study shows significant correlations between teaching skills and training in gifted education, support for programming for gifted students, satisfaction with current position, year level taught, number of years teaching experience with gifted students, undergraduate average grade and type of program taught.

Hypothesis Four

No psychological, demographic or experiential variables are correlated significantly with class climate. This hypothesis was rejected as the results of the study shows significant correlations between classroom climate and training in gifted education, support for programming for gifted students, satisfaction with current position, year level taught, number of years regular teaching experience and type of program taught.

This study has provided evidence that teaching skills can be used in the classroom to promote learning and in highlighting the teacher competencies that create a positive classroom climate. Moreover, the results of the study highlight the interrelationships between background variables and teaching skills and classroom climate. These findings should make a notable contribution to the literature and provide support for the recommendations of the 2001 Senate Employment, Workplace Relations, Small Business and Education Committee (referred to as The Committee of Inquiry) on the education of gifted children discussed in Chapters Three, Six and in the recommendations for future research in this Chapter. As previously stated, the 2001 Senate Committee of Inquiry report included, amongst the 20 recommendations, that more effective training and inservicing of teachers in gifted education should occur. In fact, recommendation 16 says, *"State and Territory education authorities should require that teachers in selective schools and classes have suitable gifted education qualifications. The authorities should ensure that the necessary professional development is available. The Commonwealth should support this through the Quality Teacher Program"* (The 2001 Report of the Senate Employment, Workplace Relations, Small Business and Education Committee, p. 98). The adoption of this recommendation

by the Commonwealth should assist in the continued implementation of specialised and academically appropriate teacher training programs in Australia in the future.

The results of this study revealed that the teachers who receive *training* in gifted education appear to be significantly more able to create a more positive classroom climate than teachers who are *untrained*. The classroom climate is determined, in part, by the established learning environment for a gifted student. As mentioned, issues relating to volunteer bias and selection of the sample in the student population must be acknowledged when reviewing the conclusions drawn from the results of this study. The results indicated that classroom climate appeared to be strongly influenced by the teaching skills implemented, how the learning was facilitated and the ability to meet individual learning needs. The environment in which these students learn must present creativity, risk taking, passion and tolerance of individual learning paths chosen by the students (Duwell & Bennet, 2000). The ability of the teacher of the gifted to facilitate learning within an evolving learning environment can be assisted through the acquisition of effective teaching skills in the specialised teacher training programs.

The synthesis of research on teacher effectiveness by O'Neill (1988) was reviewed in Chapter Three and the findings of this study provided support for the reported instructional research factors on teaching effectiveness. As noted in Chapter Three, O'Neill (1988) divides the factors of teacher effectiveness into three stages. The first stage (preactive stage), listed learning environment, teacher knowledge, teacher organisation and curricular materials as factors relevant to teacher effectiveness (O'Neill, 1988). Stage 2, (interactive stage), included: teacher expectation; teacher enthusiasm; classroom climate; classroom management;

teacher clarity; advance organisers; instructional mode; questioning level; direct instruction; time on task; variability; monitoring and teacher flexibility. The final stage (postactive stage) included feedback; teacher praise and teacher criticism. The teacher *trained* or *undertaking training* in gifted education demonstrated effective teaching through these three stages. The results of this study support O'Neill's three listed stages of teacher effectiveness because a majority of his factors were indeed identified factors of the *trainee* and *trained* teachers' teaching skills and classroom climates according to the results of the *Teacher Observation Form (TOF)* and *Class Activities Questionnaire (CAQ)*.

Chapter One introduced the concept of teacher effectiveness as being based on the perception of the student's achievement. The results of the *Class Activities Questionnaire (CAQ)* in this study were collected from student perceptions of the classroom climate and support that the *trained* and *trainee* teachers were significantly more effective in creating a positive classroom climate than the *untrained* teachers. Many of the students' responses are based on their assessment of how well they have performed academically with the teacher. This study has provided clear evidence that the *trained* and *trainee* teachers' classrooms had a more positive instructional climate than the *untrained* teachers.

7.4 LIMITATIONS OF THE STUDY

"The Seeley and Hultgren research indicated that more than three fourths of university program directors and practitioners in gifted education believed all professionally trained and certified teachers should have exposure to education of the gifted" (Seeley, 1989, p.286).

The reasons why teachers emerge from specialised teacher training with more effective teaching skills are well documented in the findings of this study and many others (Baldwin, 1993; Batten et al., 1993; Cashion & Sullenger, 2000; Hansen, 1988; Hansen & Feldhusen, 1994; Ryser & Johnsen, 1996; Seeley, 1989; Whitlock & DuCette, 1989). Some features of the study, however, require further discussion with regard to the study's limitations.

The difficulties associated with finding participants for this study were outlined in Chapter Four. The participants were categorised according to the level of training (the treatment in the experiment) and teachers were eligible to participate only if they had five gifted students in their class. Pre-treatment differences in the sample used in the present study were not determined by demographic information collected. Non-random sampling and the random assignment of participants to treatments becomes troublesome when working with an intact group such as the teachers trained in gifted education. The result was a lack of equivalent groups. The results may have been affected, partly as a consequence of the difficulty in acquiring participants as events chronicled in Chapter Four, and partly because the number of participants in the sample was lower than anticipated – particularly in the *trainee* group. However, steps in the data analysis were taken to ensure that the data and the analysis of those data collected was reliable.

There was the potential for bias in the observational data collected as the raters were not randomly selected and as the population involved in gifted education in NSW and the ACT is relatively small, the raters may have known the teachers they were observing. This lack of anonymity may have influenced the observation and may have affected rater reliability. As Rater 1 was responsible for a greater percentage of observations than the other six raters, a potential for skewed inter-rater reliability is also a potential concern to be acknowledged.

The *Class Activities Questionnaire (CAQ)* was a self-reported questionnaire and, so, procedures were employed to reduce the amount of reporting bias. These procedures included written statements (open response) on the questionnaire and anonymity on the survey sheet. It is possible that the collected responses of the *Class Activities Questionnaire (CAQ)* provided only a static snapshot of the classroom climate; however, the open-response data corresponded accurately to the current outlook of the students' perspective of the classroom climate as reported in the checked items on the survey. The potential bias of a self-reporting questionnaire, and the inability to control for such measures of bias, is a concern in the findings and must be acknowledged here.

Generalisability difficulties and issues can occur when the findings of qualitative data are inconsistent because of the sample selection procedure (for example, *untrained* as well as *trained* and *trainee* teachers were asked to identify the gifted students who completed the CAQ) and they may not have been aware that they indeed had gifted students in their classes. As the identification procedures at each school varied, it was difficult to adhere to standard sampling procedures and

this precluded random sampling techniques. Perhaps a stronger test of the benefits potentially derivable from the explicit objectives of this study could be obtained if a standardised identification procedure of gifted and talented students was employed in all schools.

The sample selection procedures for the *untrained* teachers was, therefore, not consistent because the *untrained* teachers had not experienced the "treatment" (that is, training in gifted education) and so may have not employed standardised identification procedures as determined by the *1991 NSW Strategy for the Education of Gifted and Talented Students*.

7.5 RECOMMENDATIONS FOR FUTURE RESEARCH

"Specialised teachers are more sensitive to the needs of gifted students and the achievements of their students may be more impressive. As the...21st century nears, continued advocacy and support for quality standards for teachers of gifted and talented students must be emphasised" (Karnes & Whorton, 1996, pp. 55 & 56).

As reported in the preceding Chapter, Hansen (1988) identified items 5, 12, 6 and 10 on the *TOF* as having the highest potency while this study found items 2, 3, 9 and 10 ranked highest. Only item 10 was found in the top four of both studies. Table 6.1 showed the research studies that supported the importance of the four highest ranked variables examined on the *Teacher Observation Form* and, as all items were found to be significant, the ranking did not affect the result and does not warrant further investigation in this study. It would be interesting, however for future research, to investigate whether a cultural difference or a difference perhaps in training standards could be the cause of the difference in ranking.

Hansen (1988) found item 5 (self-determination of activities by students) to be the strongest in her comparison of *trained* and *untrained* teachers. Conversely, Feldhusen and Huffman (1988) found this item to be rated the second lowest and it was not in the top four items of the present study. However, as the findings of teaching skills between the *trained*, *trainee* and *untrained* teacher were significant in the present study, this difference does not warrant further investigation at this stage but, again, would be an interesting avenue of further study. As item 6 (variety of classroom experiences) was the only item found with significant differences between the *trained* and the *trainee* groups it is worthy also of further investigation. Is the *trainee* teacher as skilled at teaching gifted students as the *trained* teachers? Whether or not there was a difference between the *trainee* and the *trained* groups has been answered by the results of this study - the *trainee* teachers were not significantly different to their *trained* counterparts in teaching skills and classroom climate.

Perhaps the explanation of the *trained*, *trainee* and *untrained* teachers through the *Johari Window* in Chapter Four attempts to address this issue. It would appear, however, that the *trainees* were not as successful at providing a variety of experiences (item 6 on the *TOF*) for their students as the *trained* teachers. This could be because the *trainees* did not have equal experience in teaching the gifted students as the *trained* teachers and this is, therefore, worthy of further research. Perhaps it was that this particular teaching skill had not yet been covered in the *trainees* training program.

Another project could be to survey all students in a range of mixed ability classrooms, using the *Class Activities Questionnaire (CAQ)*, and to compare the results from the gifted students with those students who were of average ability. These responses could also be compared using the variable of training for the teacher.

The findings of the present study suggest several avenues for future research relating to the training of teachers in gifted education. A future project could be to assess the teacher's years of experience working with gifted students after the completion of training and to measure whether the teacher's effectiveness was enhanced by the post-training experience.

Teachers in training could be interviewed about their perception of the outcomes and goals of the specialised training programs in gifted education. For example, the *trainees* could be interviewed regarding their changes in perception of themselves as a learner and as a facilitator of learning for gifted students.

Future research may also benefit from specific attention paid to the homogeneously grouped students in rural areas. The research could focus on a comparison of rural, urban and suburban learning environments in an endeavour to differentiate between classroom climates in different populations and settings. As rural schools in Australia often contain very small student populations, a comparison study of the students' perceptions of the classroom climate would provide valuable insights into these distinctive learning environments.

A longitudinal study of *trained* teachers one, two and five years after training would be an interesting avenue for future research. The investigation could include whether the *trained* teachers continued to make major changes to their classroom practice in their first year and what 'other' accomplishments (for example, writing policies, seeking promotion to a Gifted and Talented Coordinator's position) they may have achieved in their second year after completing the training. The investigation in the fifth year may follow-up changes made to classroom practice, their current career and teaching position and whether there were factors that encouraged or discouraged these teachers in their pursuit of gifted education practices.

Finally, considering the significance of the effect of training in gifted education on teaching skills and classroom climate that was found in this study, it would also be pertinent to engage in a study of *untrained* teachers teaching gifted students. The purpose would be to monitor how many intended to pursue training in gifted education, what was the specific incident that prompted their decision to commence training in gifted education and if, in fact, they actually began and subsequently completed the training.

7.6 IMPLICATIONS FOR PROFESSIONAL PRACTICE

"The best teachers of gifted students are those with specific training in gifted education and who have certain characteristics" (Rogers, 2002, p. 16).

The study has implications for future research both in the theory and the practice of how teachers are specially trained and in how they are allocated to schools to teach gifted students in special programs. The proposed theoretical model presented in Section 7.1 has a practical application as it defined a given desirable set of characteristics and included room for teacher's experiential background, reflection on their teaching and incorporated the developmental process that advocates specialised teacher training to produce the competencies required to work with gifted students. The proposed model, therefore, lent support to the developmental and theoretical understandings of the nature of teacher characteristics, desirable competencies, the process of specialised teacher training and the use of reflection during teaching to produce an effective teacher of the gifted.

Teacher training options that offer specialised training in gifted education are available in many countries. Such a mixture of programs and offerings indicate that a range of standards of training may also exist. Some teacher training programs encompass program goals that reflect the research detailed in Chapter Three, and are supported by the data analyses outlined in Chapter Five. Many teacher training programs, however, fail to achieve the total curricular experience and only consider one aspect, the teaching and learning (Heller, Mönks & Passow,

2000). In fact, here in Australia, the few post-graduate teacher training programs in gifted education that are offered in universities vary greatly in academic rigour, class contact hours and assessment expectations.

The fact that specialised teacher training courses in gifted education are not compulsory in pre-service teacher education seems ironic when there are research studies and literature supporting the outcomes of these teacher training programs. Why would these programs exist if they do not make a difference to the education of gifted and talented students and why would teachers seek training if there is no need for it? The continued need for specialised training in teaching gifted and talented students is apparent as the identification processes, and general understanding of the needs of these students, is often misunderstood by educators, teaching faculties and the government public education policy makers.

The need for mandatory teacher training in gifted education

This study has provided evidence that teachers who are *trained* in gifted education, or who have completed a substantial proportion of their training, demonstrate more effective teaching skills and have a more positive classroom climate than the *untrained* teachers of the gifted. The evidence provided by the results of this study, which validated earlier studies, supports the mandatory training of teachers in gifted education at both pre-service and post-graduate level. As stated earlier, Feldhusen's (1985) summary of the literature on desirable teacher characteristics advocated that the extensive published lists of desirable teaching skills and competencies should become the goals of specialised teacher training programs for teachers of the gifted. Teacher educators in several tertiary institutions in the United States, and a few tertiary institutions in Australia, have successfully

developed programs to facilitate learning of identified, effective teaching skills and desired competencies at both the pre-service and post-graduate level. It is recommended that the findings of this study be used to support teacher education programs as a part of the core curriculum in pre-service, tertiary-level teacher education programs around Australia.

In fact, as mentioned earlier, teacher training is a feature underlying five of the 20 recommendations on the education of the gifted the 2001 Senate Committee of Inquiry Report. Recommendation 14 says *"...that state and territory education authorities should require, as a condition of employment, that newly post-graduated teachers have at least a semester unit on the special needs of gifted children in their degrees. This should include training in the identification of gifted children and the pedagogy of teaching them"* (The 2001 Report of the Senate Employment, Workplace Relations, Small Business and Education Committee, p. 96). If this recommendation is adopted then the impact on the education of gifted students in Australia should be as discernible as pre-service teacher education will include compulsory specialised teacher training in gifted education.

To assist with developing further the post-graduate training opportunities for teachers, recommendation 13 states *..."That the Commonwealth should fund targeted postgraduate places for gifted education studies"* (The 2001 Report of the Senate Employment, Workplace Relations, Small Business and Education Committee, p. 90). The continued need for specialised teacher training in gifted education is supported by the results of this study.

From a practical perspective, the findings of this study suggested that certification guidelines might be established to decide who should be authorised to teach gifted and talented students. Endorsement and certification is vital so that administrators allocate teachers who have specialised training in teaching gifted and talented students to be appointed to such positions (for example in primary Opportunity Classes and Selective High Schools). For teachers who want to teach gifted and talented students, the findings of this study advocate undertaking training in gifted education to provide them with the appropriate skills. Thus, the findings of the study make it possible to consider the implications of the theoretical model of training to be substantiated in two ways - firstly in the specialised training of pre-service teachers and in the professional development of currently practicing teachers to provide more effective teaching skills and classroom climates for the gifted and talented students in Australian classrooms.

The 1991 *NSW Strategy for the Education of Gifted and Talented Students* acknowledged that provisions and programs for this group of students are desirable. Taking this one step further would lead the policy makers to determine that certification requirements assure parents, students and administrators that teachers meet the minimum standards of training in gifted education. The argument supporting the placement of teachers with special training in gifted education to teach the gifted has been proven by the United States having endorsement requirements for teachers of gifted students in 28 of the 50 states (Karnes, Stephens & Whorton, 2000).

Good teaching skills and competencies, grounded in reflective practice, can enliven instruction and improve students' knowledge, reasoning and higher-level thinking skills. When teachers share direction with the students of how something should be done, everyone in the learning environment is on an equal playing field of expectations and standards. Every child deserves an effective teacher and quality teacher training programs in gifted education assist teachers in developing the identified teaching skills necessary to be an effective teacher of the gifted and talented student.

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APPENDIX A

Participant Information Form (PIF) Instrument

Gifted Education Teacher Observation Project
PARTICIPANT INFORMATION QUESTIONNAIRE

Please complete the following information:

Name: _____

Sex: Tick please (✓) Male ☐ Female ☐

Home Address:

Postcode

Telephone: home _____ work _____ fax _____

School Address:

Postcode

Position held:

Preferred observation time and day:

Please answer the following questions by marking the appropriate responses:

1. Circle (O) the Year level you will teach for the observation:

K	1	2	3	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	---	----	----	----

2. Tick (✓) the type of program in which you will teach:

Mixed ability ☐ self-contained gifted group ☐

pull-out program ☐ subject acceleration ☐

year acceleration ☐ whole class enrichment ☐

3. As of January 1, 1996, circle the total number of years you have been a teacher (any level K-12, in any school - government, non-government or catholic systems):

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	20+			

4. As of January 1, 1996, circle the total number of years you have been a teacher of gifted students: Please tick (✓) Full-time ☐ Part-time ☐

1	2	3	4	5	6	7	8	9	10	11	12
	13	14	15	16	17	18	19	20	20+		

5. Please indicate in hours the number of class contact time per week you have with gifted students: _____ hours per week.

6. What is the approximate size of the school in which you teach:
(total K-12 enrolment if applicable) _____

7. Gifted Education Subjects completed: (if applicable)

Session & Year	Name of Subject	Institution	Grade

Name and year of Award: _____

8. If less than two (2) gifted education subjects completed, do you intend to pursue training in Gifted Education? Please tick (✓): Yes ☐ No ☐9. If known, please give your HSC (or equivalent) mark:
(ie the total mark out of 500, 700, TER score etc) _____10. Please give your undergraduate average grade level:
(ie a pass, credit, distinction or high distinction average) _____

Please answer the following by ticking (✓) the most appropriate response:

11. I support educational programming for the gifted:
 strongly agree ☐ disagree ☐ undecided ☐
 agree ☐ strongly disagree ☐

12. I am satisfied with my position now as a teacher:
 strongly agree ☐ disagree ☐ undecided ☐
 agree ☐ strongly disagree ☐

13. I am currently teaching in my teaching subject area:
 Yes ☐ No ☐

THANK-YOU!

APPENDIX B

Teacher Observation Form (TOF) Instrument

PURDUE UNIVERSITY GIFTED EDUCATION RESEARCH INSTITUTE
Teacher Observation Form (TOF) adapted by Jennifer Rowley 1996

Teacher _____ Date _____
 Class/year/group _____ Time _____ to _____
 School _____
 Rater's name/s _____

INSTRUCTIONS: There are 12 categories listed below. Each category contains a number of criteria. Rank each category using the rating scale opposite, when one or more of the criteria listed is observed. Please ✓ (tick) criteria if observed. If no criteria are observed, mark the n/o box.

1. Subject matter coverage
 - A Depth and breadth
 - B Concept orientation
 - C Teacher expertise
2. Clarity of teaching
 - A Verbal communication skills
 - B Non-verbal communication skills
 - C Clear and specific directions
 - D All necessary points dealt with
 - E Sufficient illustrations and examples
 - F Student comprehension as evidenced by responses/involvement
3. Motivational techniques
 - A Teacher energy and enthusiasm
 - B Variety
 - C Student enthusiasm
4. Pace of instruction
 - A Individualised needs accommodated
 - B Appropriate for the group
 - C Avoidance of unnecessary repetition, drill, use of examples
5. Opportunity for self-determination of activities by student
 - A In classroom situation
 - B In homework
6. Student involvement in a variety of experiences
 - A Discussions, small group activities, video, learning centre, etc.
 - B Purposeful use of movement (learning styles accommodated)
 - C Creative thinking, problem solving, independent study process

Rating Scale

- 5 - Outstanding
 4 - High
 3 - Average
 2 - Needs some improvement
 1 - Not satisfactory
 n/o - not observed
- ✓ - Criteria Observed
 -- - Criteria not observed

Tick if teacher would like feedback from Jennifer

7. Interaction between teacher and student, student and peers, is appropriate to lesson objectives
 - A Activities that promote group learning
 - B Respect for individuals and their ideas
 - C Creative thinking, problem solving, independent study process
8. Opportunity for student follow-through for homework
 - A Open ended, allows for creativity, individual interest & pace
 - B Handouts clearly printed
 - C Instruction thoroughly given
 - D Encouragement of, and assistance in, further study for interested students
9. Emphasis on higher-level thinking skills
 - A Bloom's taxonomy evidenced in teacher questioning, activities, teaching aids
 - B Critical thinking
10. Emphasis on creativity
 - A Creative thinking skills (fluency, flexibility, originality)
 - B Accepting atmosphere
 - C Encouragement of risk taking
 - D Open ended questioning
11. Lesson plan designed well
 - A sense of planning with flexibility
 - B student-centred
12. Use of teaching and learning aids
 - A Inclusion of audio-visual materials, models, demos etc.
 - B Clearly printed and grammatically correct
 - C Appropriate/necessary

APPENDIX C

Class Activities Questionnaire (CAQ) Instrument

Teacher's Name _____ Subject _____
 School Name _____ Date _____

CLASS ACTIVITIES QUESTIONNAIRE (CAQ)

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adapted by Jennifer Rowley 1996

Please tick the following

I am Male ☐ Female ☐

My expected grade in this subject A ☐ B ☐ C ☐ D ☐ Fail ☐

Class Period 1st ☐ 2nd ☐ 3rd ☐ 4th ☐ 5th ☐ 6th ☐ 7th ☐ 8th ☐ 9th ☐

I am in Year 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐

DIRECTIONS: Decide how well each sentence fits your class.

Tick **SA** if you **strongly agree**

Tick **A** if you **agree**

Tick **D** if you **disagree**

Tick **SD** if you **strongly disagree**

DO NOT MARK

1	2	3	4	5
6	7	8	9	0
1	2	3	4	5
6	7	8	9	0
1	2	3	4	5
6	7	8	9	0
1	2	3	4	5
6	7	8	9	0
1	2	3	4	5
6	7	8	9	0
1	2	3	4	5
6	7	8	9	0
1	2	3	4	5
6	7	8	9	0

Base your answer on how well each sentence describes what is emphasised in your class
- what your teacher wants you to do. Tick ✓ only one answer for each.

	SA	A	D	SD
1. Learning many facts and definitions is the student's main task.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. An important activity is to make judgments of good/bad right/wrong and explain why.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Students actively put methods and ideas to use in new situations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Most class time is spent doing other things than listening.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. The class actively participates in discussions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Students are expected to go beyond the information given by the teacher.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Great importance is placed on logical reasoning and analysis.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. The student's task is to know the one best answer to each problem.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Restating ideas in your own words is often encouraged.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Great emphasis is placed on memorising.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Students are urged to build on what they have learned to produce something.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Using logic and researching processes to think through complicated problems (and prove the answer) is a major activity.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Students often role play situations to develop skill in using what they have learned.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Students are encouraged to independently explore and begin new activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. There is little opportunity for student participation in discussions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Students are expected to discover patterns and outcomes in the information studied.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Many points of view and solutions to problems are accepted in this class.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. This class provides much opportunity for students to get to know each other's thought.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Students are excited and involved with class activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. The student's task is to make many judgements about the how important issues and ideas are.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Great importance is placed on explaining and summarising what is presented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. There is a lot of emphasis placed on grades in this class.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Inventing, designing, composing, and creating are major activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Students do not enjoy the ideas studied in this class.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. There is very little joking or laughing in this class.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

26. On the average, the teacher talks now much of the time?
 A 90% ☐ B 75% ☐ C 60% ☐ D 40% ☐ E 25% ☐ F 10% ☐
27. On the average, how much time do you spend preparing for this class each week?
 A None ☐ B .5 hr ☐ C 1 hr ☐ D 1.5 hrs ☐ E 2 hrs ☐ F 2.5 hrs ☐
 G 3 hrs ☐ H 4 hrs ☐ I More than 5 hrs ☐
28. List the best things about this class from your point of view.
 1) _____
 2) _____
 3) _____
29. If you could change three things about the class, what would they be?
 1) _____
 2) _____
 3) _____
30. Comments. If you have comments, please write them below.

Thank you!

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 MANSFIELD CENTER, CT 06250

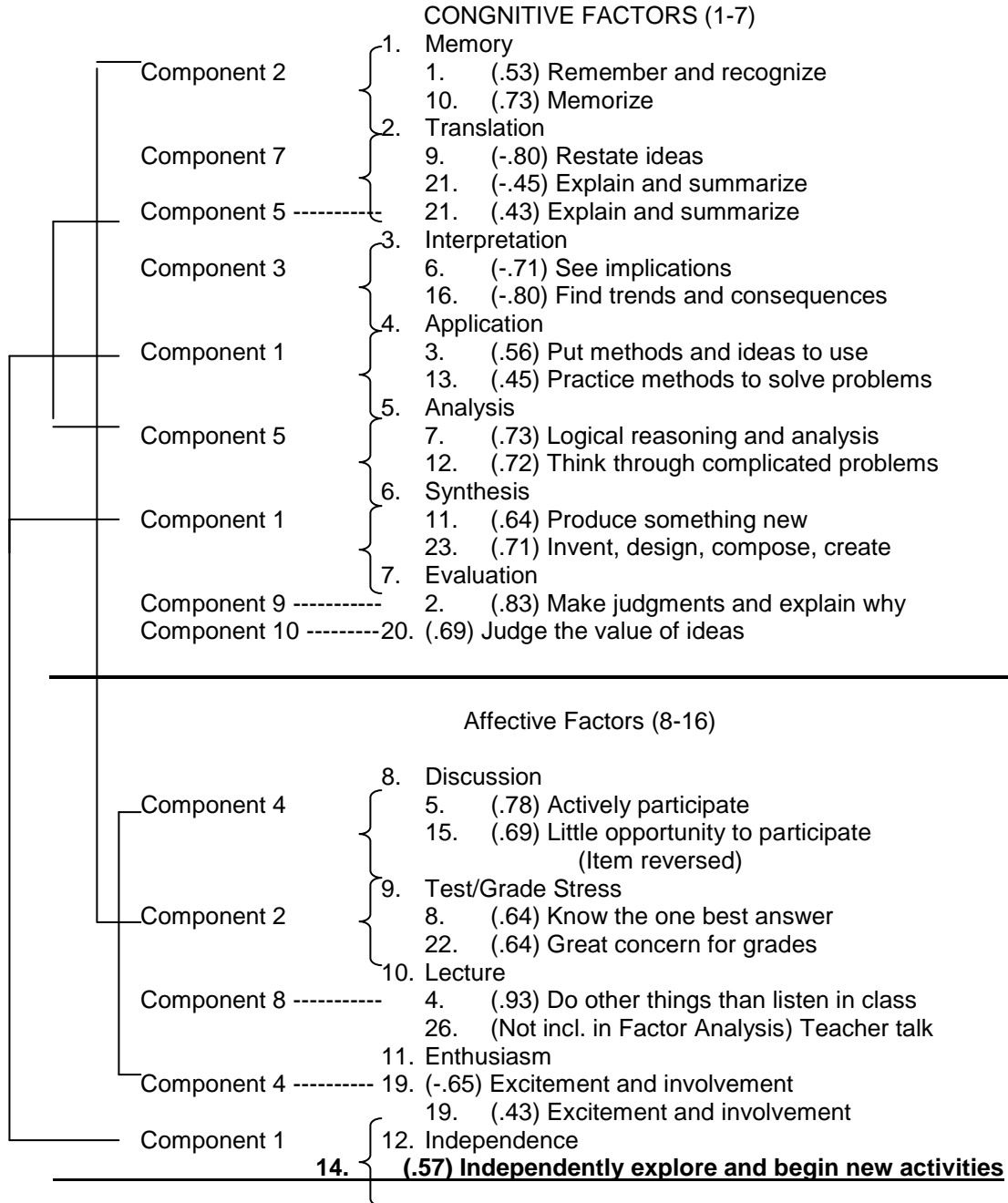
APPENDIX D

- (i) Steele's (1981) Factor Analysis for the Class Activities Questionnaire (CAQ) Instrument**
- (ii) Item total reliability for the Teacher Observation Form (TOF) Instrument**

Relationship of the Statistical Components and Logical Factors of the CAQ

Statistical
Components

Logical Factors and Paired Items
(Factor loadings and key words in item shown)



- 13. Divergence
 - 17. Discover many solutions
- 14. Humor
- Component 6 ----- 25. (.96) Jokes and laughter in class
- 15. Teacher talk
 - 26. (Not included in analysis)
- 16. Homework
 - 27. (Not included in analysis)

(Items 18 and 24 were dropped in final stages of field testing, but not deleted from the form of instrument used in data collection.)

from Steele (1981)

**Item-Total Correlation Coefficients for
the Class Activities Questionnaire**

Item		Item-Total Correlation Coefficient	Rank in Order of Highest Item-Total Correlation
23	Inventing, designing	.66****	1
18	Know other students	.65****	2
10	Emphasis on memorization	.60****	3
17	Many view are accepted	.60****	4
13	Simulation	.55****	5
14	Independently explore	.53****	6
19	Excited and involved	.53****	7
1	Learning facts and definitions	.48****	8
15	Discussion	.48****	9
5	Discussion	.48****	10
8	Know one best answer	.48****	11
3	Put ideas to use	.47****	12
24	Enjoyment of ideas	.47****	13
2	Make judgments	.47****	14
16	Discover trends	.43****	15
6	Go beyond information	.43***	16
20	Make judgments	.42****	17
16	Teacher talk-time	.40****	18
11	Produce something new	.38***	19
22	Concern for grades	.37***	20
25	Humor in class	.29*	21
4	Teacher talk-time	.28**	22
12	Use of logic	.26*	23
7	Use of logic	.25*	24
27	Time preparing for class	.23	25
21	Explaining	.13	26
9	Restating ideas	-.15	27

Alpha = .689

*p<.05

**p<.01

***p<.005

****p<.001

Correlation Matrix of Dimensions of the CAQ with Other CAQ Dimensions and with Total CAQ Scores

CAQ Dimension	Higher-Level Thought Processes	Focus	Climate	CAQ Total
Lower-Level Thought Processes	.17***	.49***	.18***	.53***
Higher-Level Thought Processes		.30***	.39***	.76***
Focus			.24***	.66***
Climate				.70***

***p<.001

**Item-Dimension Correlation Coefficients
for the Class Activities Questionnaire**

CAQ Dimension and Corresponding Items		Correlation of Item with Dimension 1	Correlation of Item with Dimension 2	Correlation of Item with Dimension 3	Correlation of Item with Dimension 4
<u>Lower-Level Thinking Processes – Dimension 1</u>		alpha = .75 (N=71)			
Item 1	63	.26	.45	.20	
9	.20	-.29	-.25	.05	
10	.84	.29	.61	.16	
21	.50	.02	.15	-.03	
<u>Higher-Level Thinking Processes – Dimension 2</u>		alpha = .75 (N=71)			
Item 2	.18	.65	.21	.51	
3	-.03	.40	.25	.52*	
6	.20	.47	.16	.29	
7	.12	.44	.02	.01	
11	.05	.45	.17	.20	
12	-.08	.52	-.05	.17	
13	.20	.63	.27	.26	
16	.04	.59	.12	.33	
20	.04	.65	.10	.15	
23	.17	.70	.40	.30	
<u>Focus – Dimension 3</u>		alpha = .62 (N=71)			
Item 4	.14	.15	.62	-.06	
5	.19	.43	.46	.09	
8	.58	.04	.69	.17	
15	.24	.30	.41	.35	
22	.45	.16	.71	.11	
26	.16	.18	.64	.70	
<u>Climate – Dimension 4</u>		alpha = -.09 (N=71)			
Item 14	.12	.58	.39	.17*	
17	.22	.60	.48	.14*	
19	.12	.41	.28	.41*	
27	-.05	.06	-.27	.75	
Items Not Included in Dimensions					
Item 18	.30	.51	.49	.26	
24	.15	.24	.37	.31	

* Item correlates with a dimension other than the one it is purported to measure

Item-Total Correlation Coefficients for the Teacher Observation Form

Item		Item-Total Correlation Coefficient	Rank in Order of Highest Correlation with Total TOF
5	Opportunity for self-determination of activities	.83***	1
6	Student involvement in a variety of experiences	.82***	2
1	Subject matter coverage	.79***	3
10	Emphasis on creativity	.74***	4
9	Emphasis on higher-level thinking skills	.71***	5
11	Lesson plans to meet objectives	.71***	6
8	Homework	.67***	7
4	Pace of instruction	.66***	8
12	Use of teaching and learning aids	.66***	9
2	Clarity of teaching	.65***	10
3	Motivational techniques	.65***	11
7	Interaction between teacher and student, student and peers	.64***	12

Alpha = .86

***p<.001

APPENDIX E

- (i) Correspondence (participants) - UNAVAILABLE**
- (ii) How and when participants gathered**

**Schedule of how and when participants
were gathered for the study**

Date	Contacted	Replies	Follow-up
March 1995	COGE and M.Ed. graduates Current 1995 COGE cohort	842 letters sent 81 replies 59 accepted	personal invitation at 1996 COGE plenary session
January 1996	1996 COGE cohort	48 letters sent 3 replies 0 accepted	letter and small gift for 1996 COGE cohort
April 1996	1996 COGE Cohort	48 letters sent 2 replies 0 accepted	letter and complimentary ticket to Gifted Education Seminar for 1996 COGE cohort
July 1996	1996 COGE Cohort COGE and M.Ed. graduates	168 letters sent 5 replies 5 accepted	telephone interview -random sample of 1996 COGE cohort
October 1996 and January 1997	1996 COGE Cohort COGE and M.Ed. graduates	389 letters sent 63 replies 49 accepted	letter and complimentary school inservice for 1996 COGE Cohort and COGE and M.Ed. graduates

APPENDIX F

(i) Interview schedule (telephone interview schedule)

Telephone Interview Schedule

- a) What was the main reason for not participating in the study?
- b) Would you have participated if there was an incentive (for example, money, a prize or a gift)
- c) If you were asked to have someone observe you teaching in a less formal environment (for example, a Sunday school class) would you have agreed?
- d) An assumption would be that people did not participate because demands on teachers are high (time, extra curricula, etc). Do you agree?

APPENDIX G

- (v) Correspondence (raters) - UNAVAILABLE**
- (vi) Rater questionnaire- UNAVAILABLE**
- (vii) Observation guidelines and protocol- UNAVAILABLE**
- (viii) Results of simulated teacher observation at the rater training sessions- UNAVAILABLE**

APPENDIX H

- (iii) Scree Diagram for the classroom climate results -
UNAVAILABLE**
- (iv) Frequency table for teacher observations (n=167)**

Frequency table for year level taught for the observation

Table: Frequency of year level taught for observation (n=167)

Year level	Trained n=56	Untrained n=80	Trainee n=31
Kindergarten	0	2	1
Year 1	0	1	2
Year 2	2	6	2
Year 3	1	4	5
Year 4	3	3	4
Year 5	6	5	3
Year 6	6	7	3
Year 7	5	6	2
Year 8	3	9	1
Year 9	3	6	1
Year 10	2	5	0
Year 11	1	6	0
Year 12	1	1	0
1/2	0	4	1
2/3	0	1	1
3/4	1	1	0
4/5	18	3	4
5/6	3	5	1
7/8	1	1	0
9/10	0	2	0
11/12	0	1	0